

Extraction of Processes from Laws: Annotation Guidelines

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December 2, 2022

Revision History

Revision	Date	Author(s)	Description
1.0	29.02.21	lopez@di.ku.dk	created
1.1	31.03.21	lopez@di.ku.dk	Added steps in annotation process, added summarization of annotation process, clarifying steps when adding activities/relations from DCR modeler

1 Introduction

Laws, norms, and other legislative documents establish sets of laws that relate events, decisions, rights, obligations and administrative/governmental roles. However, understanding the way such entities relate is a complex task, that requires manual reading and understanding of legal documents. Our main objective is that of support the legal practitioner in the comprehension and automation of laws, via a set of algorithms that can identify digitalizable norms.

An important aspect of natural language processing algorithms lies in the training phase. Algorithms need to be trained by human practitioners that understand the domain, syntax and semantics of the documents in question.

The main goal of this document is to *formalize* the annotation phase in laws, relating the annotations to semantic concepts in the DCR process modeling notation. We will explain process models in the DCR notation in Section 2. In order to provide a sound formalization, we need to identify what parts of a law can be digitalizable, that means, which parts of an administrative act have a corresponding formal component in DCR graphs. At the moment, only a small subset of directly contribute to process models. In this guide we will concentrate in identifying such elements.

This guideline describes the specific types of information that should be

identified for the process extraction tasks and provides examples similar to those found in legal documents. The instances that should be marked along with examples in the surrounding text that should be included in the annotation are provided. Instances marked in **blue** are correctly annotated concepts. Instances marked in **red** are wrongly annotated concepts, and therefore should not be marked.

The annotation guideline has been developed following examples from [1, 3, 10, 2]. In certain cases, we will recall concepts from law, linguistics and DCR graphs. In case these are not clear, we point out to <https://grammar.yourdictionary.com/> and <https://wiki.dcrgraphs.net/> for further explanations. In case of ambiguities originating from examples in the law, please communicate them via mail to lopez@di.ku.dk.

In order to have better estimates regarding the comprehension process in this guideline, we will ask you to annotate the time that you spend reading and making sense of this document. Your first task is to

- Write down the time when starting to read this document.
- Write down the time when you have finished reading this document.
- If you have to re-read parts of the document before having a full understanding this process, include this time in your count.
- send the total time that you have spent understanding the annotation guidelines to lopez@di.ku.dk

2 What is a DCR graph?

DCR graphs is a process modelling notation that has been developed for the formalisation and digitalisation of knowledge-intensive processes. The notation is both supported by a range of formal techniques, and serves as the formal base in the industrial (www.dcrgraphs.net) modelling and simulation tool. The DCR graphs technology has been employed in major industrial case management systems used in the public sector in Denmark. Modelling expressiveness in DCR includes multi-perspective dimensions such as time and data constraints [5, 9]. In this paper we only cover the core notation, that covers only roles, events and their causal dependencies (relations). We introduce DCR graphs via their graphical representation, recalling [4] for its formal foundation.

Figure 1 illustrates a business process model as a DCR graph. It contains a set of events (boxes) they describe basic work units, activities, decision and other events. Each event has a fixed assignment to a label (i.e.: “pay compensation for loss of earnings”). Moreover, we assume a fixed set of roles (i.e.: person, municipal council, etc) and a mapping from events to sets of roles. Each event has a state, which is a combination of flags denoting whether the event is currently in the domain of discourse (i.e.: solid border), it is excluded (i.e.: dashed border), it is executed (i.e.: checked box) or pending for execution

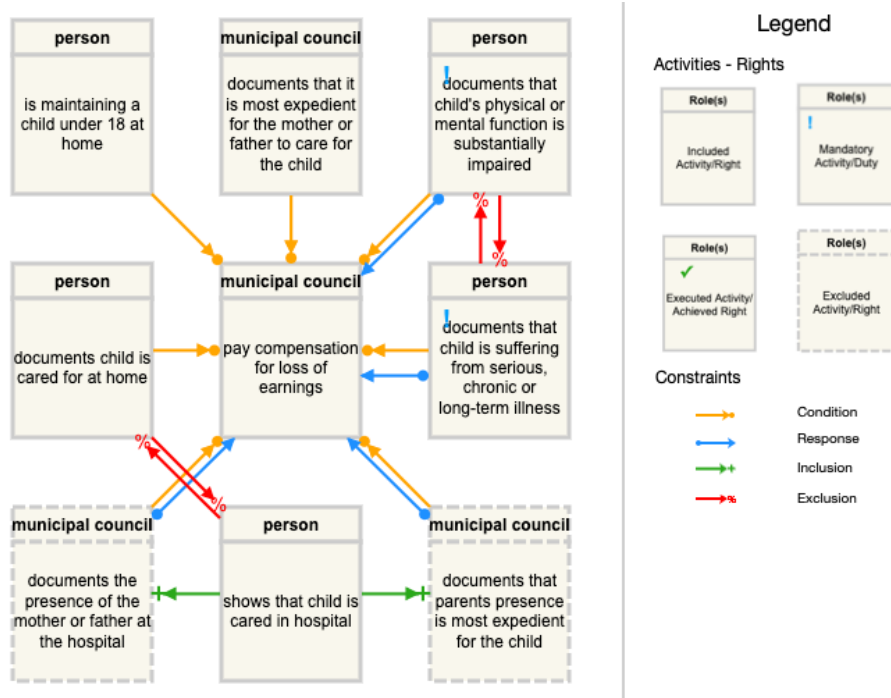


Figure 1: DCR graphs: Model Syntax by example

(i.e. box with an exclamation mark). States can be composed, so an event can both have been pending and be excluded at the same time.

A DCR graph is the union of events in a process model, as well as their event relations. A constraint *relations* between *events*. Relations can take the following shape:

- **Conditions** $e \rightarrow \bullet f$: Defines event e as a condition for f to execute. f is constrained until e have executed, or e is excluded.
- **Milestones** $e \rightarrow \diamond f$: Defines event e as a *follow-up execution* condition for f . Initially f is included among the possible actions, but if e becomes pending, then f cannot occur until e has occurred.
- **Responses** $f \leftarrow \bullet e$: Defines an *obligatory execution* for f . When e executes, f must eventually occur or be excluded.
- **Dynamic Inclusions** $f \leftarrow + e$: Defines *relevance* of an event. After executing event e , event f is included among the possible actions to take. Notice that the inclusion of f does not deem its necessity (which is capture by a response).

- **Dynamic Exclusions** $f \% \leftarrow e$: Defines *irrelevance* of an event. The result of executing e is that event f cannot happen. Moreover, all conditions and milestones originating in f are ignored.

Moreover, relations can be composed together, meaning that the same pair of events can share more than one type of relation. Compositional operators allows us to map useful behaviour based on a reduced set of constraints: for instance, a sequential pattern can be mapped as a combination of conditions and responses, and exclusive choices can be mapped as pairs of dynamic exclusions.

3 Recap: The structure of a law

Different laws have different structures, so a private contract does not contain the same information as a constitutional act. In this guideline we will concentrate on administrative acts. We will use different examples from the Danish consolidation act on social services, in its official translation to the english language, available at <http://english.sm.dk/media/14900/consolidation-act-on-social-services.pdf>.

A complete description of the structure of an administrative act is given in <https://indigo.readthedocs.io/en/latest/guide/law-intro.html>. We will adapt this to the danish setting, recalling the main components:

- Information regarding the **Executive Order number, date of reference, and validity of the order**. Example: *Executive Order no. 1053 of 8 September 2015 (Current)*
- A **Creator**: attribution of the ministry releasing the act. Example: *The Danish Ministry of Social Affairs and the Interior File number: Ministry of Social Affairs and the Interior, file no. 2015-4958*
- List of amended documents preceding this order. Example: *ACT No. 495 of 21 May 2013, ACT No. 722 of 25 June 2014*
- **The title**, usually called the “short title”, which is the key name used in other Acts for reference
- The **long title** often contains the date of commencement, the act number and the list of amendmended documents.
- A list of amendments and modifications to related acts, that have been implemented and considered in the current act.
- **Date of promulgation** (publication); who assented to (approved) the legislation. Optionally, which language was signed (in multilingual countries/jurisdictions); and what the **date of commencement is**
- A list of **Sections** (this is not part of the law, but assists in navigating through the Act)

- **Chapters or Parts**, identified by their headings. They might be referred using their Latin abbreviation, “Cap”.
- A number of **sections/regulations/rules** (according to the nature of the legislation)
- Side headings to the various sections (they serve navigation purposes)
- A section containing **definitions** (the meaning of words as used in the particular Act. This is a very important section, because words have different meanings in different contexts; and in law, we very often have to look at other Acts to see what a certain word means in context)
- **Subsections/subregulations/subrules** (as above)
- **Paragraphs** (usually (a), (b), and so on)
- **Subparagraphs** (usually identified by small Roman numerals: (i), (ii), (iii), and so on)
- **Schedule(s)**
- **Tables and diagrams**

A note on translations and false friends. The danish word “*paragraf*” translates in this context to the term “*section*”, as opposed to the false friend “*paragraph*”. In this work you will follow the english terminology.

4 Overview of the annotation process

The annotation will take place using the process highlighter [6] as an annotation tool. The process highlighter is an annotation tool that allows domain specialists (in this case, lawyers) to build formal specifications used in a decision making process. Such specifications¹ include information about actors involved, events in a case, and their relations between them. These specifications have a formal (mathematical) semantics, and they are prone to validation and verification techniques in the DCR portal. To have an overview of the formal semantics of DCR graphs, we invite the reader to consult [5] for further reference. The process highlighter is part of the commercial offering of DCR solutions, and it can be accessed at www.dcrgraphs.net. The installation and usage of the tool is covered at a great extent in wiki.dcrgraphs.net. Figure 2 showcases a screenshot of the tool in action.

The annotation process is summarised in Figure 3. Your day as an annotator will follow a given set of actions:

¹commonly known as *process models*

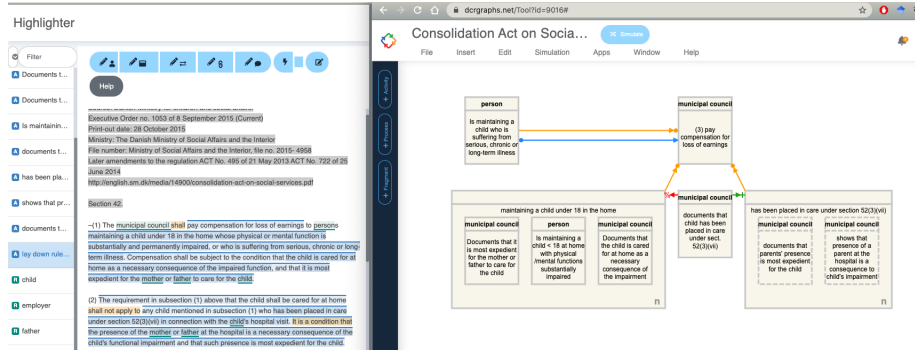


Figure 2: Highlighter: Law-Process pairing

1. Open your “annotation log” file. This is simply an Excel sheet containing rows of the sections you have annotated. In each row you will have the identifier of the section (e.g. “Consolidation of Social Services, section 50”), the time and date when you start the annotation process, the time and date when you finish the annotation process and the URL of the resulting DCR graph. Add a new entry by creating a new entry with the identifier and the starting time. An example of an annotation log can be found in Table 2.
2. Create a new DCR graph in **dcrgraphs.net**. Use as a title the name of the law and the section to be annotated, for instance “Consolidation of Social Services, Section 50”. In the description of the graph, include the text coming from the section to be annotated.
3. Share the graph with the DCR team. To do that you will need to open the Designer, open the advanced features, click on the “share graph” tab, and select the users you want to share it with. Please include “Rasmus Iven” and “Hugo Andres Lopez - Real” as part of the shared users.
4. Open the Process Highlighter by clicking on the top menu of the graph, in Apps → Highlighter. A new window will appear and you will have the text of the section. We recommend that you position the new window and the graph window side-by-side, to see the consequences of the annotations in your graph.
5. Starting with a the first paragraph of the section and continuing with the rest, use the annotation tools in the process highlighter to determine whether the paragraph content is of technical nature or not. You can do this following the guidelines in Section 5. Those sections/subsections/paragraphs/subparagraphs that are not technical norms will be annotated as *comments* in the process highlighter, leaving only the sentences that describe technical norms without comment annotations.

6. Process each of the remaining sentences, identifying the actors involved in a norm following the guidelines in Section 6. Annotate each of them as *roles* using the “role” annotation type in the process highlighter. In some cases, you will need to remove the ambiguities from the roles, you will do this by applying the patterns in Step 12
7. Identify activities, events, rights and obligations in a sentence. To do so, follow the guidelines in Section 7, and use the *activity* annotation type. In some cases, you will need to remove the ambiguities from the events, you will do this by applying the patterns in Step 12.
8. Perform label transformation whenever they are needed, so events in the process model become understandable. Follow the guidelines described in Section 9.
9. Enrich your annotations with information regarding difficulty and confidence levels of the annotation process. Consult Section 7.1 to see how.
10. Proceed to perform activity attribution by relating events to roles. To do so, please refer to the guidelines in Section 8.
11. Identify the sentences that constitute causal relations between events. Use the *relation* type annotation in the Highlighter this time. Follow the guidelines in Section 10 for this. In case of ambiguities in this step, please apply the patterns in Step 12.
12. In the case you find conceptual links between different entities, please mark these as *aliases* following the guidelines in Section 11.
13. Enrich your annotations with information regarding difficulty and confidence levels of the annotation process. Consult Section 10.3 to see how.
14. Once you have finished annotating at Section level, revise the graph to detect any inconsistencies. Do this based on Section 13.
15. After clearing any inconsistencies, save your graph as a major revision with name “For Revision”² and share the public url of the process³. Copy the resulting url next to the entry in the Excel document, and add the date and time of completion.
16. If for any reason one or more sentences do not correspond to any of the cases covered in the guideline, please collect them in a separate file (for instance, a Word document), and describe why it does not apply.
17. Evaluate the guideline and the usability of the process highlighter. See the evaluation phase in Section 15
18. Proceed with the next section and go back to step 1.

Creator John Smith
e-mail j.smith@dcrgraphs.net
Last update 01/11/2020 15:00

Section Name	Time and Date of start	Time and Date of finalization	Resulting graph url	DCR
Consolidation of Social Services, section 42	2020-06-01 08:30:27	2020-06-01 09:24:27	https://www.dcrgraphs.net/tool/main/Graph?id=6380ca14-b4fe-4b9f-b6f4-3c6152967000	
Consolidation of Social Services, section 50	2020-06-10 11:03:00	2020-06-10 11:23:58	https://www.dcrgraphs.net/tool/main/Graph?id=8d73b2b4-400e-4a5f-b1cf-58e598634daf	
...	

Table 2: Example of an annotation log

Once you have finished the annotations, please send the Excel files (and any word files) to lopez@di.ku.dk.

5 Annotating Technical Norms: Section Level

As noticed in Section 3, the purpose of each section might differ. While definition sections are important from an ontological perspective, they do not endow procedural information. Your task will be to separate those paragraphs that are non-technical from those that are not. We will focus on technical sections/subsections/paragraphs/subparagraphs. Namely, those parts in the legislation that contain procedural information. We will adopt the characterization presented by [2] to filter some of sections. Each annotation rule will be characterized by a guideline. For example:

Guideline 5.1. *The title shall only contain “comment” annotations.*

5.1 Examples of Non-procedural Sections:

Objective Section They outline the purpose behind the directive as a whole, or some parts of it, and the wider social and legal context.

²Click on File → Save as major revision

³Click on Options → Share Process → Public URL

1.-(1) The objectives of this Act are (i) to offer advice and support so as to prevent social problems, (ii) to offer a number of general services designed to serve as preventive measures at the same time and (iii) to satisfy needs resulting from impaired physical or mental function or special social problems.

Guideline 5.2. *An objective section shall only be annotated as a comment.*

5.2 Examples of Procedural Sections

Deontic Section They specify type of behaviour to be expected or permitted. Deontic norms have been further classified as permission, obligation and prohibitions (see [21] for an elaborate study).

ARTICLE 3: Member States shall, upon the request of another Member State or the Commission, provide information on the results of inspections and control measures carried out in relation to the requirements of this Directive.

Scope Section This type of section defines the extent of applicability or non-applicability of a norm (or even the entire legislation) in the context of other norms (or other legislation) with which they may otherwise conflict. Scope also concerns norms that specify the areas of competence in different jurisdictions.

Article 4: This Directive does not cover research using human tissues and cells, such as when used for purposes other than application to the human body, e.g. in vitro research or in animal models. Only those cells and tissues that in clinical trials are applied to the human body should comply with the quality and safety standards laid down in this Directive.

5.3 Meta-norms

Meta-norms are higher-order norms, meaning that they rule over the application of other norms. Laws do not only pertain to certain behaviours but also (1) the way in which the norms are produced, (2) the way in which they are applied and (3) the way in which upon violation a sanction is imposed. We distinguish between kinds of meta-norms:

Application Procedures Procedural refers to step-by-step processes for implementing law e.g. get signatures, agreement from the Committee, further signatures. Since their objective is procedures how to change the legislation

and not how to apply it, they are not part of the process to be implemented in municipal governments, thus they are not considered applicable.

2.a(3) The Minister for Social Affairs and the Interior shall lay down rules governing compliance with the conditions for eligibility.

ARTICLE 6: Member States shall send the Commission, before 7 April 2009 and every three years thereafter, a report on the activities undertaken in relation to the provisions of this Directive, including an account of the measures taken in relation to inspection and control.

Notice that while this article has defined an activity (i.e.: *send a report of activities*) it is not possible to identify which of all the activities it is referring to from the context. The solution will be to apply this rule on the context of all possible instances of administrative processes ruled by this law, but those cannot be known from the context a priori, thus they are excluded.

Guideline 5.3. *Application procedures shall be annotated as comments*

Contextual Metanorms These articles describe the time, jurisdiction, space, addressee and hierarchy applicable for the norm.

ARTICLE 7: This Directive shall enter into force 30 days after the day of its publication in the Official Journal of the European Union.

Notice that, while it is possible to define relative time of application in DCR graphs, absolute time is still an ongoing challenge, thus it is excluded from the annotation scheme.

Other meta-norms will include an arrange of nested verbs in the predicate, such as the following:

The Minister for Social Affairs and the Interior shall lay down rules specifying any assistance that may continue to be provided to a person residing outside Denmark on a temporary basis and the conditions for the provision of such assistance

Guideline 5.4. *Contextual metanorms shall be annotated as comments*

5.4 Annotating Non-technical sections

In order to filter non-technical sections, we will mark them as “comments” in the process highlighter. This will filter the selected text, leaving only technical sections to perform further extractions. A screenshot of the commenting annotations is presented in Figure 4.

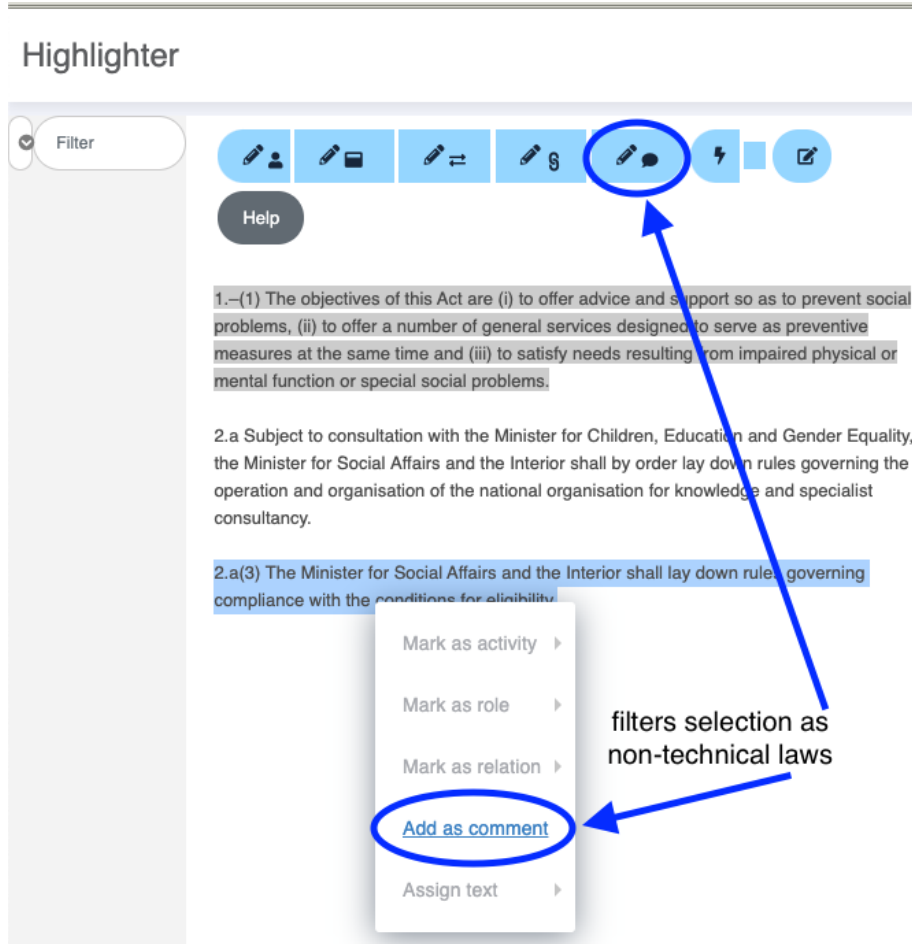


Figure 4: Commenting Non-technical sections

6 Identifying actors and entities

Once non-procedural paragraphs have been filtered out, we can proceed to identify sets of concepts that constitute a law. The following annotations will be performed at a *sentence-level*, taking care of not crossing sentence boundaries. Furthermore, inside each sentence there will be textual fragments (ensembles of words that are constitutive part of the sentence) that will have a specific semantic meaning. At the present moment we will focus on the identification of agents, events and relations between events.

6.1 Roles, actors and legal entities

Permissions, obligations and violations tend to be assigned to legal entities (e.g. “the municipal council”) in the act. Rather than proper names (e.g. “Charlie”) we tend to find actors (“the minister for social affairs”). Some of these actors might be defined in the act, as part of the Definitions section.

Examples of valid roles:

- *person*
- *Minister for Social Affairs and the Interior*
- *The Minister for Children, Education and Gender Equality*
- *municipal council*
- *regional council*
- *Danish resident*

For linguistic purposes, we relate roles to subjects. The subject is a noun, pronoun or noun phrase. For example:

- *The National Board of Social Services will set a time limit for the order.*
- *he/she has a special connection*

While “he/she” can be considered as simple and single-word subject, “The national board of social services” will be considered a compound role. We will always try to annotate the totality of the compound role.

Guideline 6.1. *Nouns, pronouns or noun phrases shall be annotated as roles*

When identifying roles, we need to make a differentiation between active and passive roles. An active role is a subject that performs an action, while the passive role is the subject to which such an action is being applied to. In the example “*The **municipal council** shall provide preventive measures for the **child, young person or family** ...*” the active role is the municipal council, while the passive roles are the child, young person and family. Roles might change from passive to active roles in different sentences, but when performing the annotations, we will focus in annotating only active roles. In DCR we follow the business process modelling guidelines from [7], which suggest that activities will follow an role/verb pattern, where the role is that one appearing in active voice.

Guideline 6.2. *If role appears as a passive role in a sentence, it shall not be annotated.*

Similarly, we make a differentiation between the subject that performs an action, and what is this action about. In the section:

14.-(1) The *Minister for Social Affairs and the Interior* shall collect and communicate information about *municipal, regional and private services and facilities* covered by section 4 of the Act on Social Supervision

The municipal, regional, private services and facilities determine the content of the actions (collect and communicate information), to be executed by the Minister for Social Affairs and the interior. Therefore, they will not be marked as roles.

Guideline 6.3. *Only performing subjects will be annotated as roles*

Typically, the predicative part of a sentence contains the reasons of an action. Since we are only capturing the “what” rather than the “why”, information regarding the reasons why certain activities are executed will not be considered at the moment. Thus in the following example, only active roles will be annotated:

50.-(1) Where it must be assumed that a *child or a young person* is in need of special support, partly due to impaired physical or mental function, the *municipal council* shall ensure that the conditions of the *child or the young person* are examined.

The sentence above can be divided in both 1. the set of assumptions required for this paragraph, and 2. the set of actions that a role needs to perform. Interestingly, neither the first nor the second occurrence of “the child or the young person” are associated to activities that the role needs to perform, thus they are not considered as annotations.

Guideline 6.4. *Subjects in the predicative part of a sentence will not be annotated as roles.*

In this work we will not consider markings originated from the inclusion of considerations coming from other laws, as in the following example:

(5) Pursuant to the *Act on the Labour Market Supplementary Pension Scheme*, the *municipal council* shall pay ATP contributions in respect of the special supplement.

Guideline 6.5. *Subjects expressing inter-document dependencies should not be marked as roles*

In the case the sentence contains a list of roles (e.g. “Children, young persons and parents can request for revision of the case”), each of them will be annotated separated as roles (*Children*, *young persons* and *parents*).

Guideline 6.6. *When the subject phrase contains a list of roles before a verb, each subject will be annotated as a separate role*

However, if the list of roles describes an action that different roles need to perform together, they will be marked as one single unit, for example, “*Parents as well as children and young persons seeking counselling may receive such counselling on an anonymous and open basis.*”.⁴.

Guideline 6.7. *If the sentence denotes an action including a list of subjects that need to act together, the list will be annotated as a single “role” annotation*

Certain roles might appear in singular or plural forms, in the case of plural forms, please refer to Guideline 11.3.

6.1.1 On Pronouns

A pronoun is a word that takes place to replace a noun. A couple of examples coming from the consolidation act of social services:

- *The same shall apply to the care or treatment etc. of a **Danish resident taking up residence in another country** to which **he/she** has a special connection*
- *By agreement with other states or international organisations, the municipal council may grant assistance for long-term care or treatment etc. in Denmark to a **person who** has a special connection to Denmark, but **who** is not a Danish resident at the time of application*

Pronouns (in bold in the examples above) alone do not qualify for a subject, since the same pronoun may be used to explain different subjects. However, they endow important information regarding predicate, state of affairs and activities that a role might perform. Thus, they will be marked as aliases of existing roles.

Guideline 6.8. *Each pronoun shall be associated with an existing role via an alias annotation.*

Please refer to the section 11 for clarifications on how to associate aliases.

6.2 The role of context

While a given role can appear in multiple sentences, it is important to include the context in order to eliminate ambiguities. Take the following two sentences:

*Subject to consultation with the **Minister** for Children, Education and Gender Equality, the **Minister** for Social Affairs and the Interior shall by order lay down rules governing the operation and organisation of the national organisation for knowledge and specialist consultancy.*

⁴The reason for this is that the composition of roles in DCR is disjunctive by default, and conjunctions like the one above need to be performed explicitly

It is wrong to assume that the role in question is the same Ministry. Therefore, our annotations will include the context of the role, as in [Minister for Children, Education and Gender Equality](#) and [Minister for Social Affairs and the Interior](#).

Guideline 6.9. *If a subject is surrounded by a set of qualifiers (context), the corresponding annotation will include the subject and its context.*

Similarly, a role may be either the performer of an action, or the receiver of the action. For example:

*(11) Subject to consultation with the **Minister for Children, Education and Gender Equality**, the **Minister for Social Affairs and the Interior** shall by order lay down rules governing the operation and organisation of the national organisation for knowledge and specialist consultancy.*

The first role (minister for children, education and gender equality) acts as the receiver of an action (consultation). Thus, such role will not be marked. Instead, the second role performs an action (“lay down rules...”) and thus should be marked as the role [Minister for Social Affairs and the Interior](#).

Guideline 6.10. *If in a sentence a role appears as the receiver of an action, it should not be annotated as a role.*

7 Annotating Rights, Obligations, Actions, Decisions and Events

One of the critical parts of norm annotation is the identification of situations, acts or course of actions that are legally binding. DCR encloses all these information in what we simply call “events” and “activities”, we will not make distinction between them in this document, and refer to each other interchangeably unless otherwise specified.

In order to identify events, each sentence will be examined in its predicative part. Normally activities can be found as an active verb followed by an adverb phrase. Some examples of correct actions are:

- [assist in the provision of safe and appropriate technical aids](#)
- [be eligible for accommodation in a nursing home under subsection \(1\)](#)
- [establish services and facilities falling within subsections \(1\), \(3\) and \(4\) hereof](#)
- [operate the facilities referred to in section 67\(1\) subject to agreement under section 194\(2\)](#)

- *provide information about services and facilities covered by section 5 above to the Social Services Gateway, cf. section 14 below*
- *has a special connection to Denmark*
- *is not a Danish resident at the time of application*

Guideline 7.1. *If a sentence can be decomposed in a Subject/verb/predicate pattern, the activity annotation will include the verb/predicate part of the sentence.*

Notice that the verbs capture the current state of affairs in a case (e.g. “has a special connection to Denmark”) as well as activities (e.g. “provide information”). Yet, they are all part of the decision events: actions cannot be taken without evidence of the existing state of affairs. Notice that verbs in both positive forms (e.g. “has a special connection to Denmark”) and negative forms (e.g.: “not having inadequate funds to meet such expenses”) will be equally included as events. An exception to the annotation of verbs pertains the use of **modal verbs** (such as *may, can, cannot, shall, ought, etc*). Modal verbs denote deontic constraints, and they will be described at length in the next Section. In the case of conjunction between verbs, they will be annotated in a single annotation, as in:

*The Minister for Social Affairs and the Interior shall **collect and communicate** information about municipal, regional and private services and facilities covered by section 4 of the Act on Social Supervision*

Guideline 7.2. *If a sentence contains a simple predicate containing a modal verb, the activity annotation will range between the end of the modal verb, and the end of the predicate.*

In the case of a compound predicate that spans over different subsentences, we will decompose the event annotation to capture events in each one, as in the following:

The municipal council shall pay compensation for loss of earnings to persons maintaining a child under 18 in the home whose physical or mental function is substantially and permanently impaired, or who is suffering from serious, chronic or long-term illness.

Guideline 7.3. *If a sentence contains a compound predicate, each clause will be annotated as an activity*

Oftentimes, texts use lists in order to describe sets of requirements that are necessary to fulfil an objective. If such requirements are decisions to be taken into consideration, we will need to mark them separately:

The municipal council shall decide to discontinue the order where it finds (i) that the circumstances giving rise to the order no longer exist or (ii) that the parenting order is no longer suited to resolve the problems of the child or young person.

Guideline 7.4. *If a sentence contains a predicate with lists of clauses, each of these clauses will be annotated as an activity*

Sentences may be written in active or passive voice. In an active voice, the subject precedes the verb, and the object that receives the action comes after the verb (e.g. “the municipal council pays the parent”). In a passive voice, the subject, the object and the verb are exchanged so the subject comes after the verb, and the object comes before the action (e.g. “Payment will be given to the parent by the municipal council”). In these cases, the event annotation will still consider the verb in its modified position, as in the following example

Compensation shall be subject to the condition that the child is cared for at home as a necessary consequence of the impaired function

Guideline 7.5. *If the sentence is written in passive voice, the activity annotation will include the receiver of the action, as well as the verb denoting the action*

An interesting case constitutes the use of past tenses in the conjugation of verbs:

*Where the municipalities **have** not reached an agreement on a financing model within four months of the order, [...]*

The first verb (“have”) qualifies the event as something that must have happened in the past. Thus the annotation will take the second verb as an event only.

Guideline 7.6. *If the verb is conjugated in present perfect, past perfect, or future perfect, then the activity annotation will only consider the infinitive portion of the verb plus its predicate*

7.1 Event Enrichment

Part of the annotation work requires us to understand where and how events have been created, how difficult was to identify events in the legal text, and how confident are we regarding the correct annotation of events. To do so we will enrich the activities with additional information in the Description text field, see Figure 5.

For each event you are required to provide the following information:

1. Did you use the highlighter or the modeler?
2. Did you use a guideline for this annotation? if so provide the number

3. How difficult was it to identify this event in the text?
4. How confident are you about this annotation?

In order to facilitate the answering of the questions, you will write a code that answers each of these questions. The code is composed of 4 letters and numbers in the following way:

1. Highlighter = H, Modeler = M
2. 7.4 if the guideline applied was 7.4. X if no guideline was applied.
3. A number between 1 and 7 according to the Difficulty scale below:

Difficulty Scale	
1	Very easy
2	Easy
3	Rather easy
4	Neither easy nor difficult
5	Rather difficult
6	Difficult
7	Very difficult

4. A number between 1 and 7 according to the confidence scale below:

Confidence Scale	
1	Very confident
2	Confident
3	Rather confident
4	Neither confident nor unsure
5	Rather unsure
6	Unsure
7	Very unsure

The text in the label in Figure 5 provides an example of the answers for the event *receive original report*. Here, the annotator has used a string “H 7.6 2 2” which means that the annotator has used the Highlighter, applied guideline 7.6. Moreover, the annotator found annotating the activity was moderately easy, and she has is confident that she did a good annotation.

8 Event Attribution

An important aspect of the formalisation of laws is the identification of who is the subject responsible for executing an event. This is done by associating activities to one or multiple roles. At this stage we assume that all the roles that were denoted by pronouns have already been disambiguated (see Sec 11.3). We attribute an event to a role by clicking on the event highlight and selecting the role(s) that can/must execute the event in the menu in the lower part of

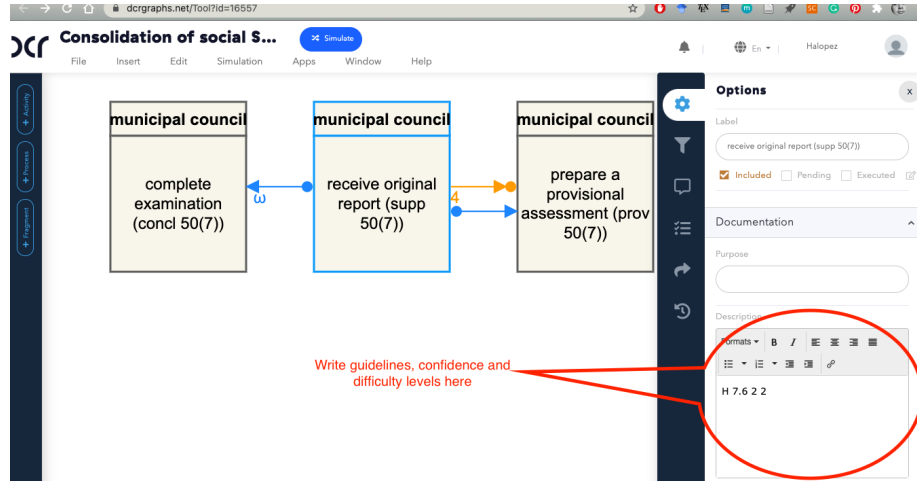


Figure 5: Description field

the highlighter window (see Figure 6). Let us recall some of the examples in previous sections to identify the pairings between roles and events.

*(5) Pursuant to the Act on the Labour Market Supplementary Pension Scheme, the **municipal council** shall **pay ATP contributions in respect of the special supplement**.*

The above example takes advantage of the fact that the sentence is written in active form, thus the subject (the municipal council) appears before the event (Pay ATP contributions) and its modality (shall).

Guideline 8.1. *In an active voice sentence conforming to a subject+modal verb +event pattern, the event will be attributed to the subject.*

Guideline 8.2. *In a passive voice sentence conforming to a object + verb + subject pattern. the event will be attributed to the subject.*

Guideline 8.3. *If the active subject in the sentence corresponds to a pronoun, please apply the set of guidelines corresponding to co-reference resolution techniques in 11.3 before performing event attribution.*

It is important to point out that false positives should not be counted in event attribution, so roles previously discarded in Section 6 should not be annotated.

9 Label Transformation

Until now most of our work has focused in the identification of text fragments that denote decision processes in a law. Equally important in this process is the

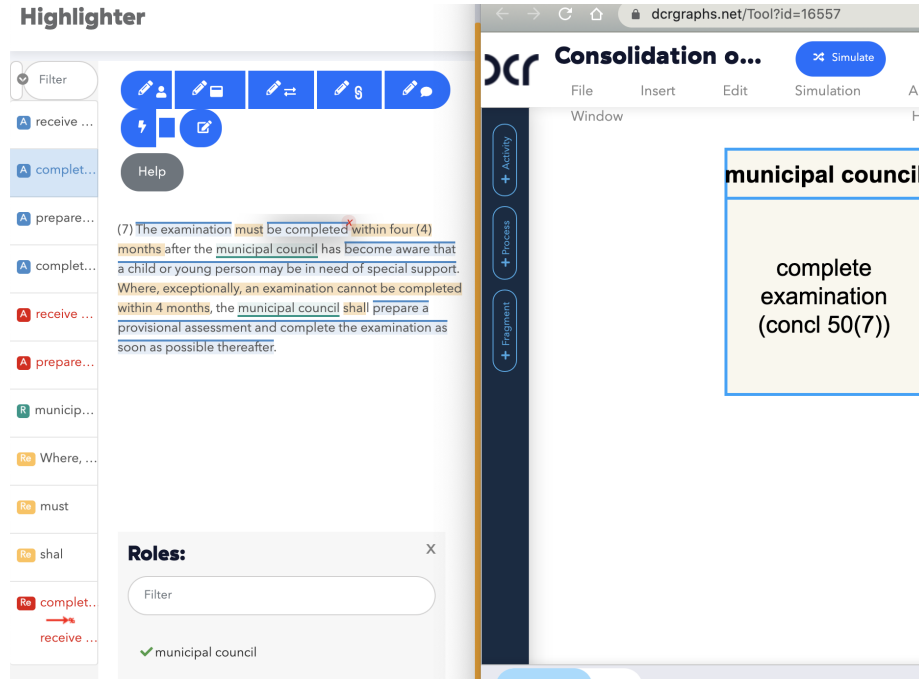


Figure 6: Event Attribution

generation of understandable process models, that people can use for communication and sense-making. According to Mendling et al. [7] an important aspect in the understandability of process models is the way events are written. In particular, passive voice makes events harder to understand than active voice. Your task here will require you to rewrite the labels in events so all of them are written in active voice, following the role+verb+predicate pattern.

Figure 7 presents the annotation tool side-by-side with the graph modelling tool. Notice how each of the annotations done in the highlighter have been converted to events in the graph. However, understanding them is difficult, as the user does not know the time of execution of the event “maintaining”. Moreover, because some labels are long, sometimes the label will be cut in a way that is not understandable. Finally, labels might introduce ambiguities (see event “person is suffering from serious, chronic and long term illness” when the intent of the law denotes that is the child that the person maintains the one that might exhibit these conditions).

These problems can be resolved by modifying the resulting label in the Label Field in Figure 7. The following are the guidelines for label transformation of extracted activities.

Guideline 9.1. *If the activity label corresponds to the verb + predicate pattern, and the predicate is complete (i.e. it has not been split), do not change the label*

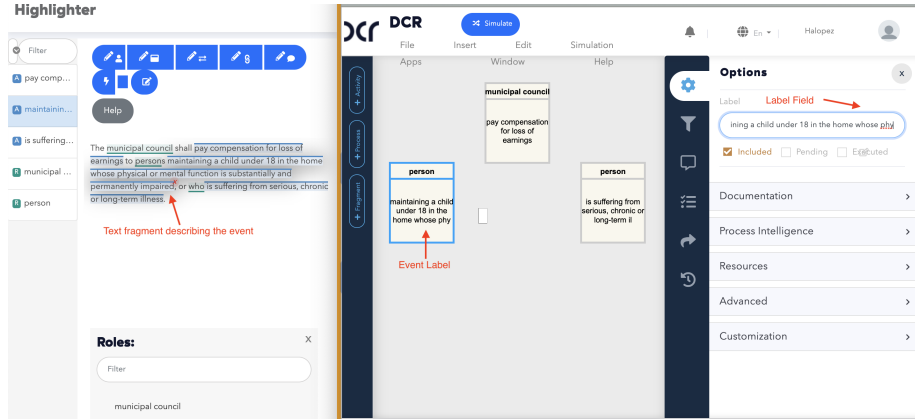


Figure 7: Label Transformation: before state

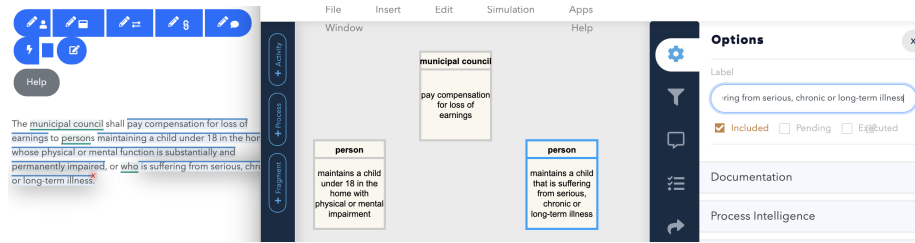


Figure 8: Label Transformation: after state

Guideline 9.2. *If the activity label corresponds to a verb + predicate pattern, and the predicate is incomplete. Modify the label so it represents a full predicate*

Guideline 9.3. *If the activity label corresponds to a sentence in passive voice, modify the activity label by transforming the sentence into an active voice pattern verb + predicate*

Figure 8 presents the end result of the application of the transformation guidelines.

10 Annotating Relations between legal concepts

We will recall some of this concepts, based on [8]:

Obligation A situation, an act, or a course of action(s) to which a bearer is legally bound, and if it is not achieved or performed results in a violation.

Prohibition A situation, an act, or a course of action(s) which a bearer should avoid, and if it is achieved results in a violation.

Pattern	Deontic straint	con-	Type of DCR relation
event shall be granted, provided that list of events	Permission		Condition
event shall be subject to the condition list of events	Permission		Condition
The role may event if list of events	Permission		Condition
Once list of events, role may event	Permission		Condition
Before event must list of events	Permission		Condition
When list of events, role must event	Obligation		Response
After list of events, role ought event	Obligation		Response
After list of events, role shall event	Obligation		Response
Where list of events, role will event	Obligation		Response
Cannot, may not, must not, ought not, shall not, will not	Violation		—
event shall not apply to list of events	Defeasible		Dynamic Exclusion
event shall be discontinued when list of events	Defeasible		Dynamic Exclusion
event shall cease when list of events	Defeasible		Dynamic Exclusion
event shall be lifted when list of events	Defeasible		Dynamic Exclusion
event shall include list of events	Defeasible		Dynamic Inclusion

Table 3: Associations between sentence patterns, deontic modalities, and DCR relations

Permission Something is permitted if the obligation or the prohibition to the contrary does not hold.

Defeasible conditions They enable us to describe the course of action resulting from exceptional cases (contrary to duty). They may modify (remove or include from the context) obligations, permissions and prohibitions.

While the previous task you were instructed to perform the annotations at the level of sentence fragments, relations require you to annotate full sentences. In order for a sentence to be considered a relation, it should contain at least one existing annotated event, though multiple events are also possible⁵. Moreover, the grammatical structure of the sentence must contain a modal verb qualifying the events in the sentence. A summary of the grammatical modalities, its corresponding deontic constraints and associated DCR relations is presented in Table 3, inspired in [1].

Guideline 10.1. *If the sentence corresponds to a sentence pattern similar to those indicated in Table 3, and the sentence contains activity annotations, then a new “relation” annotation will be created, ranging from the start until the end of the sentence. The type of constraint will be defined by the “Type of DCR relation” constraint in Table 3.*

⁵In case that you find a deontic relation that does *not* include specific events, please contact me with your example

10.1 Relation Types

Relations have a direction, with starting and ending activities/events. It is necessary to identify source/target events using the relation annotation, as well as the type(s) related to the relation, as presented in Figure 9. Intuitively, we can divide the relation sentence into a pattern *list of clauses + modality + list of consequences*:

Condition A sentence that denotes a condition relation requires that **each of the clauses** is fulfilled for the list of consequences to be allowed. This is akin of granting a set of rights. Rights are obligation, and they might be enforced or not. When annotating condition relations, each clause will be considered a source event, while the list of consequences will be associated to the list of granted rights.

Response A sentence that denotes a response relation requires that **any of the clauses** generate a list of obligations to be fulfilled. Comparing to rights, all obligations must be fulfilled in a case, so the case cannot be closed if they are not executed. When annotating response relations, each clause will be considered a source event, while the list of obligations will be associated to the list of target events.

Exclusion A sentence that denotes an exclusion relation requires that any of the clauses inhibits the consequences from happening. This could be because the consequences are no longer necessary in the processing of the case. When annotating exclusion relations, each clause will be considered a source event, while inhibited consequences will be associated to the list of target events.

Inclusion A sentence that denotes an inclusion relation requires that any of the clauses makes available the list of consequences. This could be, for instance, when allowing new alternative paths for a case, or when adding optional events that can happen in a case. When annotating inclusion relations, each clause will be consider a source event, while included consequences will be associated to the list of target events.

Milestone A sentence that denotes a milestone relation requires that the list of consequences cannot be executed if the list of clauses is pending for fulfilment. When annotating milestone relations, each inhibitory clause will be considered as a source event, while consequences will be associated to the list of target events.

Condition + response A very common variant to single modalities is the combination of the grant of rights and the imposition of obligations. If a sentence requires **all clauses** to happen in order to impose an obligation, such sentence will combine the condition and response patterns. When annotating

Figure 9: Relation annotation, selection of source and target events

condition relations, each clause will be considered a source event, while the list of consequences will be associated to the list of granted rights.

10.2 Annotation examples for relations

We provide some examples of accepted annotations:

Condition

2.(3) By agreement with other states or international organisations, the municipal council may grant assistance for long-term care or treatment etc. in Denmark to a person who has a special connection to Denmark, but who is not a Danish resident at the time of application.

In this case, the sentence identifies two clauses: the first one is that (a person) has a special connection to Denmark, and the second that (the same person) is not a danish resident at the time of application. Both conditions need to be true for the municipality to be allowed to provide grant assistance. Provided the keyword “may” gives us an indication that the type of annotation in this case is a condition.

Response

13.c.(2). Where the municipalities and regions have not reached an agreement on who is to operate the service or facility within four months of the order, the National Board of Social Services will make a decision on this

In this case, we have the imposition of an obligation to the national board of social services, that must (take a decision) due to the formal recognition that after four months of the order municipalities (have not reached an agreement)

Condition+response

The municipal council shall pay compensation for loss of earnings to persons maintaining a child under 18 in the home whose physical or mental function is substantially and permanently impaired, or who is suffering from serious, chronic or long-term illness.

In this case, the whole sentence is marked as a condition + response relation. The underlined obligation modality (identified by shall) relates three events. The clauses are: 1. (the person) maintaining a child under 18 at home, and 2. (the person) maintaining a child that is suffering from illness. **Both** events need to be true for (the municipal council) to 3. **pay compensation for loss of earnings**. In DCR graphs, this means that the sentence encloses two relations:

- A condition+response relation from event “maintaining a child under 18 in the home whose physical or mental function is substantially and permanently impaired” to “pay compensation for loss of earnings”, and
- A condition+response relation from event “is suffering from serious, chronic or long-term illness” to “pay compensation for loss of earnings”.

*48.-(1) Before the municipal council **makes a decision under sections 51, 52, 52a, 56, 57a, 57b, 58, 62 and 63, section 65(2) and (3) and sections 68-71 and 75, the child or young person must be consulted on these matters.***

The sentence above describes a temporal relation between events. It should not be possible to make a decision without having first consulted the children. The modal verb must is used to denote such impossibility, but it does not impose the obligation of making the decision after having consulted the child (it is perfectly ok to consult the child and not take a decision afterwards). Thus the relation type will be assigned to a **condition**

*112.-(1) The municipal council shall **grant support for technical aids to persons with permanent impairment of physical or mental function where the aid (i) **will remedy the permanent effects of the functional impairment significantly**, (ii) **will facilitate daily life in the home significantly** or (iii) **is necessary to enable the person to pursue an occupation*****

In this case, the antecedents of the relation are any of the events described in the list: that (the aid) will remedy the permanent effects, that (the aid) will facilitate the life at home, or that (the aid) is necessary to enable a person to have an occupation. Its consequent is that (the municipal council) grants support for technical aids. The nature of the modality between antecedents and the consequent is of an obligation, thus the type of the DCR relation will be a response.

Notice that the word “where” might be used to describe antecedents. This inflection of the word might appear in sentences expressed in active or passive voice. In certain cases, modal verbs might be reinterpreted as provisions for a rule. An example of this is the following:

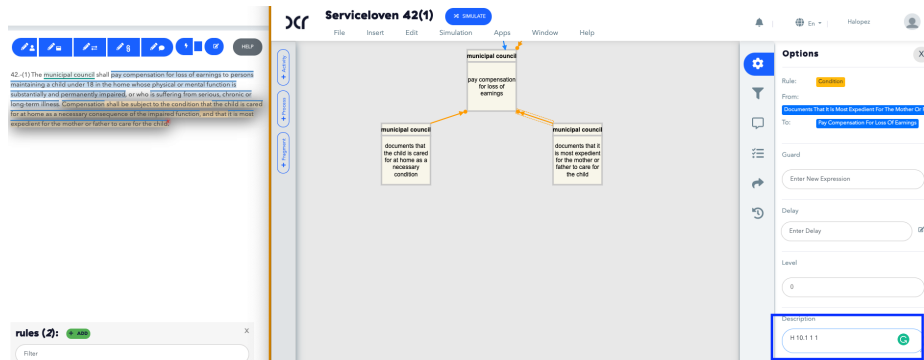


Figure 10: Relation Enrichment: positioning of the relation comments (in blue)

*Where it **must** be assumed that a child or a young person **is in need of special support**, partly due to impaired physical or mental function, the municipal council **shall ensure that the conditions of the child or the young person are examined**.*

Matching this phrase with a response pattern as suggested by table 3 will create an obligation for a child of young person to be in need of special support, which is not the intent of the law. Instead, the sentence before the comma (*where it must be assumed that a child...*) will be a provision for (the municipal council) to act (ensuring that the conditions of the child are examined). Thus, the correct mapping of this sentence will be a condition relation between (the child or a young person) in need of special support) and (the municipal council) ensuring that the conditions of the child or the young person are examined.

10.3 Relation Enrichment

Similar than with events, we require to understand how annotations for relations have been performed. To do so, we will compile the same type of information that we collected for events (See Section 7.1), but in this case, we will collect it for relations.

Figure 10 presents an example on the positioning and string used to annotate relations.

The string obeys the same format provided in Section 7.1, and it provides numerical answers to the following questions:

1. Did you use the highlighter or the modeler?
2. Did you use a guideline for this annotation? if so provide the number
3. How difficult was it to identify this relation in the text?
4. How confident are you about this annotation?

The scales to answer these questions are the same than those for 7.1.

Note: it is important that you keep yourself compliant to the format of the string above. Non-numerical values (i.e.: long explanations) will be ambiguous and hard to process later.

11 Links between concepts

11.1 Syntactically equal

Roles and activities might be repeated in different parts of the law. Their occurrence enrich the set of considerations that the law has for these entities, for instance, adding more relations between events. Multiple mentions of the same entity do not create further elements in the DCR graph. For example:

*(3) The **municipal council** shall provide preventive measures for the child, young person or family when it is assessed that support under (i)-(iv) can accommodate the child's or young person's needs. The **municipal council** may offer the following preventive measures*

Here, the municipal council in the two sentences refers to the same role. The second mention will not create a new role annotation, but it will be an additional alias annotation to the existing role “municipal council”.

Guideline 11.1. *If a role/event/relation is syntactically equal to an existing annotation, this should be marked as an alias to the existing role/event/relation.*

11.2 Syntactically Similar

Roles, activities and relations can be mentioned in shortened versions, as in the following example:

*62.-(1) ... the continued application of a measure taken under section 58 above for more than two (1) years from the date of the relevant decision by the **children and young persons committee** shall be subject to a renewed decision by the **committee**.*

The second occurrence of “the committee” makes reference to the earlier mention of “the children and young persons committee”, thus, it will be annotated as an alias.

Guideline 11.2. *If a term to be annotated corresponds to a shortened version of a existing role/event/relation, this should be marked as an alias.*

In other cases, a text will refer to plural and singular forms of the same entities. For example

68f.(2) Before any such recommendation under subsection (1) above is given, the children and young persons committee shall give the child or the young person, the child's or the young person's parents, **custodial parents** of the child or young person and any foster parents of the child or young person and any attorneys and their advisers an opportunity to be heard.

This role is nothing more than a reference to a role that has been defined earlier in the document. In the case of the consolidation act of social services:

11.(4) The municipal council may decide to provide financial support to the **custodial parent** if the municipal council finds that support under (i) and (ii) above can accommodate the child's or young person's need for special support.

When annotating roles, we would pay attention not to duplicate their occurrences. In the case above, we will then annotate **custodial parents** as an alias of the existing role **custodial parent**.

Guideline 11.3. *If an annotation candidate contains a term in a plural form and there exist already a version of the same annotation in singular form, the annotation candidate should be marked as an alias of the existing term.*

11.3 Co-reference resolution

In Section 6 we saw how pronouns qualify actions depending on earlier actors. Annotating pronouns as actors might create ambiguities, as the same pronoun can be used to qualify different actors. Thus the task of co-reference resolution aims at reducing such ambiguity by linking a pronoun to its true actor. For example:

(3) By agreement with other states or international organisations, the municipal council may grant assistance for long-term care or treatment etc. in Denmark to a **person** who has a special connection to Denmark, but **who** is not a Danish resident at the time of application.

The bold word “who” is nothing else than the person that has been mentioned before. Thus, we will annotate person and “who” as aliases of the same concept (the role person).

Guideline 11.4. *If a pronoun corresponds to an annotation candidate, this should be annotated as an alias of the real subject that performs the action*

11.4 Semantically similar concepts

Predicate-noun links A common type of entity link occurring in danish acts is the referral of activities as nouns. Such a pattern between different sentences, or different sections:

*42.-(1) The municipal council shall **pay compensation for loss of earnings** to persons maintaining a child under 18 in the home whose physical or mental function is substantially and permanently impaired, or who is suffering from serious, chronic or long-term illness.*

*... **The compensation** shall be fixed on the basis of the previous gross income, always provided that the maximum amount of compensation shall be DKK 27,500 a month*

Here, the noun “compensation” refers to the activity “pay compensation”, omitting the verb. Thus, “the compensation” is not a role (as one might expect following Section 7) but an alias to the activity “pay compensation” previously defined.

Guideline 11.5. *If a noun appears as an role candidate, and there exists an event annotation whose predicate refers to such noun, then the event candidate should be marked as an alias of the existing event.*

12 Inter-Section Dependencies

*11.-(3) The municipal council shall provide preventive measures for the child, young person or family when it is assessed that support under (i)-(iv) can accommodate the child’s or young person’s needs. The municipal council may offer the following preventive measures: (i) **Consultancy, including measures targeting families.** (ii) **Network or support groups.** (iii) Counselling on family planning. (iv) Other measures designed to resolve any problem or difficulty experienced by a child, a young person or a family.*
*(4) The municipal council may **decide to provide financial support to the custodial parent** if the municipal council finds that support under (i) and (ii) above can accommodate the child’s or young person’s need for special support.*

The relation described in subsection (4) will not be expressible unless we know what are the definition of the listings (i) and (ii). Such events are defined in section 11.(3), thus we will first annotate, and then create an alias between the occurrence of (i) in 11.(4) and “(i) Consultancy, including measures targeting families” in 11.(3), and between (ii) in 11.(4) and “(ii) Network or support groups” in 11.(3).

Guideline 12.1. *If an event refers to clause that makes a reference to a decision/event defined in a different article, you shall 1. insert the referred article in the highlighter text, 2. annotate the referred article, and 3. establish an alias annotation between the referenced event and the referred event.*

13 Resolving Inconsistencies

After all the annotation steps have been executed, you will end up with texts that are annotated, and parts that are not annotated.

One possibility that the modelling of laws offers, is that laws are freely interpreted. In this way, new rules/events can be included from the modeler. While this is more intuitive in certain cases (for instance, to accommodate common sense rules), it is necessary that we are able to provide, as much as possible, a relation between the information in the DCR model and the text in the highlighter. The process of reconciliation between annotations and highlights require us to locate the event/relation that has been introduced in the model but does not have highlights. This is easily perceived in the highlighter with red marks in the event navigation panel, see Figure 11. You will need to highlight the text that corresponds to this event/relation, and then assign the event relation to the existing event in the modeler. An example on how the user interface supports you in this process is provided in Figure 12. The resulting state should must show that the previously free event/relation is now annotated, see Figure 13.



Figure 11: Reconciliation between models and highlights: before state

There might be unfortunate cases that some parts cannot be annotated (for instance, there is no associated text to it, or there is no corresponding guideline that supports the annotation). Your task here will be to observe which parts are not annotated, and see whether there are any further rules you could come up for this annotation. If there is any possible complements, write a list of suggestions including:

1. Snippet of the problematic section
2. Guideline
3. Example of the guideline in practice (how will the text look after the annotation?)

Please send your comments to lopez@di.ku.dk

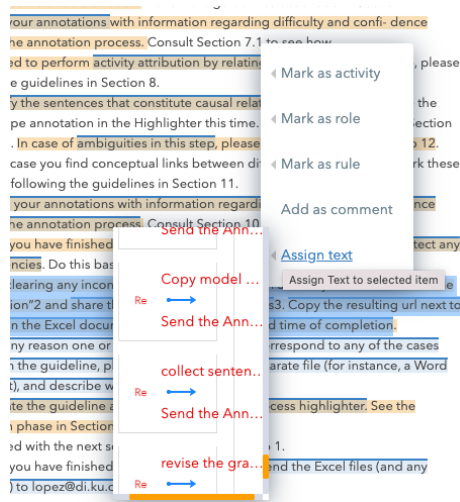


Figure 12: Reconciliation between models and highlights: assigning relations to highlights

14 Exclusions

There are some sentences that will not be annotated, as there are no corresponding semantic elements in the DCR notation to map to, or that cannot be digitalized.

Indeterminate roles

- *any other persons having the actual care of a child or a young person*

the reason why this is not annotated as a role is because there is not a determinate person. Roles will need to have an association with persons, which we do not have at the moment.

Purpose and Intention Sentences Certain sentences will describe the scope, intentions or purpose as for why taking a decision. For instance:

The purpose of such counselling is to prevent social problems and to help the citizen overcome immediate difficulties and, in the longer term, enable the citizen to deal with problems as they arise without outside assistance.

and

To ensure the required availability of highly specialised services or facilities adapted to the development of the needs of the target groups in the most specialised social area and special education area, the National Board of Social Services may [...]

Such sentences are important for the legislator, but do not have a corresponding formal semantics, thus they will be omitted (annotated as comments).

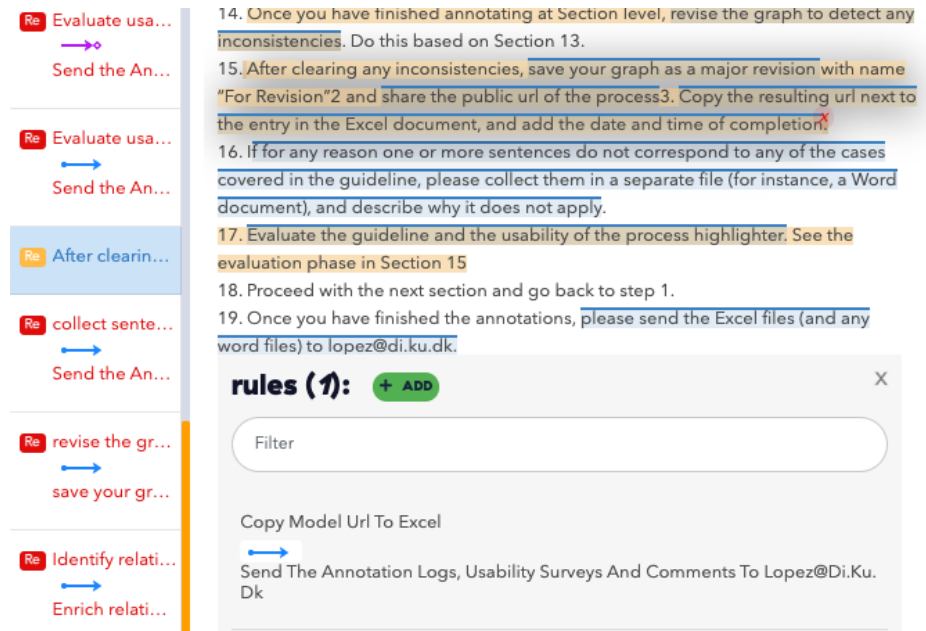


Figure 13: Reconciliation between models and highlights: resulting state

*The municipal council **shall** ensure that everybody is given the opportunity to obtain free counselling.*

While this example corresponds to a relation annotation according to the guidelines in Section 10, the sentence does not provide indication of an initial or end events. This is an *alethic* modality. The sentence is valid (and necessary) in itself, and it does not require an antecedent to be deemed obligatory⁶. As relation annotations are meant to capture the dependencies between actions, we will not annotate such cases.

Abrogations Sections that have been abrogated from the act will not have incidence in the creation of models, therefore will not be considered as valid annotations. For example:

49.-(1) (Repealed)

Contains not information to gather meaningful rules, therefore it will be commented.

⁶In DCR terms, such an event will rather be modelled as an activity with a *pending* state, and no incoming relations

15 User Evaluation

We are interested in the evaluation of the process highlighter coming from your inputs. Each of the steps you have performed should be supported by the process highlighter, and we would like to know to which degree you feel the tool has helped you to achieve your tasks. In order to do so, we would like to ask you to perform a user evaluation by answering the survey in Appendix A at the end of the annotation cycle.

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A Process Highlighter User Evaluation Survey

PARTICIPANT NAME: _____

DATE: _____

System Usability Scale

For each of the following statements, please mark one box that best describes your reactions to the Process Highlighter today.

	Strongly disagree				Strongly agree
1. I think that I would like to use the Process Highlighter frequently.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
2. I found the Process Highlighter unnecessarily complex.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
3. I thought the Process Highlighter was easy to use.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
4. I think that I would need the support of a technical person to be able to use the Process Highlighter.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
5. I found the various functions in the Process Highlighter were well integrated.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
6. I thought there was too much inconsistency in the Process Highlighter.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
7. I would imagine that most people would learn to use the Process Highlighter very quickly.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
8. I found the Process Highlighter very cumbersome (awkward) to use.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
9. I felt very confident using the Process Highlighter.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
10. I needed to learn a lot of things before I could get going with the Process Highlighter.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

Comments (optional):

B Annotation Guideline User Evaluation Survey

PARTICIPANT NAME: _____

DATE: _____

System Usability Scale

For each of the following statements, please mark one box that best describes your reactions to the annotation guideline today.

	Strongly disagree				Strongly agree
1. I think that I would like to use the annotation guideline frequently.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
2. I found the annotation guideline unnecessarily complex.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
3. I thought the annotation guideline was easy to use.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
4. I think that I would need the support of a technical person to be able to use the annotation guideline.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
5. I found the various functions in the annotation guideline were well integrated.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
6. I thought there was too much inconsistency in the annotation guideline.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
7. I would imagine that most people would learn to use the annotation guideline very quickly.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
8. I found the annotation guideline very cumbersome (awkward) to use.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
9. I felt very confident using the annotation guideline.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
10. I needed to learn a lot of things before I could get going with the annotation guideline.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

Comments (optional):