Annotating and Querying Content within Machine-readable Legal Instruments

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CODEX Presentation Online
May 23, 2019
Part I

What we did and Result
Aim

• Translate legislation from source text to a formal, machine-readable language for rules, LegalRuleML.

• Contributes to automated translation by creating a gold standard.

• Presented this work to Legal Counsel offices in:
  • Scottish Government
  • Welsh Government
  • UK Government
Our Approach

• Start with ‘lightweight’ and ‘high-level’ semantic annotations.
• Goal-oriented to address user questions.
• *Interesting point: still many (practical and interpretive) issues arise with coarse-grained annotations.*
Overview - Pilot project on Scottish Smoking Legislation

- Components
  - corpus
  - queries
  - annotations/model in LegalRuleML
- Visualisation and search
- A ‘middle way’
  - enough LegalRuleML to be useful to the target audience
  - lightweight to facilitate digestion of text
  - added value (marking obligations v. linking to reparations)
  - refine to fuller LegalRuleML
Pilot Project Scottish Smoking Legislation

1. Material – small, cohesive corpus
2. Aim – find Scottish Ministers powers, compare clauses across document, check consistency of expression
3. Action – annotate and query content
4. Agents – drafters (how get help to revise, analyse, and relate), the public (what is in the law), businesses (how does the law bear on processes and compliance), other government agencies (how is the law relevant to my department)

On Annotation of the Textual Contents of Scottish Legal Instruments

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http://ebooks.iospress.nl/publication/48050
Smoking Corpus

- 2010ActAsAmended.docx - Tobacco and Primary Medical Services (Scotland) Act 2010 asp 3
- asp_20100010_en.docx - Interpretation and Legislative Reform (Scotland) Act 2010
- asp_20160003_en.docx - Smoking Prohibition (Children in Motor Vehicles) (Scotland) Act 2016
- asp_20160014_en.docx - Health (Tobacco, Nicotine etc. and Care) (Scotland) Act 2016
- ssi_20100406_en.docx - The Sale of Tobacco (Prescribed Document) Regulations 2010
- ssi_20100407_en.docx - The Sale of Tobacco (Register of Tobacco Retailers) Regulations 2010
- ssi_20110023_en.docx - The Sale of Tobacco (Registration of Moveable Structures and Fixed Penalty Notices) (Scotland) Regulations 2011
- ssi_20110132_en.docx - The Sale of Tobacco (Display of Warning Statements) (Scotland) Regulations 2011
- ssi_20130085_en.docx - The Sale of Tobacco (Display of Tobacco Products and Prices etc.) (Scotland) Regulations 2013
- ssi_20170050_en.docx - The Sale of Tobacco and Nicotine Vapour Products by Persons Under 18 (Scotland) Regulations 2017

Scope so it is manageable and comprehensible, then scale up.
Smoking Prohibition (Children in Motor Vehicles) (Scotland) Act 2016

2016 asp 3

The Bill for this Act of the Scottish Parliament was passed by the Parliament on 17th December 2015 and received Royal Assent on 21st January 2016

An Act of the Scottish Parliament to prohibit smoking in private motor vehicles in the presence of children, subject to limited exceptions; and for connected purposes.

1 (1) It is an offence for an adult to smoke in a private motor vehicle when—
   (a) there is a child in the vehicle, and
   (b) the vehicle is in a public place.

(2) Subsection (1) does not apply to a private motor vehicle that is designed or adapted for use as living accommodation and which, at the time the smoking occurs, is parked and is being used as living accommodation.

(3) A person who commits an offence under subsection (1) is liable on summary conviction to a fine not exceeding level 3 on the standard scale.

2 Fixed penalties
   The schedule provides for fixed penalties for offences under section 1.

3 Powers to enter and require information
   (1) An authorised officer of a local authority may enter and search a private motor vehicle which is parked within the area of the local authority in order to ascertain whether an offence under section 1 has been or is being committed there.

   (2) A person who—
      (a) an authorised officer of a local authority reasonably believes—
         (i) is committing or has committed an offence under section 1, or
         (ii) has information relating to such an offence, and
      (b) fails without reasonable excuse to supply the officer with the person’s name and address on being so required by the officer,
Sample Queries

• What are the offences and associated penalties or defences?
• What prohibitions apply to tobacco products?
• What obligations have been placed on what entities, e.g. shop owners?
• What permissions are given to Scottish Ministers?
• Given a provision, what are related overriding or reparation provisions?

Scope so it is manageable and comprehensible, then scale up.
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Annotations

- Clauses and relations in the smoking corpus has been annotated with:
  - Permission (prescriptive norm)
  - Obligation (prescriptive norm)
  - Prohibition (prescriptive norm)
  - Constitutive (definition)
  - Override (expresses ‘exception’)
  - Reparation (a relation between a prescription and a penalty; penalty is triggered when the prescription is violated)
  - Penalty
  - Number as index (optional)

- Definitions from the *LegalRuleML Core Specification* document.
Model

The set of annotations (classifications of text and relations between classified text) constitute a

*model of the text*

which represents an understanding of the meaning, relevance, and use of text.

Annotating the text with respect to a model creates an instantiation of the model.

You can choose or create another model for other meanings, relevance, and uses.
Annotated text to LegalRuleML

• Documents in the corpus were manually annotated with respect to the model.
• The annotated documents were imported into LegalRuleML.
• The LegalRuleML documents can be visualised and queried on the web.
• Sample LegalRuleML later if there is time.
Visualisation and Search

• Searching for provisions in terms of semantic class and terminology.
• Finding connected provisions (or connected parts of a provision).
• Gathering information that is distributed across the corpus, which might otherwise be hard to find or understand.
LegalRuleML Search tool

This is a simple web application which allows us to browse and search through a corpus of legal documents which are annotated with LegalRuleML.
### Documents List

<table>
<thead>
<tr>
<th>Document Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010AsAmended_EO_AF_AW_R5.xml</td>
</tr>
<tr>
<td>criminalprocedure_1995_48_section_325_LS_EO_AW_AA.xml</td>
</tr>
<tr>
<td>ssi_20130085_en_LS_EO_AW_AA.xml</td>
</tr>
<tr>
<td>asp_20150003_en_EO_AF_AW_AA.xml</td>
</tr>
<tr>
<td>ssi_20130030_en_LS_EO_AW_AA.xml</td>
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<tr>
<td>ssi_2010427_en_EO_AF_AW_AA.xml</td>
</tr>
<tr>
<td>ssi_2010406_en_LS_EO_AW_AA.xml</td>
</tr>
</tbody>
</table>

The documents list page. Download or click to see visualisation.
Tobacco and Primary Medical Services (Scotland) Act 2010 cap 3 (Scottish Act) Part 2 TOBACCO AND NICOTINE VAPOUR PRODUCTS ETC: Chapter 1 DISPLAY, SALE AND PURCHASE Display of tobacco products etc.

1 Prohibition of tobacco displays etc.

[fn1] A person who is in the course of business displays or causes to be displayed tobacco products or smoking related products in a place where tobacco products are offered for sale commits an offence.

Overridden by [fn2] [fn3]
Has reparation: [fn5]

[fn2] A person does not commit an offence under subsection (1) if the display - (a) is in a specialist tobacconist, (b) does not include cigarettes or hand-rolling tobacco, - and (c) Complies with any prescribed requirements.

Overridden [fn1]

[fn3] A person does not commit an offence under subsection (1) if (a) the tobacco products or smoking related products are displayed in the course of a business involving the sale of tobacco products only to persons who carry on a tobacco business (or their employees), - and (b) the display complies with any prescribed requirements.

Overridden [fn1]
Followed a link to a reparation.

There are links between statements and penalties and parts of a reparation.
The Search page. Results for search on obligations.
Searched for the string “Scottish Ministers” in passages with the permission annotation.
Answers: “What permissions are given to Scottish Ministers?”
**Advanced Search Examples**

- **Find tokens which are not part of a longer token sequence:**
  
  "tobacco" not in "tobacco product"

- **All words in the string need to be found:**
  
  "Scottish Ministers make the following Regulations" all words

- **Any word contained in the string need to be found:**
  
  "Scottish Ministers make the following Regulations" any word

- **All strings need to be found:**
  
  ["Scottish Ministers", "make", "Regulations"] all

- **Words are found in the specified order and results are returned if there are at most eight words between tobacco and regulations.**
  
  "tobacco regulations" all words ordered distance at most 8 words

- **The occurs keyword comes into play when more than one occurrence of a token is to be found. Various range modifiers are available: exactly, at least, at most, and from ... to ....**
  
  "act" occurs at least 4 times

- **The keywords ftand, ftor and fnot can also be used to combine multiple query terms.**
  
  { "Medical", 'regulations'} all ordered distance at most 3 words

- **The window keyword accepts those texts in which all keyword occur within the specified number of tokens.**
  
  { "tobacco", 'regulations'} all window 7 words

- **Sometimes it is interesting to only select texts in which all searched terms occur in the same sentence or paragraph.**
  
  { "sale of tobacco", 'regulations'} all words same sentence

- **If case is insensitive, no distinction is made between characters in upper and lower case. By default, the option is insensitive: it can also be set to sensitive.**
  
  { "sale of tobacco", 'regulations'} all words using case sensitive same sentence
Uses of Results

• Check alternative linguistic forms:
  • must, may, duty, required
• Identify if there are missing LegalRuleML relations, e.g. conditions distributed across text.
• Analyse subportions of text.
• Provides a ‘first draft’ for further LegalRuleML analysis.
Plus Point – Jurisdictional Distinctions between England and Wales

Issues about what laws are applicable within Wales and over which Wales has competence.

• The text in connection to jurisdictions is complex and dense.
• There are threads of dependencies, which may not always have an explicit reference.
• Jurisdictional applicability sometimes needs to be inferred.
• There are ‘legal dead ends’.
• Want to be able to ‘test out’

Can make a series of questions, annotations, and links to work with this. Encode drafters knowledge for drafters uses.

Thanks Terry Kowal, Welsh Govt. (errors or misrepresentations are mine)
Part II

How we did it
What We Did

• Manually annotate a corpus of Scottish legislation and regulation in a subpart of LegalRuleML.
• Transform to technical LegalRuleML.
• Once formally annotated, analysts can use a computer to query, link, reprocess, and transmit information.
• Facilitates analysis across the corpus.

• A small team of students, cooperation with legal drafters, Trello, Google Docs, annotation manual, limited annotations, development cycle, gold standard corpus....
Smoking Prohibition (Children in Motor Vehicles) (Scotland) Act 2016

The Bill for this Act of the Scottish Parliament was passed by the Parliament on 17th December 2015 and received Royal Assent on 21st January 2016.

An Act of the Scottish Parliament to prohibit smoking in private motor vehicles in the presence of children, subject to limited exceptions; and for connected purposes.

1 Offence of smoking in a motor vehicle with children

   (1) [prohibition 1] It is an offence for an adult to smoke in a private motor vehicle when—

       (a) there is a child in the vehicle, and

       (b) the vehicle is in a public place. [prohibition]

   (2) [prohibition 2] Subsection (1) does not apply to a private motor vehicle that is designed or adapted for use as living accommodation and which, at the time the smoking occurs, is parked and is being used as living accommodation. [prohibition]

   (3) [prohibition 3] A person who commits an offence under subsection (1) is liable on summary conviction to a fine not exceeding level 5 on the standard scale. [prohibition]

2 Fixed penalties

   [Constitutive 4] The schedule provides for fixed penalties for offences under section 1. [Constitutive]
<lrml:Comment> Tobacco and Primary Medical Services (Scotland) Act 2010 asp 3 (Scottish) TOBACCO AND NICOTINE VAPOUR PRODUCTS ETC. Chapter 1 DISPLAY, SALE AND PURCHASE Display products etc. </lrml:Comment>

<!-- Legal Source -->

<lrml:LegalSources>
    <lrml:LegalSource key="src1" sameAs="../Corpus/2010ActAsAmended_EO_OT.docx"/>
</lrml:LegalSources>

<lrml:Statements key="stmts1">
    <lrml:Comment> 1 Prohibition of tobacco displays etc. </lrml:Comment>
</lrml:Statements>
<!-- Prescriptive Statement: 1 -->
<lrml:PrescriptiveStatement key="ps1">
<ruleml:Rule>
<ruleml:then>
<lrml:Prohibition>
<lrml:Paraphrase> A person who in the course of business displays or causes to be displayed tobacco products or smoking related products in a place where tobacco products for sale commits an offence. </lrml:Paraphrase>
</lrml:Prohibition>
</ruleml:then>
</ruleml:Rule>
</lrml:PrescriptiveStatement>

<!-- Prescriptive Statement: 2 -->
<lrml:PrescriptiveStatement key="ps2">
<ruleml:Rule>
<ruleml:then>
<lrml:Permission>
<lrml:Paraphrase> A person does not commit an offence under subsection (1) if the display (a) is in a specialist tobacconist, (b) does not include cigarettes or hand-rolled tobacco products and (c) Complies with any prescribed requirements. </lrml:Paraphrase>
</lrml:Permission>
</ruleml:then>
</ruleml:Rule>
</lrml:PrescriptiveStatement>

<!-- Override -->
<lrml:Override over="#ps2" node="#ps1">
<lrml:Override>
</lrml:Override>
</lrml:OverrideStatement>
Various issues: only the prescription mentioned, not the related penalty.
LegalRuleML Virtues

• Extensible (add more parts of an analysis)
• Revisable (can change XML)
• Refinable (take a rough draft and refine it)
• Maintainable (a text file)
• Transmittable (available on the web)
• Linkable (connect one XML file to another anywhere on the web)
Thanks for your attention!

• Contact:
  Adam Wyner, a.z.wyner@swansea.ac.uk
• Comments, questions, suggestions....