

# Time and Versions in <sup>META</sup>LEX XML

Alexander Boer      Rinke Hoekstra      Radboud Winkels  
Tom van Engers\*      Matthijs Breebaart†

## Abstract

<sup>META</sup>Lex provides a generic and easily extensible framework for the XML encoding of the structure and contents of any type of regulation. This paper discusses some design decisions related to timekeeping and versions. Version management guidelines for legislation are typically codified in legislation or considered part of customary law. This obviously makes them jurisdiction-specific, although there are common requirements. Our point of view is that we try to find common requirements by looking at the functions of specific timestamping and versioning practices. If we cannot properly support a certain kind of function we do not try to provide XML facilities for that function, but leave the issue open for other extensions to the schema.

## 1 Introduction

The <sup>META</sup>Lex XML schema (cf. [1]) is intended to provide a generic and easily extensible framework for the XML encoding of the structure and contents of written public decisions, or public legal documents that can be characterized as rules of conduct. The schema makes only minimal requirements on the structure of documents. The schema adopts, as far as practicable, relevant guidelines and standards of the World Wide Web Consortium (W3C).

<sup>META</sup>Lex schema is intended for marking up the structure of documents, and adding information *about the document*. With the notable exception of references, the <sup>META</sup>Lex schema does not allow its user to use the schema to specify what the document *is about* because there are more suitable knowledge representation technologies for that purpose.

This paper discusses design decisions related to timekeeping and version management. Version management guidelines for legislation are typically codified in legislation or considered part of customary law. This makes them jurisdiction-specific, although there are common requirements. Throughout this text we will refer to relevant Dutch legislation about legislative drafting.

We try to find common requirements by looking at the functions of specific timestamping and versioning practices. If we cannot properly support a certain kind of function in the XML schema we do not try to provide XML facilities for that function, but leave the issue open for extensions to the schema.

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\*Leibniz Center for Law, University of Amsterdam, The Netherlands

†Dutch Tax and Customs Administration, The Netherlands

## 1.1 Types of Timestamps in Legislation

A shared feature of legislation in all jurisdictions known to us is that all use discrete ‘timepoints’ in the form of a date. Roughly, one can distinguish three kinds of timestamps used in legislation:

**Version management** These timestamps define the validity of the document for reference, and the validity for application in the (narrow) sense that the document can be applied by a competent decisionmaker in the time-interval in which it is active.

**Legislative Drafting** These timestamps relate to the procedures that have to be followed by the legislator. In addition to spurious timestamps for certain events (signing, etc.), there are usually rules for minimum time intervals that must have elapsed etc.

**Application to cases** These timestamps try to define what objects in the outside world legislation refers to. Rules relating to traffic for instance usually deal with immediate events that take negligible time, but other legislation often deals with persistent ‘objects’ like cars, mortgage loans, and pension arrangements, or delayed payoffs of choices (for instance financial products exempt from certain kinds of taxation). The latter type of legislation has to deal with transitory regimes to minimize the damage of changes in legislation to society. Notions like ‘retroactive application’ generally belong in this category.

<sup>METALex</sup> is not suitable for enforcing rules in legislative drafting, since it aims to be jurisdiction-independent.

<sup>METALex</sup> is also not suitable for knowledge representation of the contents of the document, and we doubt that a standard for formal representation of the contents of legislation is feasible at this time. Straightforward XML is not suitable for the representation of things like norms, time, and agency.

Wellknown design patterns like *retroactive application* (e.g. Dutch Guidelines for legislative drafting (AR, aanwijzing 167), *immediate application* (AR, aanwijzing 166), *delayed application* (to allow evasive action; AR, aanwijzing 169), and ‘*honouring*’ *application* (where a certain existing state of affairs is honoured, while the rules apply only to ‘new’ cases; AR, aanwijzing 169) apply to time attributes of persistent objects in the regulated world, and not the legislation itself.

UML or OWL models of norms – including related timestamps, of course – can be linked to, or embedded in <sup>METALex</sup> document elements. The relation between the contents of the document and the ‘real world’ is outside the scope of <sup>METALex</sup>.

## 2 Citation and Version Maintenance in <sup>METALex</sup>

The <sup>METALex</sup> schema distinguishes publications and organic documents, and facilitates the connection of organic documents (the *latest* version, for instance) to semi-permanent universal resource identifiers (URI), similar to the way in which the World Wide Web Consortium (W3C) makes its standard documents and schemata available. Most web sites that publish legislation for free fail to qualify *which version* they offer. We distinguish two distinct views on the identity of versions of legislative documents:

**Publication** A document that has been published through a designated channel, and is identified by that channel, a designation relative to that channel, and a publication date. A publication obviously never changes and references to it remain correct.

**Organic form** A document that is a (virtual) reconstruction of a regulation designated by a globally unique citation title or acronym as it exists at a certain point in time. Indexed parts or full sentences of an organic regulation can be modified, inserted, or retracted by another publication. To reference an organic regulation it must be clear whether the reference concerns the latest version of the regulation, the regulation at the time the reference was made, or the regulation at a specified timepoint.

To make a correct citation to a part of an organic regulation identified by a URI is still not trivial; index symbols usually suggest an ordinal relation between indices, but there is no way to determine the size of the interval between for instance articles I and IV. A citation of the ‘second article’ is therefore not the same as a citation of ‘article 2’ because ‘article 1bis’ may be inserted later<sup>1</sup>.

The importance of capturing the identity criteria for regulations is also made apparent by considering the requirements for maintenance of a collection of organic regulations in time. Changes in laws are announced in separate decisions and publishers must keep track of all documents from certain publication channels to be able to reconstruct what the form of an organic regulation is at some time point. The notion of a publication is not very problematic, but the treatment of the version identity of ‘organic’ acts is jurisdiction-specific, and sometimes governed by law and sometimes governed by custom.

The following sections discuss timestamping of document elements, timestamping of references, and version management requirements of Dutch Law.

## 2.1 Timestamping Document Elements in <sup>META</sup>Lex

To keep track of versions <sup>META</sup>Lex provides a number of attributes for every structural XML element in the document that can be identified, selected, and thus changed; the *date-publication* of an element is the time the element is officially published or announced, in the sense that the element becomes an entity at that point in time to which references can be made from outside the containing document. Because this is the only relevant requirement we know of, we consider other distinctions (date of signing by the Majesty, or date of some vote in parliament) superfluous embellishments in the context of document management. Version management requirements for proposed new legislation before it is published do not differ substantially from those of standard document management.

The *date-enacted*, the time the content becomes applicable in decisionmaking, is always later than or the same as *date-publication*, but before *date-repealed*, the time the content becomes inapplicable in decisionmaking. Between *date-enacted* and *date-repealed* the element and its content is *active*, and outside this interval it is *inactive*. Table 1 can be used to deduce active time intervals from the presence or absence of these attributes. The *date-version* attribute represents the date the correctness of the content and other dates of the XML element was last verified. The XML document

<sup>1</sup>A necessary practice when printing was expensive, search engines non-existent, and correcting existing references to articles almost impossible. Updating the references to indices in the memory of legal professionals is still a problem today.

date-publication	date-enacted	date-repealed	active
$t_1$	$t_2$	$t_3$	$[t_2, t_3]$
$t_1$	$t_2$	-	$[t_2, t_{future}]$
-	-	$t_1$	$[t_{past}, t_1]$
-	-	-	<i>none</i>
$t_1$	-	-	$[t_1, t_{future}]$
$t_1$	-	$t_2$	$[t_1, t_2]$
-	$t_1$	-	$[t_1, t_{future}]$
-	$t_1$	$t_2$	$[t_1, t_2]$

Table 1: Active time intervals

gradually loses its value as a normative reference as time progresses and the time interval between date-version and today increases – in the same way that a paper version of new legislation slowly starts to lose its value as a reference as soon as it is published.

An XML element in a newly published regulation refers to another XML element to repeal, enact, or change it. Conversely, if a law, delegation decision, or mandate decision becomes inactive, XML elements referring to it as a source of legislative power also become inactive (in the Netherlands). META Lex only provides representational primitives that adequately describe relations of this nature between regulations without commitment to a specific normative ‘model’ for updating documents; it is not sufficient to validate proposed changes or to establish the applicability of a certain article to a legally qualified fact.

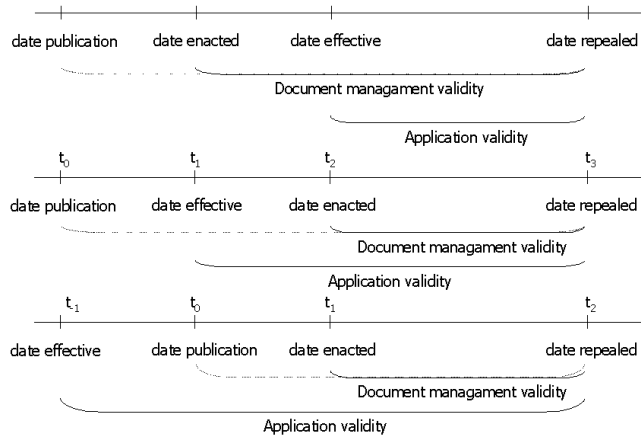


Figure 1: Relation between document validity time intervals and application validity time intervals.

The *date-effective* attribute is a date at which a (part of a) regulation becomes effective (for some external purpose). This attribute can be set to specify that a new provision is applied to cases pending at the time of the regulation’s enactment. If a regulation sets an effective date before the date of publication and enactment, this effective date refers to the date at which certain acts have occurred. It is not intended to mean that a court can apply the regulation before it is published or enacted. The relation between document management validity time intervals and application validity time intervals is shown in figure 1. It is common in the legal profession to consider

retroactive application as enactment before publication, but for the purposes of this schema this view is not defensible.

The dates set on text elements in <sup>META</sup>Lex are primarily intended for versioning and verification of the integrity of hyperlinks. The relation between the time interval set in a text element and the time point at which some relevant event happened, or time interval in which some state pertains, is a very complex problem that relates to the things the document is about. The *date-effective* attribute has been added on request, and its use is not recommended.

Treating *date-enacted* and *date-effective* as ‘virtually’ equivalent is not allowed in all jurisdictions. Obviously, ex post facto laws are regarded as subversive to justice. As David Hume put it (on the trial of Strafford in 1641): “Better to live under no law at all, and conform ourselves the best we can, to the arbitrary will of a master, than fancy we have a law on which we can rely, and find at last, that this law shall inflict a punishment precedent to the promulgation, and try us by maxims unheard of till the very moment of prosecution”.

Prohibition of sanction based on ex post facto law is implicit in “nulla poena sine lege” clauses all over the world (for instance in the Constitution of the United States, art. 1, sub 9, cl. 3 and sub 10, cl. 1, or German and Dutch criminal codes, both title 1, art. 1, sub 1). As a general rule, retroactive application of provisions that are harmful to anyone are considered taboo. On the other hand, one can argue that it is sometimes just to apply a new regulation retroactively because the legislator has become more enlightened in time<sup>2</sup>.

Provisions for legislative drafting in the Netherlands prohibit the use of a ‘fictional’ date of enactment to indicate the possibility of retroactive application (AR, aanwijzing 168, lid 1). Retroactive application is always explicitly related in the text of the regulation to the things it applies to.

Note that *date-effective* timestamps can be specified in many indirect ways: parts of a regulation can become effective at different times (as part of a transitory regime), legislation can specify that the date at which it becomes valid is announced by Royal Decree, or that it becomes effective when some other legislation becomes effective. These examples have been taken from Dutch law (AR, aanwijzing 180).

Finally, the *date-version* attribute represents the date the correctness of the content and other dates of the <sup>META</sup>Lex element was last verified. This attribute is attached to the root element in a document. An element is considered verified for a certain date if it is certain that the content of the element and the dates set in its attributes and attributes of child elements (insofar as date attributes are set) are a correct representation at that date for the regulation or decision encoded. In case of an organic law, for instance, this means that to produce a ‘versioned’ document one must keep track of changes and retractions of articles and parts of articles of that law in the interval from the last ‘version’ that was verified to the date that is to be assigned to the new version.

These attributes are all optional and are not set unless it is certain that the value is correct. Dates that are set thus represent a degree of trust that the document is an accurate representation of reality at date-version that the editor that created the document wishes to convey to the user. It is also obvious that the document loses its value as a normative reference as time progresses and the time-interval between date-version and today increases.

The importance of keeping track of the relations between various documented decisions published by public bodies is made clear by considering the requirements for

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<sup>2</sup>The Nuremberg trials are for instance justified with this argument

verification of the date-version of a collection of documents. In a fast moving domain of law like the tax domain it is quite a job to keep track of these changes. If a document element in a newly published document refers to another element, it is important to verify whether the text in the element repeals or enacts the other element, but such a classification cannot be taken for granted). An element may also refer to another element to invoke its 'power'. This is the case if the official author of the document obtains the power to take the decision(s) communicated in the document from a specific assignment by law, a delegation decision, or a mandate decision. Note that in such cases the element, or an ancestor element, usually becomes inactive if the element from which the power is obtained becomes inactive.

This last rule is at least true in regulations from public bodies in the Netherlands (AR, aanwijzingen 243-245).

## 2.2 Timestamping References in <sup>META</sup>Lex

Not only document elements are timestamped. A reference to (a part of) a regulation is also optionally timestamped with the *ref-date* attribute. If a *ref-date* attribute is present, then the reference only refers to the version of the document at *ref-date* – which is usually equal to the date the referring document was published. If the *ref-date* is not present, then the reference at any time refers to the version at that time.

This simple solution meets the two requirements that we set for timestamps of references:

- It allows the distinction between static and dynamic references.
- A static reference can point to either the version existing at the timepoint when the reference was made, or to any other desirable version.

These requirements are based on Dutch legislation for legislative drafting (AR, aanwijzing 92).

## 2.3 Version Management Requirements in Dutch Law

This small set of dates is, as far as we know enough to establish validity in most European jurisdictions. Other common dates (distinguishing the date of signing and publishing the law, for instance) have no bearing on validity.

The importance of capturing the relations between the various documented decisions published by public bodies is made clear by considering the requirements for a correct update of a collection of documents. These requirements are sometimes informal, but in many jurisdictions these requirements have the status of law. The following list is a condensed interpretation we made of what the General Administrative Act (Awb) and the Guidelines for Legislative Drafting (AR), the relevant legislation in the Netherlands, have to say on the subject of change of decisions:

- The title, introduction, and ordering that identify (elements of) a decision cannot be changed.
- Retraction and change of a decision are made explicit in a later decision.
- Changes occur to whole grammatical and conceptual units of a decision.

- Norms created by a decision based on a power attributed by a norm that is later retracted are deactivated, unless norms are changed or created to re-establish the attributed power.
- Norms that are not active are not retracted.
- A decision can be changed by a later decision of equal order.
- A decision can be retracted by a later decision of equal or higher order if it is not replaced by a later decision of equal order.
- The retraction of a norm that changed an earlier norm does not undo the change.
- The retraction of a norm that deleted an earlier norm or made it inactive does not undelete or activate it.

This list can be encoded as a set of norms regulating document collections. To make a full document management system for a specific jurisdiction, it is necessary to make such a set of norms for updating documented decisions in that jurisdiction.

### 3 Discussion

A lesson we learned about META<sub>Lex</sub> is that you are often left with almost trivial schemes when you exclude everything that is jurisdiction-specific. Content management systems that can deal with the ‘legal’ update rules will necessarily be jurisdiction-specific, unless they manage to distinguish between a sufficiently general vocabulary and separate sets of rules of a specific jurisdiction.

We hope that others will apply the schema to new legislative documents and report problems with our jurisdiction-neutral vocabulary to the META<sub>Lex</sub> discussion mailing list.

Trying to specify when a legal document applies to what kind of thing in the outside world is a very interesting task, and the traditional domain of Deontic Logic and Artificial Intelligence & Law. Attempts to solve this problem with date attributes in an XML schema is ill-advised.

Currently, we are working on a feasibility study for a knowledge management infrastructure including document and version management functionality based on META<sub>Lex</sub> for the Dutch Tax and Customs Administration. We are also in the final stages of the acquisition of a similar project for the Council of State of the Netherlands. This project will be focused on administrative case law instead of regulations.

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We are working on a feasibility study for a knowledge management infrastructure including document and version management functionality based on META<sub>Lex</sub> for the Dutch Tax and Customs Administration. This paper was written in the context of that project.

## References

- [1] A. Boer, R. Hoekstra, R. Winkels, T. van Engers and F. Willaert, '*META Lex: Legislation in XML*', in Legal Knowledge and Information Systems (Jurix 2002), 1–10, (2002), IOS Press.