

Introduction to TEI schemata

Antidote workshop, Klosterneuburg & Lyon

Matthias GILLE LEVENSON

Université Versailles Saint Quentin (UVSQ) & École Normale Supérieure de Lyon, France

matthias [dot] gille [-] levenson [at] ens-lyon [dot] fr

- 1 Introduction
- 2 Schemata
- 3 Conclusions
- 4 Exercise
- 5 One more thing: ODDbyexample

Where to find these slides

- https://github.com/matgille/Antidote_workshop_2025_ODD.git

1 Introduction

■ The XML format

- What is the TEI?
- Principles
- The TEI, what for ?

Conformance and validity

- XML stands for eXtensible Markup Language.
- It is a format that allows to describe any kind of textual (or numeric) data
- It is the actual *format* the TEI uses, but it might change/evolve in the future.

Two important concepts: Conformance and validity

- A document **must** be XML conformant, that is, respect the rules of the XML format
- A document **may** be validated against a given **schema**, that is a document that checks given rules are respected
- Some examples of specifications: TEI, EAD, DublinCore, AltoXML, PageXML, RDF, etc...
- Along with validity comes another important concept/nightmare: *namespaces*. You'll understand soon enough.

Conformance

- XML is composed of elements, attributes, attribute values and text.

```
<?xml version="1.0" encoding="UTF-8"?>
<TEI xml:id="drp" xmlns="http://www.tei-c.org/ns/1.0">
  <teiHeader>
    <fileDesc>
      <titleStmt>
        <author cert="low">Matthias Gille Levenson</author>
      </titleStmt>
      <publicationStmt>
        <publisher>Unpublished</publisher>
        <availability>
          <licence>Creative Commons CC BY-NC-SA 4.0 FR</licence>
        </availability>
      </publicationStmt>
    </fileDesc>
  </teiHeader>
</TEI>
```

Figure: This is *correct* XML (but incorrect/incomplete TEI)

Recap: vocabulary

Four main objects (called *nodes*):

- **Element** nodes: the basic object of any XML document:
`<elementName/>` or `<elementName>...</elementName>`
- **Attribute** nodes: part of an element that helps specifying it:
`attributeName="value"`
- **Text nodes**: every textual object inside an element
- **Comment** nodes: content not parsed by the machine:
`<!-- some useful comment -->`

The root node/element

- One and only one top element that contains everything else

```
<?xml version="1.0" encoding="UTF-8"?>
<TEI xml:id="drp" xmlns="http://www.tei-c.org/ns/1.0">
  <teiHeader>
    <fileDesc>
      <titleStmt>
        <author cert="low">Matthias Gille Levenson</author>
      </titleStmt>
      <publicationStmt>
        <publisher>Unpublished</publisher>
        <availability>
          <licence>Creative Commons CC BY-NC-SA 4.0 FR</licence>
        </availability>
      </publicationStmt>
    </fileDesc>
  </teiHeader>
</TEI>
```

Figure: This is *correct* XML (but incorrect/incomplete TEI)

Conformance

- No overlapping elements

```
<?xml version="1.0" encoding="UTF-8"?>
<TEXT xml:id="drp" xmlns="http://www.tei-c.org/ns/1.0">
    <NODE_A>Hello <NODE_B>World</NODE_A></NODE_B>
</TEXT>
```

Figure: This is *incorrect* XML

Conformance

- Some elements can contain other elements, but elements can also be empty

```
<?xml version="1.0" encoding="UTF-8"?>
<div type="chapitre" n="1">
    <lb/>ca . i. quomodo diuiduntur potentiae
    <lb/>anime et inquibus potenciis
    <lb/>habent esse
    <lb/>uirtutes
</div>
```

Figure: This is *correct* XML

Conformance

- Attribute values must be inside quotes

```
<?xml version="1.0" encoding="UTF-8"?>
<TEXT>
    <NODE_A type=sentence>Hello
        <NODE_B>World</NODE_B>
    </NODE_A>
</TEXT>
```

Figure: This is *incorrect* XML

Conformant or not ?

```
1 <sentence>Longtemps, je me suis couché de bonne heure.</sentence>
2
3 <sentence>Longtemps, je me suis couché de bonne heure.</sentence>
4
5 <sentence type=incipit>Longtemps, je me suis couché<linebreak></linebreak> de bonne heure.</sentence>
6
7 <sentence type=incipit>Longtemps, je me suis couché<linebreak/> de bonne heure.</sentence>
8
9 <sentence>Longtemps, je me suis couché de bonne heure.</sent>
10
11 <sentence type="incipit">Longtemps, je me suis couché de bonne heure.</sentence>
12
13 <paragraph>
14     <sentence type="incipit">Longtemps, je me suis couché <strikethrough>de bonne heure.</sentence>
15     <sentence>Parfois, à peine ma bougie éteinte</strikethrough>,
16         mes yeux se fermaient si vite que je n'avais pas le temps de me dire</sentence>
17 </paragraph>
18
19 <paragraph>
20     <sentence type="incipit">Longtemps, je me suis couché <strikethrough>de bonne heure.</strikethrough></sentence>
21     <sentence><strikethrough>Parfois, à peine ma bougie éteinte</strikethrough>,
22         mes yeux se fermaient si vite que je n'avais pas le temps de me dire</sentence>
23 </paragraph>
24
```

1 Introduction

- The XML format
- **What is the TEI?**
- Principles
- The TEI, what for ?

What is the TEI?

- A community
- A “standard” and a set of rules, the Guidelines:
<https://tei-c.org/release/doc/tei-p5-doc/en/html/>
- A way of seeing/modelling “the” text

1 Introduction

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■ Separate the appearance and the “essence” of textual objects

del mal del otro o del buen zelo³. Si del mal, cuidando que non devía el omne sofrir tal mal, esta es misericordia, ca misericordia non es otra cosa sinon tristeza del mal que omne sufre sin meresçimiento, segund que dize el philósofo en el IIº de la *Retórica*; mas si toma tristeza del bien, esto es en dos maneras, ca o le pesa del bien que otri ha, maguer que lo él meresca de aver, e esta es enbidia, ca enbidia non es otra cosa sinon // [Fol. 176r] dolor o tristeza del bien que otro ha⁴; [mas si le pesa del bien que otro ha] porque lo non meresçe aver, (e) así es némesis o

³ del buen zelo] del bien *Glosa*.

⁴ En este punto ha producido un salto de texto de igual a igual respecto a la *Glosa*, donde se lee seguidamente el texto que transcribo entre corchetes, que es necesario para que el sentido del pasaje no quede truncado.

⁵ [a los mayores]] *om. Castigos* respecto a la *Glosa*.

Figure: Fragment of an edition of the *Castigos de Sancho IV* (Marín Sánchez 2003)

- Separate the appearance and the “essence” of textual objects

```
<p>del mal del otro o
<app>
  <lem>del buen zelo</lem>
  <rdg wit="#Glosa">del bien</rdg>
</app>
. Si del mal, cuidando que non devía el omne sofrir tal mal, esta es misericordia, ca
misericordia non es otra cosa sinon tristeza del mal que omne sufre sin meresçimiento,
segund que dize el philósofo en el llo de la Retórica; mas si toma tristeza del bien,
esto es en dos maneras, ca o le pesa del bien que otri ha, maguer que lo él meresca de
aver, e esta es enbidia, ca enbidia non es otra cosa sinon<pb n="176r"/> dolor o
tristeza del bien que otro ha;
<choice>
  <sic>mas si le pesa del bien que otro ha</sic>
  <corr/>
</choice>
<note>En este punto ha producido un salto de texto de igual a igual respecto a la Glosa,
donde se lee seguidamente el texto que transcribo, que es necesario
para que el sentido del pasaje no quede truncado.</note> porque lo non meresçe aver,
<supplied>e</supplied> así es némesis o desdén</p>
```

Figure: Its possible representation in XML-TEI

1 Introduction

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The TEI, what for ?

- Describing a text using the experience of a **large community**
- Producing semantic data that can be **read** by the human and **processed** by the computer
- Make sharing and reusability of these representations easier

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2 Schemata

- Interests of using schemata
 - Schemas and the TEI I
 - Schemas and the TEI II: ODD's
 - ROMA

What is the use of a schema?

- A schema checks if the data is correctly formatted.
- A schema makes assumptions about what is legal and what is illegal in an XML data structure
- Applied to some text encoding, a schema is a model of the “text”, that is, a **formal representation** of the text.
- From a pragmatic point of view, it helps harmonizing your encoding and is an **important step towards interoperability**

Integrating the schema in your encoding sessions

Some XML editors use the schema as a tool for easing the encoding:

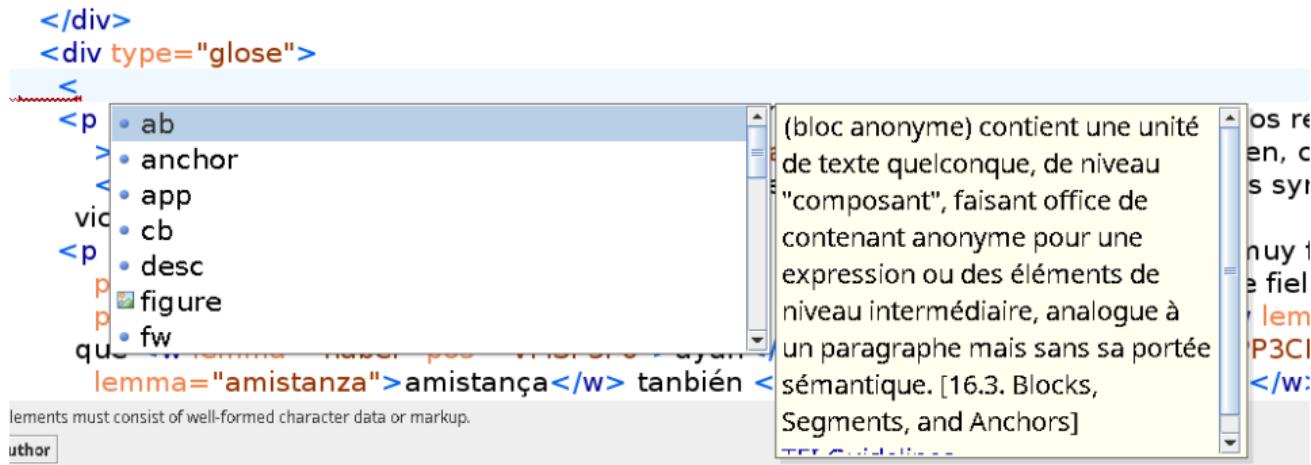


Figure: Oxygen XML Editor allows you to choose between the allowed elements

Schemas

- A schema is a document that is used to control the quality of some encoding.
- The TEI provides **rules** (the *Guidelines*, human readable), and their **formalization** (*schemas*, machine readable) to check the validity of a given document
- From an abstract point of view, the schema represents the formalization of *your* modelling of a given text or genre.

Schemas

TEI	text	body	div	div	div	lb
1803		<body>				
1804		<div type="livre" n="1">				
1805		<div type="partie" n="2">				
1806		<div type="chapitre" n="1"><pb n="" facs="../input_files/16369405.jpg"/><fw				
1807		type="titre_courant"/><lb break="?" rend="rubric"				
1808		xml:id="elem_eSc_line_99cc2a93"/> <u>Capitulum . i. Iquon diuiduntur potencie</u> <lb				
1809		break="yes" rend="rubric"				
1810		xml:id="elem_eSc_line_7f955f55"/> <u>anime et in quibus potencii habet esse virtutes.</u> <lb				
1811		break="yes"				
1812		xml:id="elem_eSc_line_6ea8e267"/> <u>ostquam auxiliante deo compleui</u> <lb break="no"				
1813		xml:id="elem_eSc_line_df9d9bc9"/> <u>mus primam partem huius primi libri in quo</u> <lb				
1814		break="yes"				
1815		xml:id="elem_eSc_line_b36db744"/> <u>agitur de regimine sui ostendentes</u> <lb break="no"				
1816		xml:id="elem_eSc_line_2c352677"/> <u>i quo reges et p̄ncipes suam felici</u> □ □ poner<lb				
1817		break="no"				
1818		xml:id="elem_eSc_line_54b88267"/> <u>e dī quia non decet eos suum finem pone in din</u> <lb				
1819		break="no"				
1820		xml:id="elem_eSc_line_a6468504"/> <u>cis. nec in ciuili potentia. nec in aliquibus</u>				
1821		<u>talibus sed omni</u> <lb break="no"				
1822		xml:id="elem_eSc_line_5efa6adc"/> <u>bus hiis ut supra plenius perba debet uti tanquam</u> <lb				
1823		break="yes"				
1824		xml:id="elem_eSc_line_33a63380"/> <u>organis ad felicitatem sed poneredz in a</u> <lb				
1825		break="no"				
1826		xml:id="elem_eSc_line_c991f46c"/> <u>ctu pruden □ prout talis actus est in patu</u> □<lb				
1827		break="yes"				
1828		xml:id="elem_eSc_line_388d53ce"/> <u>a cari</u> □ □ <u>Nam tunc reges habet felicita</u> <lb				
1829		break="no"				
1830		xml:id="elem_eSc_line_4b955e3e"/> <u>tem suo statui debitas et condignam quando</u> <lb				
1831		break="yes"				
1832		xml:id="elem_eSc_line_c422ed80"/> <u>instigante dei dilectione secundum prudentiam</u> <lb				
1833		break="yes"				

• text not allowed here; expected the element end-tag or element "ab", "addSpan", "alt", "altGrp", "anchor", "annotationBlock", "app", "argument", "bibl", "biblFull", "biblStruct", "byline", "camera", "caption", "castList",

Figure: This fragment is *well-formed*, but it is not *valid* according to the XML-TEI schema. A paragraph p or an anonymous block ab should wrap the lines.

Schema formats

There are multiple schema formats. The most important are:

- Document Type Definition (DTD), already mentionned before
- XML schema (XSD format)
- Relax NG (RNG) schemas and its compact version (RNC)

The former is less used nowadays but can prove usefull for creating shortcut elements thanks to **XML entities** (e.g. for abbreviation encoding)

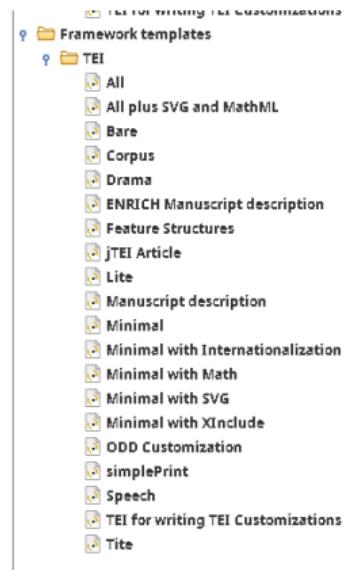
```
</div>
<div type="chapitre" n="9" xml:id="Mad_A_3_3_9">
  <head n="aPtIUVcUOv">Capítulo .ixº. <w lemma="do" pos="RG">&doblique-d;o</w>
    mue&slong-s;tra &qtrema-qua:<lb facs="#facsmBaQz" xml:id="elem_maBaQz" break="no"
    />les &e-e; quantas co<choice n="qtrema-qua" ana=
      <w><sic>pe&slong#
      #normalisation" xmlns="http://www.tei-c.org/ns/1.0"
      break="yes"/>en&rien
      quan&doblique-d;o &slid><abbr>q</abbr><expan>q<ex>ua
      xml:id="elem_mxdFHc" </ex></expan></choice>
    </div type="traduction">
```

Figure: A possible way to encode abbreviations using XML entities / DTD definitions

2 Schemata

- Interests of using schemata
- **Schemas and the TEI I**
- Schemas and the TEI II: ODD's
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TEI subsets



- There are multiple TEI schemas available.
- As a scientific standard, the TEI needs to be adapted to the users needs.

Why should you create your own TEI customization ?

- Consider the TEI as a tool to model your textual object
- You probably won't need all the intellectual tools provided by the TEI Consortium.
- As medievalists, you might want to discard the elements belonging to the “Transcriptions of Speech” section of the TEI (alas!)
- Your schema will be the formalization of your way of seeing the text, and you need it to be as specific as possible.

Two main methods

- The inclusion method: start from scratch, add the elements you need
- The exclusion method: start from a predefined schema, remove the elements you won't need

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- I would recommend to adopt the first approach...
- or at least starting from a preset specification that meets some of your interests (we'll see this later).

Two main methods

- The inclusion method: start from scratch, add the elements you need
- The exclusion method: start from a predefined schema, remove the elements you won't need
- I would recommend to adopt the first approach...
- or at least starting from a preset specification that meets some of your interests (we'll see this later).
- Mastering the Guidelines is essential to know what is possible for your project.

Don't reinvent the wheel !

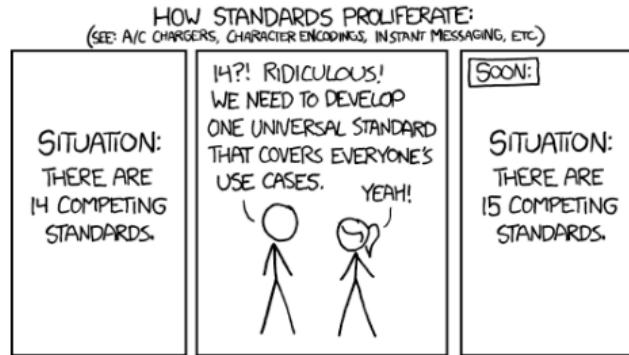


Figure: <https://xkcd.com/927/>

- You have to specify, and adapt the TEI rules to your own project
- However, the modelling problems you will face are probably *not* new
- Please don't reinvent the wheel !
- Search for what's been done for similar problems and try the provided solutions !
- And (for a start), avoid inventing/creating new elements.

2 Schemata

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Is that all, folks ?

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- What's missing then ?

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- What's missing then ? *Documentation*.

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- You want now to explain your rules to your supervisor, to your colleagues and to your children. You need to write this *in natural language*.

Is that all, folks ?

- Create a specific schema is a good start.
- What's missing then ? *Documentation*.
- You want now to explain your rules to your supervisor, to your colleagues and to your children. You need to write this *in natural language*.
- What could be better than a TEI document to describe another TEI document?

Here comes the ODD

- ODD stands for “One Document Does it All”
- An ODD is a TEI document that is used to create both the documentation and the schema in a single document.
- Important reading: Lou Burnard. “What Is TEI Conformance, and Why Should You Care?” In: *Journal of the Text Encoding Initiative 12 (2019)*. ISSN: 2162-5603

One Document to Rule Them All

An ODD contains:

- the machine-readable elements used to *validate* an edition
- the human-readable elements used to *document* it

Text Body

- ⊕ 1 [The TEI Infrastructure](#)
- ⊕ 2 [The TEI Header](#)
- ⊕ 3 [Elements Available in All TEI Documents](#)
- ⊕ 4 [Default Text Structure](#)
- ⊕ 5 [Characters, Glyphs, and Writing Modes](#)
- ⊕ 6 [Verse](#)
- ⊕ 7 [Performance Texts](#)
- ⊕ 8 [Transcriptions of Speech](#)
- ⊕ 9 [Computer-mediated Communication](#)
- ⊕ 10 [Dictionaries](#)
- ⊕ 11 [Manuscript Description](#)
- ⊕ 12 [Representation of Primary Sources](#)
- ⊕ 13 [Critical Apparatus](#)
- ⊕ 14 [Names, Dates, People, and Places](#)
- ⊕ 15 [Tables, Formulae, Graphics, and Notated Music](#)
- ⊕ 16 [Language Corpora](#)
- ⊕ 17 [Linking, Segmentation, and Alignment](#)
- ⊕ 18 [Simple Analytic Mechanisms](#)
- ⊕ 19 [Feature Structures](#)
- ⊕ 20 [Graphs, Networks, and Trees](#)
- ⊕ 21 [Non-hierarchical Structures](#)
- ⊕ 22 [Certainty, Precision, and Responsibility](#)
- ⊕ 23 [Documentation Elements](#)
- ⊕ 24 [Using the TEI](#)

- The TEI is organized by *thematic* modules

TEI as modules

- 22 modules
- Each module is binded to a list of elements. Deactivate a module and those elements won't be accessible anymore.
- 4 main modules: `tei`, `core`, `header`, and `textstructure`, almost mandatory
- The other module you might want to take a look at are: `msdescription`, (`transcr`) and `textcrit`

An ODD is NOT a schema

- It is a **TEI document** used to produce schemata.
- It needs to be **converted** to a schema (and a documentation when applicable)
- The resulting schema (in general, in RNG) is the document you will use to validate your XML documents.
- Don't try to validate your files against ODD's !

2 Schemata

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- Schemas and the TEI II: ODD's
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Producing ODD's and schemas with ROMA

- ROMA, maintained by Raffaele Viglianti (lead), Peter Stadler and Bryan Wang.
- ROMA is a simple interface for designing ODDs and creating schemas
- URL: <https://roma.tei-c.org/>

A quick look at our ODD

With ROMA, you can easily design your own ODD:

- Include or exclude specific modules
- Completely remove elements (they won't be allowed anymore)
- Constrain attribute types, or attribute values
- Make some attributes mandatory
- etc.

Producing ODD's and schemas with ROMA

- I'm interested in the encoding of a medieval manuscript. How can I create the most adapted ODD with ROMA?
- I want to make sure the user uses an attribute @n for each page beginning element (pb). How can I do ?
- I want to remove the div1, div2, ..., div7 elements, so that divisions are marked up with typed and identified div elements only.

Producing ODD's and schemas with ROMA

The screenshot shows the ROMA application interface. At the top, there is a dark blue header bar with the text "Roma - ODD Customization v1.3.0" on the left and "LANGUAGE (EN)" with a gear icon on the right. Below the header, the main content area has a light gray background. On the left side, the word "Roma" is displayed in large, bold, black font. In the center, there is a modal dialog titled "Select ODD". The dialog has two tabs at the top: "SELECT ODD" (which is active) and "UPLOAD ODD". Below the tabs, there is a section titled "Choose a preset" with a dropdown menu currently set to "TEI for Manuscript Description". To the right of this dropdown is a "Version" dropdown set to "current (4.10.2)". The main body of the dialog contains a list of ODD templates, with "TEI for Manuscript Description" highlighted in blue. Other listed templates include: TEI All (customize by reducing TEI), TEI Minimal (customize by building TEI up), TEI Absolutely Bare, TEI SimplePrint, TEI Lite, TEI Title, TEI for Linguistic Corpora, TEI with Drama, TEI for Speech Representation, TEI for Authoring ODDs, TEI for Journal of the TEI, MEI - All, MEI - All (Any Start), MEI - Common Music Notation, MEI - Mensural, MEI - Neumes, and MEI - Basic. At the bottom of the dialog, there is a note: "Roma is an ODD Editor, using the TEI ODD (see [Initiative](#)). Schema documentation and local encoding guidelines as created by the [Text Encoding Initiative](#). The old version of Roma can be found at [http://www.romaproject.org](#)". Below the dialog, the text "What it is supposed to do" is visible. At the very bottom of the page, there is a footer note: "Roma enables you to create a customization of the TEI. It provides a user-friendly interface to pick and choose Elements, Attribute Classes, Model Classes, and Datatypes used in a schema. For each element the documentation, attributes, class memberships and content models are able to be modified. You may start from a previously saved ODD customization or load one of the pre-defined templates as a starting point."

Figure: ROMA main page: presets

Producing ODD's and schemas with ROMA

[→ CUSTOMIZE ODD](#)

Title The title of this customization.	TEI for Manuscript Description
Identifier The identifier of this customization. This will also be the filename of the ODD and schemata on export.	tei_ms
Customization Namespace This is the default XML namespace for new elements you create.	http://www.example.org/ns/tei_ms
<input type="checkbox"/> Apply to new attributes as well.	
Prefix The prefix for pattern names in the schema.	tei_
Language of elements and attributes When element and attributes support multiple languages, choose this one.	English ▾
Documentation Language Documentation will be shown and generated in this language.	English ▾
Author Who created this customization.	Matthias Gille Levenson

Figure: Configuring your ODD

Producing ODD's and schemas with ROMA

The screenshot shows the ROMA application interface. At the top, there are tabs for 'Elements', 'Attribute Classes', 'Model Classes', and 'Datatypes'. On the right side, there are buttons for 'T1 by module', 'filter items', and a search bar. Below these, there is a list of XML elements:

- supplies specification for one parameter of a model behaviour. (tagdocs)
- particDesc (corpus)
(participation description) describes the identifiable speakers, voices, or other participants in any kind of text or other persons named or otherwise referred to in a text, edition, or metadata.
- path (transcr)
(path) defines any line passing through two or more points within a surface element.
- pause (spoken)
(pause) marks a pause either between or within utterances.
- pb (core)
(page beginning) marks the beginning of a new page in a paginated document.

Figure: Find the element you want to modify (here, pb)

Producing ODD's and schemas with ROMA

The screenshot shows the ROMA interface for editing the schema of the <pb> element. At the top, there are tabs for 'Members' and '<pb>' (which is selected). On the right, there is a 'Revert changes' button. The main content area contains the XML definition of the <pb> element, which includes a description: '(page beginning) marks the beginning of a new page in a paginated document.' Below the XML, there are three tabs: 'Documentation' (selected), 'Attributes', and 'Class Membership & Content Model'. The 'Documentation' tab is currently empty.

Figure: Choose the feature you want to adapt (documentation or attribute)

Producing ODD's and schemas with ROMA

The screenshot shows the ROMA interface for editing the `<pb>` element. At the top, there are tabs for "Members", "<pb>", and "Attributes". On the right, there is a "Revert changes" button. The main content area is titled "`<pb>`" and contains the following information:

(page beginning) marks the beginning of a new page in a paginated document.

Element attributes
Edit attributes defined on this element [⊕](#)

Attribute From Classes
Elements can be members of attribute classes to inherit the attributes defined in a class. Here you can:

- Edit class attributes for this element only
- Delete or restore class attributes for this element only
- Change class memberships

[⊕](#)

From att.global

- ~~xml:id~~ [xml:id](#)
(identifier) provides a unique identifier for the element bearing the attribute.
- ~~n~~ [n](#)
(number) gives a number (or other label) for an element, which is not necessarily unique within the document.
- ~~xml:lang~~ [xml:lang](#)
(language) indicates the language of the element content using a tag generated according to BCP 47.
- ~~xml:base~~ [xml:base](#)
provides a base URI reference with which applications can resolve relative URI references into absolute URI references.
- ~~xml:space~~ [xml:space](#)
signals an intention about how white space should be managed by applications.

From att.global.change (Inherited from att.global)

- ~~change~~ [change](#)
points to one or more change elements documenting a state or revision campaign to which the element bearing this attribute and its children have been assigned by the encod...

Figure: Find the attribute you want to modify

Producing ODD's and schemas with ROMA

The screenshot shows the ROMA interface for editing XML schema elements. At the top, there are tabs for 'Members', '<pb>', 'Attributes', and '@n'. On the right, there is a 'Revert changes' button. Below the tabs, a message says '(page beginning) marks the beginning of a new page in a paginated document.' The main area contains several sections:

- Usage**: Set attribute usage. A dropdown menu shows 'Optional'.
- Description**: Contains a brief description of the object documented by its parent element, typically a specification element or an entity. The description text is:

```
1= <desc xmlns="http://www.tei-c.org/ns/1.0" versionDate="2005-10-10" xml:lang="en">gives a number (or other label) for an element, which is not necessarily unique within the document.</desc>
```
- Value description**: Specifies any semantic or syntactic constraint on the value that an attribute may take, additional to the information carried by the datatype element.
- Values**: Set values for this attribute. A dropdown menu shows 'Default (open)'.
- Datatype**: teidata.text

Figure: Change its usage ! It's (almost) automagical !

The produced ODD

```
</encodingDesc>
</teiHeader>
<text>
  <body>
    <p>TEI for manuscript description</p>
    <schemaSpec ident="tei_ms" start="TEI teiCorpus" prefix="tei_" targetLang="en"
      docLang="en">
      <moduleRef key="header"/>
      <moduleRef key="linking"/>
      <moduleRef key="core"/>
      <moduleRef key="tel"/>
      <moduleRef key="textstructure" except="div1 div2 div3 div4 div5 div6 div7"/>
      <moduleRef key="namesdates"/>
      <moduleRef key="transcr"/>
      <moduleRef key="figures"/>
      <moduleRef key="msdescription"/>
      <elementSpec ident="pb" mode="change">
        <attList>
          <attDef ident="n" mode="change" usage="req"/>
        </attList>
      </elementSpec>
    </schemaSpec>
  </body>
</text>
</TEI>
```

I find this specification too broad. I would remove some modules. Do you want to describe figures? Are you interested in named entities?

Producing ODD's and schemas with ROMA: exporting the ODD

- Multiple output formats.
- The most important is ODD for scientific purposes.
- You'll need RNC/RNG for validation purposes.
- You won't be able to retrieve your ODD from an RNG or any other schema file.
- Oxygen can also produce the schema from the ODD's.

Making a reference to the schema in your TEI file

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE TEI SYSTEM "/home/mgl/Bureau/These/Edition/hyperregimiento-de-los-principes/Dedans/XML/schemas/Esc_Q.dtd">
<?xml-model href=".//schemas/out/ODD_edition.rng" type="application/xml" schematypens="http://relaxng.org/ns/structure/1.0"?>
<TEI xmlns="http://www.tei-c.org/ns/1.0" xml:id="Esc_Q" type="transcription">
  <teiHeader>
```

Figure: Before the root node, the reference to a DTD (in blue, second line) and to my ODD derived schema (in violet, third line).

A quick look at our ODD

Let's sum up. You can:

- Completely remove elements (they won't be allowed anymore)
- Partially remove elements (they will be allowed in specific contexts only)
- Constrain attribute types, or attribute values; make some attributes mandatory

How does it work ?

Activate a module and include selected elements

```
<moduleRef key="textcrit" include="listWit witness witEnd witStart app rdg"/>
```

- The `include` attribute means a rebuilding of the module from scratch: absent elements won't be allowed in your encoding
- Note here the choice not to include the `lemma` element, derived from a specific editorial methodology ("variance", etc).

Make attributes mandatory

```
<elementSpec ident="pb" mode="change">
  <attList>
    <attDef ident="n" mode="change" usage="req"/>
  </attList>
</elementSpec>
```

Remove attributes at element level

```
<elementSpec ident="material" mode="change" module="msdescription">
  <attList>
    <attDef ident="function" mode="delete"/>
    <attDef ident="target" mode="delete"/>
    <attDef ident="resp" mode="delete"/>
    <attDef ident="ref" mode="delete"/>
  </attList>
</elementSpec>
```

Constrain attribute values

```
<elementSpec ident="material" mode="change" module="msdescription">
    <attList>
        <attDef ident="type" mode="replace" usage="req">
            <valList mode="add" type="closed">
                <valItem ident="parchment">
                    <desc>The copy medium is parchment.</desc>
                </valItem>
                <valItem ident="paper">
                    <desc>The copy medium is paper.</desc>
                </valItem>
                <valItem ident="mixt">
                    <desc>The copy medium alternates between paper and
                         → parchment.</desc>
                </valItem>
            </valList>
        </attDef>
    </attList>
</elementSpec>
```

The other side of ODD's: natural language documentation

- Roma is just the first step to create the machine-readable version of your ODD
- As said before, you'll need to create and write the documentation *in natural language*, using the TEI. Example: here.
- You can use any XML editor to do so.

```
<p>Enfin, il est important pour une bonne intelligence du texte, d'aller marquer des divisions structurelles et
logiques qui se trouvent au sein des paragraphes. C'est pourquoi je propose d'utiliser des balises vides
<gi> milestone</gi> qui vont marquer, dans un même paragraphe, des énumérations par exemple (méthode moins
lourde qu'en utilisant <gi>list</gi>): <egXML xmlns="http://www.tei-c.org/ns/Examples">E <w lemma="este"
pos="PD0MS000">este</w> es el primero capitulo <w lemma="de+este">desta</w>
<w pos="NCFS000">parte</w> postrimera que <w lemma="estar" pos="VMIP350">esta</w> en tres conclusiones.
<milestone type="structuration_discours" unit="item_rang_1" n="1"/>La primera es que cosa es <w
lemma="caballeria">caualleria</w>. <milestone type="structuration_discours" unit="item_rang_1" n="2"
/>La <w lemma="2" pos="AO0FS0">segunda</w> por que fue fecha e establecida.</egXML></p>
```

Figure: Documenting the use of `milestone` in the edition of the *Regimiento de los principes*.

An example of complete ODD

- An ODD is an XML-TEI document divided in two parts: the documentation and the schema.
- For structuring, use `div1...div9` elements
- You can encode your documentation as you would encode any document
- And put your schema specification (the `schemaSpec`) in a `div1` for instance.

An example of complete ODD

```

<head>Marques de lecture</head>
<p>j'indique les marques de lecture de deux façons distinctes: <list>
  <item>La façon la plus simple est d'utiliser l'élément <gi>hi</gi> avec plusieurs valeurs d'attribut
    <att>rend</att> (Ajouter un exemple ici)</item>
  <item>Pour éviter les cas d'overlapping, en marquant des marques de lecture de différent niveau,
    j'utilise les balises auto-fermantes <gi>anchor</gi>, qui me permettent de marquer le début et la
    fin d'un passage. Ces balises sont typées (<att>type</att>) et contiennent un sous-type permettant
    de distinguer leur style (sous la ligne, en marge), ainsi qu'un attribut (<att>next</att> ou
    <att>previous</att>) pour indiquer si elles indiquent le début ou la fin de la marque de
    lecture.</item>
</list><egXML xmlns="http://www.tei-c.org/ns/Examples">sinon <anchor next="#a2SAcLX9bbVClXI"
  xml:id="a3dutf7XDj8d" type="marque_lecture" subtype="souligne">agua salada, aquella <w lemma="agua"
  pos="NCMS000">agua</w> pueden fazer dulce colándola por la cera, faziendo baçines de cera, et<lb
  break="yes"/><add type="commentaire" place="margin" hand="distincke">agua de
  <unclear>mar</unclear></add>foraçándolos con agujas sotiles de muchos <w lemma="forado">forados</w>
  e espesos.<anchor prev="#a3dutf7XDj8d" xml:id="a2SAcLX9bbVClXI" type="marque_lecture"
  subtype="souligne"/> Ca segunt <w lemma="el" pos="DAOMSO">el</w>
  <w lemma="filósofo" pos="NCMS000">filósofo</w></egXML></p>
</div4>
</div3>
<div3>
  <head>Éléments utilisés dans le cadre de la citation du texte</head>
  <p>La citation de fragments du texte se fait par copie et traitement de noeuds XML entre éléments
    <gi>anchor</gi>. Ces éléments sont de type <val>citation</val>. Des <gi>anchor</gi> de type
    <val>reference</val> sont utilisés pour citer une ligne précise du texte, et des <gi>anchor</gi> de type
    <val>reference</val> sont utilisés pour le texte de façon plus générale. Ces éléments doivent
    impérativement être identifiés par un <att>xml:id</att>.</p>
</div3>
<div3> [5 lines]
</div2>
</div1>
<div1 type="Encodage">
  <head>Manuel d'encodage</head>
  <schemaSpec ident="oddbyexample" start="TEI teiCorpus" targetLang="fr" docLang="fr">
    <moduleRef key="tei"/>
    <!--Checking module textcrit-->
    <classRef key="att.textCritical"/>
    <classRef key="model.rdgLike"/>
    <classRef key="model.rdgPart"/>
    <moduleRef key="textcrit" include="listWit witness witEnd witStart app rdg"/>

```

Figure: Documenting the use of `milestone` in the edition of the *Regimiento de los principes*.

Fine-tune the validation with Schematron

```
<!--The following element can be a child of any elementSpec node-->
<constraintSpec xmlns:sch="http://purl.oclc.org/dsdl/schematron"
  ↵ scheme="isoschematron">
  <constraint>
    <sch:rule context="pb">
      <sch:assert
        test="matches(@n, '\d+[vr]')"
        >Something is wrong with the foliation of this page. Have you
         ↵ forgotten the page side indication ?</sch:assert>
    </sch:rule>
  </constraint>
</constraintSpec>
```

- 1 Introduction
- 2 Schemata
- 3 Conclusions
- 4 Exercise
- 5 One more thing: ODDbyexample

Conclusions

- Schemas even minimal, are essential for any scientific publishing project based on TEI.
- TEI-based editions without the publication of XML sources is quite unuseful and won't last much
- Please provide access to your data (and its documentation) !

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Exercises

- The exercise instructions are in the xml file `bentham.xml`

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ODDbyexample

- ODDByExample is a tool to produce an ODD using an already existing XML-TEI document
- It will create the ODD that matches this document
- Very useful tool ...
- ... that can be tricky if the XML-TEI example shows inconsistency: they will be embedded into your specification
- Make sure to use this tool with small, carefully checked fragments of your document.
- Link: <https://github.com/TEIC/Stylesheets/blob/dev/tools/oddbyexample.xsl>

References

-  Burnard, Lou. "What Is TEI Conformance, and Why Should You Care?" In: *Journal of the Text Encoding Initiative* 12 (2019). ISSN: 2162-5603.
-  Marín Sánchez, Ana María. "La Versión Interpolada de Los Castigos de Sancho IV: Edición y Estudio". PhD thesis. Universidad de Zaragoza, 2003.