Metadata matters: describing a TEI text, its contents, its meanings

Magdalena Turska, James Cummings and many more

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What is Metadata?

- often called "data about data"
- term originally used with electronic data but its meaning has broadened
- data about the content, context, and structure of information resources
- much like an electronic version of a title page attached to a printed work
General purposes of metadata

- supports the identification, retrieval, use, re-use, management, and preservation of information resources
- enriches the informational value of an object
- can describe a collection, a single resource, or a component part of a larger resource
Who is it for?

Librarians  how to identify and describe "electronic books"

Users and text analysts  what are "coding practices" within digital resources
Main purposes of the Librarian vs User

Librarians

- identify the resource in definitive manner
- document its components, media and organization
- declare its legal properties (copyright etc.)

Users and text analysts

- summarize its logical structure
- specify the intended and possible uses
- describe the analytical scheme ("codebook") if it exists
- summarize its properties and content for the use of search engines

This creates lot of tension and pull in separate directions
The Librarian's Header

- Conforms to standard bibliographic model, using similar terminology
- Organized as a single source of information for bibliographic description of a digital resource, with established mappings to other such records (e.g. MARC, EAD, etc.)
- Pressure for greater and more exact constraints to improve precision of description: preference for structured data over loose prose

Librarians want you to adhere to standards and fit into existing databases and search systems. Ooook!
Everyman's Header

Users seek detailed information on possibly every aspect of your source and methodology

- Gives a polite nod to common bibliographic practice, but has a far wider scope
- Supports a (potentially) huge range of very miscellaneous information, organized in fairly ad hoc or individualistic ways
- Many different codes of practice in different user communities
- Unpredictable combinations of narrowly encoded documentation systems and loose prose descriptions

Users seek detailed information on possibly every aspect of your source and methodology
Metadata standards

**DCMI**  Dublin Core Metadata Initiative

**RDF**  Resource Description Framework

**EAD**  Encoded Archival Description

**METS**  Metadata Encoding and Transcription Standard

**OAIS**  Open Archival Information

**OAI-PMH**  Open Archives Initiative-Protocol for Metadata Harvesting

**Z39-50**  ANSI standard protocol (ISO 23950)

TEI provides a richer vocabulary than EAD or DCMI, and is less abstract than RDF or METS
Where the TEI stands

The TEI header was designed with both perspectives in mind.

TEI requires metadata to be stored inside the XML document, prefixed to the content. This information comprises the TEI header although, as we will see, some can be included inside the `<body>`.

TEI header `<teiHeader>` supplies the descriptive and declarative information making up an electronic title page prefixed to every TEI-conformant text.
Types of content in the TEI header

- free prose
  - prose description: series of paragraphs
  - phrase: character data, interspersed with phrase-level elements, but not paragraphs

- grouping elements: specialised elements recording some structured information

- declarations: Elements whose names end with the suffix Decl (e.g. subjectDecl, refsDecl) enclose information about specific encoding practices applied in the electronic text.

- descriptions: Elements whose names end with the suffix Desc (e.g. <settingDesc>, <projectDesc>) contain a prose description, possibly, but not necessarily, organised under some specific headings by suggested sub-elements.
TEI Header Structure

The TEI header has four main components:

- `<fileDesc>` (file description) contains a full bibliographic description of a computer file. N.B. A "computer file" may actually correspond with several files across different operating systems.
- `<encodingDesc>` (encoding description) documents the relationship between an electronic text and the source or sources from which it was derived.
- `<profileDesc>` (text-profile description) provides a detailed description of non-bibliographic aspects of a text, specifically the languages and sublanguages used, the situation in which it was produced, the participants and their setting. (just about everything not covered in the other header elements)
- `<revisionDesc>` (revision description) summarizes the revision history for a file.

Only `<fileDesc>` is required; the others are optional.
General `<teiHeader>` structure

```xml
<teiHeader>
  <fileDesc>
    <titleStmt>
      <!-- title information here --> </titleStmt>
    <editionStmt>
      <!-- edition information here --> </editionStmt>
    <publicationStmt>
      <!-- publication information here --> </publicationStmt>
    <seriesStmt>
      <!-- series related information here --> </seriesStmt>
    <notesStmt>
      <!-- any related notes here --> </notesStmt>
    <sourceDesc>
      <!-- source description here --> </sourceDesc>
  </fileDesc>
  <encodingDesc>
    <!-- encoding description here --> </encodingDesc>
  <profileDesc>
    <!-- profile description here --> </profileDesc>
  <revisionDesc>
    <!-- revision description here --> </revisionDesc>
</teiHeader>
```
Example Header: Minimal required header

<teiHeader>
  <fileDesc>
    <titleStmt>
      <title>A title?</title>
    </titleStmt>
    <publicationStmt>
      <p>Who published?</p>
    </publicationStmt>
    <sourceDesc>
      <p>Where from?</p>
    </sourceDesc>
  </fileDesc>
</teiHeader>
Example Source

Bodleian Library, University of Oxford: John Johnson Collection: Cinemas 1 (43a)
'Through Romantic India' [a machine-readable transcription]
The TEI supports two ‘levels’ or types of header:

- **corpus level** metadata sets default properties for everything in a corpus.
- **text level** metadata sets specific properties for one component text of a corpus.
Corpus Header Example

<teiCorpus xmlns="http://www.tei-c.org/ns/1.0">
<!-- Add xmlns and version in <teiCorpus> -->
   <teiHeader type="corpus">
<!-- corpus-level metadata here -->
<!-- Must contain one TEI header for the corpus. -->
   </teiHeader>
   <TEI>
      <teiHeader type="text">
<!-- metadata specific to this text here -->
<!-- Must contain a series of TEI elements, one for each text. -->
      </teiHeader>
      <text>
<!-- ... -->
      </text>
   </TEI>
   <TEI>
      <teiHeader type="text">
<!-- metadata specific to this text here -->
      </teiHeader>
      <text>
<!-- ... -->
      </text>
   </TEI>
</teiCorpus>
File Description <fileDesc>

- has some **mandatory** elements:
  - `<titleStmt>`: provides a title for the resource and any associated statements of responsibility
  - `<sourceDesc>`: documents the sources from which the encoded text derives (if any)
  - `<publicationStmt>`: documents how the encoded text is published or distributed

- and some **optional** ones:
  - `<editionStmt>`: yes, digital texts have editions too
  - `<seriesStmt>`: and they also fit into "series".
  - `<extent>`: how many floppy disks, gigabytes, files?
  - `<notesStmt>`: notes of various types
File Description <fileDesc> (cont.)

- `<titleStmt>`: contains a mandatory `<title>` which identifies the electronic file (not its source!)
- optionally followed by additional titles, and by "statements of responsibility", as appropriate, using `<author>`, `<editor>`, `<sponsor>`, `<funder>`, `<principal>` or the generic `<respStmt>`
- `<publicationStmt>`: may contain
  - plain text (e.g. to say the text is unpublished)
  - one or more `<publisher>`, `<distributor>`, `<authority>`, each followed by `<pubPlace>`, `<address>`, `<availability>`, `<idno>`
Title and Responsibility Statements
Within `<titleStmt>`, you can repeat any of these elements as necessary, and document additional responsibilities with a generic `<respStmt>`:

```
<titleStmt>
  <title>Letter to Leslie Gunston</title>
  <author>Wilfred Owen</author>
  <editor>Renée van Baalen</editor>
  <principal>James Cummings</principal>
  <meeting>Digital Humanities at Oxford Summer School</meeting>
  <respStmt>
    <resp>Improved encoding</resp>
    <name>James Cummings</name>
  </respStmt>
</titleStmt>
```

- N.B. The title of the electronic work should be derived from the source text, but clearly distinguishable from it.
- At a minimum, identify the author of the text and (where appropriate) the creator of the file or corpus.
Edition and Extent statements...

<editionStmt>

- can be used to document the details of this particular edition (e.g. date)
- optional for the first release, but is mandatory for each later release

<extent>

- approximate size of a text stored on some carrier medium or of some other object, digital or non-digital
- is sometimes used to document number of words in a corpus

<editionStmt>
</editionStmt>
<extent>6.5 kb</extent>
General <teiHeader> structure

<teiHeader>
  <fileDesc>
    <titleStmt>
      <!-- title information here --> </titleStmt>
    <editionStmt>
      <!-- edition information here --> </editionStmt>
    <publicationStmt>
      <!-- publication information here --> </publicationStmt>
    <seriesStmt>
      <!-- series related information here --> </seriesStmt>
    <notesStmt>
      <!-- any related notes here --> </notesStmt>
    <sourceDesc>
      <!-- source description here --> </sourceDesc>
  </fileDesc>
  <encodingDesc>
    <!-- encoding description here --> </encodingDesc>
  <profileDesc>
    <!-- profile description here --> </profileDesc>
  <revisionDesc>
    <!-- revision description here --> </revisionDesc>
</teiHeader>
<publicationStmt>
  <publisher>TEI @ Oxford</publisher>
  <distributor>Digital Humanities at Oxford Summer School</distributor>
  <authority>James Cummings</authority>
  <pubPlace>
    <address>
      <orgName>IT Services</orgName>
      <street>13 Banbury Road</street>
      <settlement>Oxford</settlement>
      <postCode>OX2 6NN</postCode>
      <country>United Kingdom</country>
    </address>
  </pubPlace>
  <date when="2013-07-09">09 July 2013</date>
  <idno>dhoxss-tei-talk03</idno>
  <availability>
    <licence>Licensed with a <ref target="http://creativecommons.org/licenses/by/3.0/">Creative Commons Attribution</ref> licence.</licence>
  </availability>
</publicationStmt>
<publicationStmt> notes

- mandatory element
- <publisher>, <distributor> and/or <authority> must be present unless the entire publication statement is given as prose
- If the creation date is different than the date of publication, creation date should be given within <profileDesc>, not in the <publicationStmt>
- formal license may be entered in <licence> included in <availability>
General <teiHeader> structure

<teiHeader>
  <fileDesc>
    <titleStmt>
      <!-- title information here --> </titleStmt>
    <editionStmt>
      <!-- edition information here --> </editionStmt>
    <publicationStmt>
      <!-- publication information here --> </publicationStmt>
    <seriesStmt>
      <!-- series related information here --> </seriesStmt>
    <notesStmt>
      <!-- any related notes here --> </notesStmt>
    <sourceDesc>
      <!-- source description here --> </sourceDesc>
    </fileDesc>
    <encodingDesc>
      <!-- encoding description here --> </encodingDesc>
    <profileDesc>
      <!-- profile description here --> </profileDesc>
    <revisionDesc>
      <!-- revision description here --> </revisionDesc>
  </fileDesc>
</teiHeader>
Series statement

These include

- separate items that share a collective title applicable to the group
- two or more volumes of items, similar in character and issued in sequence
- separately numbered sequence of volumes within a serial or serials
<seriesStmt>
  <title level="s">Machine-Readable Texts for the Study of Indian Literature</title>
  <respStmt>
    <resp>ed. by</resp>
    <name>Jan Gonda</name>
  </respStmt>
  <biblScope unit="vol">1.2</biblScope>
  <idno type="ISSN">0 345 6789</idno>
</seriesStmt>
General `<teiHeader>` structure

```xml
<teiHeader>
  <fileDesc>
    <titleStmt>
      <!-- title information here --> </titleStmt>
    <editionStmt>
      <!-- edition information here --> </editionStmt>
    <publicationStmt>
      <!-- publication information here --> </publicationStmt>
    <seriesStmt>
      <!-- series related information here --> </seriesStmt>
    <notesStmt>
      <!-- any related notes here --> </notesStmt>
    <sourceDesc>
      <!-- source description here --> </sourceDesc>
  </fileDesc>
  <encodingDesc>
    <!-- encoding description here --> </encodingDesc>
  <profileDesc>
    <!-- profile description here --> </profileDesc>
  <revisionDesc>
    <!-- revision description here --> </revisionDesc>
</teiHeader>
```
The optional `<notesStmt>` can contain notes on almost any aspect of the file or its contents:

```
<notesStmt>
  <note>Transcribed for a TEI Workshop</note>
</notesStmt>
```

These notes can be short statements, or many paragraphs long. Take care to encode such information with more precise elements elsewhere in the TEI header, when such elements are available. For example, text types, such as reportage or detective stories, should be described under `<profileDesc>`
General <teiHeader> structure

<teiHeader>
  <fileDesc>
    <titleStmt>
      <!-- title information here --> </titleStmt>
    <editionStmt>
      <!-- edition information here --> </editionStmt>
    <publicationStmt>
      <!-- publication information here --> </publicationStmt>
    <seriesStmt>
      <!-- series related information here --> </seriesStmt>
    <notesStmt>
      <!-- any related notes here --> </notesStmt>
    <sourceDesc>
      <!-- source description here --> </sourceDesc>
  </fileDesc>
  <encodingDesc>
    <!-- encoding description here --> </encodingDesc>
  <profileDesc>
    <!-- profile description here --> </profileDesc>
  <revisionDesc>
    <!-- revision description here --> </revisionDesc>
</teiHeader>
The Source Description statement
All electronic works need to document their source, even 'born digital' ones! There are variety of elements you may draw from:

- prose description, just a `<p>`
- `<bibl>` (bibliographic citation): contains free text and/or any mixture of bibliographic elements such as `<author>`, `<publisher>` etc.
- `<biblStruct>` (structured) contains similar elements but constrained in various ways according to bibliographic standards
- `<biblFull>` (fully-structured) special-cases texts which were born TEI by replicating an embedded `<fileDesc>`
- A `<listBibl>` may be used for lists of such descriptions, e.g. bibliographies
- Specialised elements for spoken texts (`<recordingStmt>` etc.) and for manuscripts (`<msDesc>`) Discussed later!
Dear L.,

Thanks for your letter morning. I hope you had a good time last Monday.

On Monday next I attend the "Fried Club" a Nat. Hist. assoc. in the town. I am a member of the Geological, Botanical, and a few other bodies. Do you remember the old Black Mott? Well, the days have come when I am a member of a real learned society. My subject is how to raise the annual flower Titus. "Do Plants Think?"

Stimuli chart. Devices for fertilisation, etc. I have no results yet, but I remember a number of useful points from your old books. I think it was "Canals" (I think it was "Canals") studied a 1911. Meanwhile...
Description of the sources

Most digitized texts have not been created in digital form ... it is necessary to describe their sources

TEI provides a wide range of bibliographic elements both structured or not:

- `<bibl>`, `<biblStruct>`
- (for a text already computerized) : `<biblFull>` (same content as `<fileDesc>`)  
- `<listBibl>` a list of items above
- prose description
- and more specialized items for transcripts of speech or manuscripts.
<sourceDesc>
  <biblStruct xml:lang="fr">
    <monogr>
      <author>Henryk Sienkiewicz</author>
      <title>Quo Vadis</title>
      <title type="sub">Powieść z czasów Neron</title>
    </monogr>
    <imprint>
      <pubPlace>Warszawa</pubPlace>
      <publisher>Gebethner i Wolff</publisher>
      <date>1896</date>
    </imprint>
  </biblStruct>
</sourceDesc>
<bibl type="book" subtype="monograph"
  xml:id="brief_discours_1614">
  <title level="m">Brief Discours pour la reformation des mariages</title>
  <pubPlace>Paris</pubPlace>, de l'imprimerie d'<publisher>Anthoine du Brueil</publisher>, rue Saint-Jacques, au dessus de Saint-Benoist, à la Couronne,
  <date when="1614">1614</date>, <biblScope type="pp">pp 3-16</biblScope> dans <title level="m">Variétés Historiques et Littéraires. Recueil de pièces volantes rares et curieuses en prose et en vers</title>, Revues et annotés par M.
  <editor>
    <name>
      <forename>Édouard</forename>
      <surname>Fournier</surname>
    </name>
  </editor>, <biblScope type="vol">Tome IV</biblScope>. A <pubPlace>Paris</pubPlace>, Chez <publisher>P. Jannet</publisher>.
  <date when="1856">MDCCCLVI</date>.
</bibl>
<sourceDesc>
  <recordingStmt>
    <recording type="audio" dur="P30M">
      <respStmt>
        <resp>Location recording by</resp>
        <name>Sound Services Ltd.</name>
      </respStmt>
      <equipment>
        <p>Multiple close microphones mixed down to stereo Digital Audio Tape, standard play, 44.1 KHz sampling frequency</p>
      </equipment>
      <date>12 Jan 1987</date>
    </recording>
  </recordingStmt>
</sourceDesc>

<sourceDesc>
  <recordingStmt>
    <recording type="video" when="1989-06-24" dur="P60M">
      <p><title>24 Heures</title>: émission télévisée <date>24 juin 1989</date></p>
    </recording>
  </recordingStmt>
</sourceDesc>
Born digital source

Aucune source: ce document est né numérique
Fair copy of the letter of Ioannes Dantiscus to Jan Balinski

One page of paper in good condition

Ioannes Dantiscus
Association between header and text

By default everything asserted by a header is true of the text to which it is prefixed. This can be over-ridden:

- as when a text header over-rides or amplifies a corpus-header setting
- when model.declarable elements are selected by means of the @decls attribute (available on all model.declaring elements)
- using special purpose selection/definition elements e.g. `<catRef>` and `<taxonomy>`

Most components of the encoding description are declarable.
General <teiHeader> structure

<teiHeader>
  <fileDesc>
    <titleStmt>
      <!-- title information here --> </titleStmt>
    <editionStmt>
      <!-- edition information here --> </editionStmt>
    <publicationStmt>
      <!-- publication information here --> </publicationStmt>
    <seriesStmt>
      <!-- series related information here --> </seriesStmt>
    <notesStmt>
      <!-- any related notes here --> </notesStmt>
    <sourceDesc>
      <!-- source description here --> </sourceDesc>
  </fileDesc>
  <encodingDesc>
    <!-- encoding description here --> </encodingDesc>
  <profileDesc>
    <!-- profile description here --> </profileDesc>
  <revisionDesc>
    <!-- revision description here --> </revisionDesc>
</teiHeader>
Encoding Description

<encodingDesc> groups notes about the procedures used when the text was encoded, either summarised in prose or within specific elements such as

- <projectDesc>: goals of the project
- <samplingDecl>: sampling principles
- <editorialDecl>: editorial principals, e.g. <correction>, <normalization>, <quotation>, <hyphenation>, <segmentation>, <interpretation>
- <classDecl>: classification system/s used
- <tagsDecl>: specifics about usage of particular elements

Detailed notes in <encodingDesc> could be used to generate section of an editorial description.
The TEI@Oxford project created teaching materials for DHOXSS.

Apparent errors have been marked as *sic* but corrected readings not provided.

Hyphens have been transcribed as they appear.
Example (2)

```xml
<encodingDesc>
  <classDecl>
    <taxonomy xml:id="part-of-speech">
      <category xml:id="adje">
        <catDesc>adjectives</catDesc>
      </category>
      <category xml:id="AJ0">
        <catDesc>adjective (unmarked) (e.g. GOOD, OLD)</catDesc>
      </category>
      <category xml:id="AJC">
        <catDesc>comparative adjective (e.g. BETTER, OLDER)</catDesc>
      </category>
      <category xml:id="AJS">
        <catDesc>superlative adjective (e.g. BEST, OLDEST)</catDesc>
      </category>
      <category xml:id="ATO">
        <catDesc>article (e.g. THE, A, AN)</catDesc>
      </category>
    </taxonomy>
  </classDecl>
</encodingDesc>

<w ana="#AJ0">brilliant</w>
```
The tagging declaration

Records elements namespace, tag frequency, information about the usage of particular tags not specified elsewhere, and default text appearance in source.
Rendition

- `<rendition>`: structured information about appearance in the source document
- rendered using informal prose description, standard stylesheet language (CSS, XSL-FO), or project-defined language.
<rendition> element

which you can easily point to from the text:

<hi rendition="#r-center #r-large">this bit of text was large and centred</hi>

but compare:

<hi rend="large center">this bit of text was large and centred</hi>
<appInfo> element

<appInfo>: structured information about an application which has edited this TEI file

```xml
<appInfo>
  <application version="1.8.2.2"
    ident="ImageMarkupTool" notAfter="2012-06-01">
    <label>Image Markup Tool</label>
    <ptr target="#P1"/>
    <ptr target="#P2"/>
  </application>
</appInfo>
```
General `<teiHeader>` structure

```
<teiHeader>
  <fileDesc>
    <titleStmt>
    <!-- title information here -->  </titleStmt>
    <editionStmt>
    <!-- edition information here -->  </editionStmt>
    <publicationStmt>
    <!-- publication information here -->  </publicationStmt>
    <seriesStmt>
    <!-- series related information here -->  </seriesStmt>
    <notesStmt>
    <!-- any related notes here -->  </notesStmt>
    <sourceDesc>
    <!-- source description here -->  </sourceDesc>
  </fileDesc>
  <encodingDesc>
  <!-- encoding description here -->  </encodingDesc>
  <profileDesc>
  <!-- profile description here -->  </profileDesc>
  <revisionDesc>
  <!-- revision description here -->  </revisionDesc>
</teiHeader>
```
Profile Description

A collection of descriptions, categorised only as "non-bibliographic". Default members of the model.profileDescPart class include:

- `<creation>`: information about the origination of the intellectual content of the text, e.g. time and place
- `<langUsage>`: information about languages, registers, writing systems etc used in the text
- `<textDesc>` and `<textClass>`: classifications applied to the text by means of a list of specified criteria or by means of a collection of pointers, respectively
- `<particDesc>` and `<settingDesc>`: information about the participants, either real or depicted, in the text
- `<handNotes>`: information about the particular style or hand distinguished within a manuscript
Here <listChange> records stages in changes to the document. Further down, in <revisionDesc> the same element is used to record changes to the electronic file.
The `<langUsage>` element is provided to document usage of languages and writing systems in the text. Languages are identified by their ISO codes:

```xml
<langUsage>
  <language ident="en">English</language>
  <language ident="fr">French</language>
  <language ident="bg-cy">Bulgarian in Cyrillic characters</language>
  <language ident="bg">Romanized Bulgarian</language>
</langUsage>
```
Classification Methods

<textClass> groups information which describes the nature or topic of a text in terms of a standard classification scheme, thesaurus, etc. using one or more of the following ways:

using <catRef> direct reference to a locally defined (e.g. in the corpus header) category

using <classCode> reference to some standard and externally defined classification scheme

using <keywords> assign arbitrary descriptive terms taken from a bibliographic controlled vocabulary or a tag cloud
BNC Example

This categorization applies to the whole text. For more fine grained classification, use @decls on e.g. a <div> element to point to applicable variation in header.
Detailed characterization of a text

<textDesc> provides a description of a text in terms of its Situational parameters, a description of the situation within which the text was produced or experienced.

```xml
<textDesc n="novel">
  <channel mode="w">print; part issues</channel>
  <constitution type="single"/>
  <derivation type="original"/>
  <domain type="art"/>
  <factuality type="fiction"/>
  <interaction type="none"/>
  <preparedness type="prepared"/>
  <purpose type="entertain" degree="high"/>
  <purpose type="inform" degree="medium"/>
</textDesc>
```

These subelements constitute the class model.textDescPart: you could modify that for other parameters.
<particDesc xml:id="p2">
</particDesc>

<particDesc> can just contain paragraphs of prose, or a more structured <person> element in <listPerson>
<particDesc> example (2)

<particDesc>
  <listPerson>
    <person xml:id="SL">
      <persName>Stuart Lee</persName>
      <note>
        <ref target="http://users.ox.ac.uk/~stuart/Site/About_Me.html">Stuart Lee's home page</ref>
      </note>
    </person>
    <person xml:id="SR">
      <persName>Sebastian Rahtz</persName>
      <note>
        <ref target="http://uk.linkedin.com/pub/sebastian-rahtz/a/937/208">Sebastian Rahtz's entry in LinkedIn</ref>
      </note>
    </person>
  </listPerson>
</particDesc>
General `<teiHeader>` structure

```xml
<teiHeader>
  <fileDesc>
    <titleStmt/>
    <!-- title information here --> </titleStmt>
    <editionStmt/>
    <!-- edition information here --> </editionStmt>
    <publicationStmt/>
    <!-- publication information here --> </publicationStmt>
    <seriesStmt/>
    <!-- series related information here --> </seriesStmt>
    <notesStmt/>
    <!-- any related notes here --> </notesStmt>
    <sourceDesc/>
    <!-- source description here --> </sourceDesc>
  </fileDesc>
  <encodingDesc/>
  <!-- encoding description here --> </encodingDesc>
  <profileDesc/>
  <!-- profile description here --> </profileDesc>
  <revisionDesc/>
  <!-- revision description here --> </revisionDesc>
</teiHeader>
```
Revision Description

- A list of `<change>` elements, each with a `@date` and `@who` attributes, indicating significant stages in the evolution of a document. Most recent first.

- Can be grouped into `<listChange>` elements. Used here it is about the electronic file, used in `<creation>` it is about the document.

- Can be maintained manually, or done by means of a version control system (like SVN)

```xml
<revisionDesc>
  <listChange>
    <change when="2012-07-03">
      <persName>James Cummings</persName> improved the header.
    </change>
    <change when="2012-02">
      <persName>Renée van Baalen</persName> transcribed the <title>Letter to Leslie Gunston</title> document.
    </change>
  </listChange>
</revisionDesc>
```
Any Questions? Next, the timetable says we're doing an exercise!

Guidelines for future reference