TEI P5: The Full Story

The TEI infrastructure: classes and extensions — Sebastian Rahtz

TEI Conformance — James Cummings

Persons and places — Arianna Ciula

Facsimile markup — Dot Porter

Editorial intervention — Dan O'Donnell

Conversion from P4 to P5 — Syd Bauman
TEI Technical Council

TEI Members Meeting, November 2007
Outline

1. The TEI infrastructure: classes and extensions — Sebastian Rahtz
2. TEI Conformance — James Cummings
3. Persons and places — Arianna Ciula
4. Facsimile markup — Dot Porter
5. Editorial intervention — Dan O'Donnell
6. Conversion from P4 to P5 — Syd Bauman
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What has the TEI ever done for us?

- 502 well-documented textual distinctions covering many fields in great detail
- a detailed implementation, using standard XML tools
- a modular and extensible architecture
- well-written and comprehensive Guidelines
- an independent, academic, governance
- a good and varied community of practice
TEI Old

- an academic research project — on soft money
- a codification of common practice — but with no formal development mechanism
- a community effort — with no clear licencing rules
- an overly complex and sophisticated system — usable only by the priesthood
- a naive and reductionist view of the complexities of real text — useful only to the amateur
- a software and hardware independent system — that doesn't actually work on anything because there are no tools to do something with a TEI text
TEI New

- Proper open source licence, with visible development on Sourceforge
- Architecture rethought to facilitate expansion and integration with other systems
- Self documenting, each release fully validated, delivered using standard mechanisms
- Publicly available processing tools managed together with the Guidelines
- Active developer community, wiki, etc. Test files, exemplars, regular updates...
- New governance structure, new tools, new modules...
New directions in TEI P5

1. Be a good digital citizen:
   - Support for multiple schema languages and namespaces
   - Reliance on XML, and hence on Unicode
   - Validation of attributes and datatyping
   - Use of W3C pointers and paths

2. Make it flexible:
   - ODD: a single specification language for developers, users, and teachers, integrating schema and documentation;
   - Verifiable conformance

3. Old annoyances removed and some new topics added
New Topics Treated

P5 includes significant new material:

1. manuscript description
2. manuscript transcription
3. data about persons and places
4. floating and overlapping texts
5. integration of text and graphics
6. markup documentation
7. internationalization features
The TEI defines over 500 elements. We need some way of grouping them! We put them in classes, which are classified in two different ways:

- **attribute** classes contain elements which share the same attributes
- **model** classes contain elements which appear in the same place in the content models of other elements

Classes may themselves be classified: that is, a class may be defined as a combination of other classes. Subclasses are generally distinguished semantically. Wherever possible, content models reference model classes rather than specific elements.
There are three styles of class name:

- `att.xxxx` elements which share `xxxx` attributes, e.g. `att.linking`
- `model.xxxLike` elements which are semantically like an `xxxx`, e.g. `model.hiLike`
- `model.xxxPart` elements which appear within an `xxxxx`, e.g. `model.biblPart`
Why use classes?

- Classes are easier to understand and remember than elements
- Adding a new element becomes a matter of deciding what it is ‘Like’, or what it is a ‘Part’ of
- Specialization of the TEI generic structure for specific needs becomes a simple declarative matter
- Customizations expressed in terms of class modifications are inherently interoperable
Uniformity of description

- modules, elements, attributes, value-lists are treated uniformly
- each has an identifier, a gloss, a description, and one or more equivalents
- each can be added, changed, replaced, deleted within a given context
- for example, membership in the att.typed class gives you a generic type attribute, which can be over-ridden for specific class members
Overriding a value-list

```xml
<elementSpec ident="list" module="core" mode="change">
  <classes>
    <memberOf key="att.typed"/>
  </classes>
  <attDef ident="type" mode="replace">
    <valList type="closed">
      <valItem ident="ordered">
        <desc>items in the list are sequentially numbered</desc>
      </valItem>
      <valItem ident="unordered">
        <desc>items in the list are unordered</desc>
      </valItem>
    </valList>
  </attDef>
</elementSpec>
```
Adding new elements

Members of the class model.hiLike represent any kind of notable typographic highlighting. We can add new members simply:

```xml
<elementSpec
    ident="fraktur"
    mode="add"
    ns="http://www.example.org/ns/nonTEI">
  <desc>marks a passage using a fraktur-style typeface</desc>
  <classes>
    <memberOf key="model.hiLike"/>
  </classes>
</elementSpec>
```

If you do this, however, you meet issues of conformance — see later!
The Conformance chapter is now not a chapter by itself, but a section of Chapter 23, "Using the TEI". It also has sections on:

- Obtaining the TEI Schemas
- Personalization and Customization
- Implementation of an ODD System

The notion of TEI Conformance is meant to assist in situations such as:

- interchange of documents between users
- software specifications for TEI-aware processing tools
- archival deposit and distribution of TEI texts
- specifying the form of project documents

It is not an evaluation of scholarly merit or value for money. A document may be of major intellectual importance and yet not be TEI Conformant; a TEI Conformant document may also be of no scholarly value.
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- is a well-formed XML document
- can be validated against a TEI Schema, that is, a schema derived from the TEI Guidelines
- conforms to the TEI Abstract Model
- uses the TEI Namespace correctly
- is documented by means of a **TEI Conformant** ODD file
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TEI Conformable, TEI Extensions, and TEI Recommended Practice

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- **TEI Extension**: valid against a Schema which contains additional distinctions not present in the TEI Abstract Model and unable to be transformed without loss of information. Those parts which are not extensions should be TEI Conformant, or Conformable.

- **TEI Recommended Practice**: A TEI Conformant (or Conformable) document is said to follow TEI Recommended Practice if, wherever the Guidelines prefer one encoding practice to another, the preferred practice is used.
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The TEI Namespace is new to TEI P5:

- Some of the benefits of using namespaces:
  - use of external schemas in their own namespace
  - inclusion of TEI schemas in non-TEI documents
  - preservation of TEI concepts and abstract model

- A TEI Conformant document must
  - declare all namespaces for the elements and attributes it uses
  - use the TEI namespace for elements which represent concepts from the TEI abstract model
  - declare new elements and attributes in a separate namespace
  - not put non-TEI elements or attributes into the TEI namespace

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The TEI Namespace: http://www.tei-c.org/ns/1.0

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The ‘Names, Dates, People, and Places’ chapter has been extended further to allow for:

- Refined encoding of text where there are references to persons and places
- Integration with and creation of data structures (e.g. authority files, bio/prosopographical DB, gazetteers) related to persons and places
- Representation of canonical information about names (onomastics, toponymy)
- Coherent models across diverse data
Extensions

The main extensions concern:

- Modelling of data about places at the intersection between history and geography
- Refined expression of date and time
- Definition for a canonical name or name-part of any kind
- Representation of organizations (businesses or institutions, racial or ethnic groupings or political factions) and organizational names
Place-names and Places

Besides the possibility of encoding name components, new elements have been created for representing data about the places those names can refer to: `<listPlace>` and `<place>.

- Geopolitical inclusion of places can be expressed by nesting and/or by stating explicit relationships: `<relationGrp>` and `<relation>`

- The conceptualization of States, Traits and Events inherited from the section on persons is also applied to places:
  - e.g. of traits: `<population>`, `<climate>`, `<terrain`
  - the new element `<location>` is a kind of trait and is used to represent geographical location and geopolitical structures
  - within `<location>`, `<geo>` can be used to express latitude and longitude (recommended `datum: WGS84`)

- As for persons, responsibility and uncertainty about the sources can be asserted by using the attribute class att.editLike.
Dates and Periods

- Thanks to the mapping to W3C (att.datable.w3c) and ISO date formats, automatic processing and validation of expression of dates and times are now allowed.
- Time periods and relative chronology can also be defined.
Nyms

- The elements `<listNym>` and `<nym>` have been introduced to define canonical name or name-part of any kind.
- `<nym>`
  - can contain model.entryParts (e.g. `<form>`, `<orth>`, `<etym>`) and may also include a number of other `<nym>`s
  - in addition to global attributes and att.typed, it includes the attribute `@parts` to point to constituent `<nym>`s
- `@nymRef` has been added to the attribute class att.naming to refer to the canonical name.
Place example

```xml
<listPlace>
  <place xml:id="collegepark" type="city">
    <placeName nymRef="#college #park">College Park</placeName>
    <location>
      <geo>38.996560 -76.927509</geo>
    </location>
    <location type="geopolitical">
      <region type="county">Prince George's County</region>
      <region type="state">Maryland</region>
      <country>USA</country>
    </location>
    <population resp="#censusGR2" when="2000">
      <ab>
        <num>24,657</num>
      </ab>
    </population>
    <trait type="timezone">
      <ab>EST (UTC-5)</ab>
    </trait>
  </place>
</listPlace>
```
<place xml:id="umd">
  <placeName>University of <placeName nymRef="#maryland">Maryland</placeName>
  </placeName>
  <placeName>UM</placeName>
  <placeName>UMD</placeName>
  <placeName>UMCP</placeName>
  <event type="foundation" when="1856">
    <desc>
      <persName ref="#calvertCB">Charles Benedict Calvert</persName> founded it as the first agricultural research college in America (later the Maryland Agricultural College at College Park), chartered in 1856.
    </desc>
  </event>
</place>
Person example

```xml
<listPerson>
  <!-- [...] -->
  <person xml:id="calvertCB">
    <persName>
      <forename>Charles Benedict</forename>
      <surname>Calvert</surname>
    </persName>
    <birth when="1808-08-23">b. 23 Aug 1808</birth>
    <death when="1906-08-31">d. 31 Aug 1906</death>
    <event type="marriage" when="1866-06-14">
      <desc>Married 14 June 1866 to Eleanor Makubin.</desc>
    </event>
    <event type="donation">
      <desc>He was a prominent agriculturalist and donated land for an agricultural college which later became the University of Maryland.</desc>
    </event>
  </person>
  <relation name="spouse" mutual="#calvertCB #makubinE"/>
  <!-- [...] -->
</listPerson>
```
Facsimile markup — Dot Porter

- `<facsimile>`: representation of some written source in the form of a set of images rather than as transcribed or encoded text.
- `<surface>`: a rectangular written surface, optionally grouping one or more graphic representations of that space
  - `@start`: pointer to element which encodes the starting position of the text corresponding to the inscribed part of the surface.
- `<zone>`: a rectangular area contained within a `<surface>` element.
- `att.global.facs`: elements which can be associated with an image or a surface within a facsimile element.
  - `@facs (facsimile)` points directly to an image, or to a part of a facsimile element which corresponds with this element.
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- `att.global.facs`: elements which can be associated with an image or a surface within a facsimile element.
  - `<facs>` (facsimile) points directly to an image, or to a part of a facsimile element which corresponds with this element.
Simplest case: using @facs for 1:1 mapping

If a digital text contains one image per page or column (or similar unit), and no more complex mapping between text and image is envisaged, then the @facs attribute may be used to point directly to a graphic resource.

```xml
<TEI>
  <teiHeader>
    <!--...
    </teiHeader>
    <text>
      <pb facs="LSH-416.pdf" n="416"/>
      <head>THE LEGEND OF SLEEPY HOLLOW</head>
      <!-- Page 416 continues -->
      <pb facs="LSH-417.pdf" n="417"/>
      <lb n="1"/>of the quietest places in the whole world.
      A small brook
      <!-- Page 417 continues -->
    </text>
  </TEI>
```
Using these attributes and elements together enables an editor to

- associate multiple images with each page
- record arbitrary planar coordinates of textual elements on any kind of written surface and link such elements to digital facsimile images of them
Using `@facs` in conjunction with `<facsimile>`, `<surface>`, and `<zone>`

Using these attributes and elements together enables an editor to

- associate multiple images with each page
- record arbitrary planar coordinates of textual elements on any kind of written surface and link such elements to digital facsimile images of them
<facsimile>

<facsimile> represents a digital facsimile. It appears within a TEI document along with, or instead of, the <text> element. Valid combinations:

- a TEI Header and a text element
- a TEI Header and a facsimile element
- a TEI Header, a facsimile element, and a text element

```xml
<TEI>
  <teiHeader>
    <!--...-->
  </teiHeader>
  <facsimile>
    <graphic url="LSH-416.pdf"/>
    <graphic url="LSH-417.pdf"/>
    <graphic url="LSH-418.pdf"/>
    <graphic url="LSH-419.pdf"/>
  </facsimile>
  <text>
    <!-- ...-->
  </text>
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  <graphic url="LSH-417.pdf"/>
  <graphic url="LSH-418.pdf"/>
  <graphic url="LSH-419.pdf"/>
</facsimile>

<text>
  <!-- ...-->
</text>
</TEI>
```
The `<surface>` element may be used to indicate that there are two image files corresponding with the same area of the work:

```xml
<facsimile>
  <surface>
    <graphic url="LSH-416.pdf"/>
    <graphic url="psnyp1_berg_979.jpg"/>
  </surface>
  <graphic url="LSH-416.pdf"/>
  <graphic url="LSH-416.pdf"/>
</facsimile>
```
The actual dimensions of the object represented are not documented by the surface element; instead, the surface is located within an abstract coordinate space, which is defined by the following attributes, supplied by the att.coordinated class:

- **@ulx** gives the x coordinate value for the upper left corner of a rectangular space.
- **@uly** gives the y coordinate value for the upper left corner of a rectangular space.
- **@lrx** gives the x coordinate value for the lower right corner of a rectangular space.
- **@lry** gives the y coordinate value for the lower right corner of a rectangular space.
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- **@lry** gives the y coordinate value for the lower right corner of a rectangular space.
Example
Encoding of example

```xml
<facsimile>
  <surface ulx="0" uly="0" lrx="993" lry="1639">
    <graphic url="psnyp1_berg_979-text.jpg"/>
  </surface>
</facsimile>
```
We can also define zones of interest, representing areas smaller (or larger) than this surface.

```xml
<facsimile>
  <surface ulx="0" uly="0" lrx="993" lry="1639">
    <graphic url="psnyp7_berg_979.jpg"/>
    <zone ulx="93" uly="681" lrx="967" lry="1568"/>
  </surface>
</facsimile>
```
The `<desc>` element may also be used within either `<surface>` or `<zone>` to provide some further information about the area being defined. In this case, each surface must specify a bounding box which encloses the appropriate page, as well as defining the zone for the graphic itself:

```xml
<facsimile>
  <surface ulx="0" uly="0" lrx="993" lry="1639">
    <zone ulx="96" uly="89" lrx="950" lry="657">
      <desc>front matter</desc>
    </zone>
  </surface>
  <surface ulx="0" uly="0" lrx="993" lry="1639">
    <zone ulx="93" uly="681" lrx="967" lry="1568">
      <desc>main text</desc>
    </zone>
  </surface>
</facsimile>
```
More uses for `<zone>`

`<zone>` elements may also be used to select parts of each surface for analytical purposes.

```xml
<facsimile>
  <surface ulx="0" uly="0" lrx="993" lry="1639">
    <graphic url="psnyp1_berg_979.jpg/>
    <zone ulx="93" uly="681" lrx="967" lry="1568">
      <desc>main text</desc>
    </zone>
  </surface>
  <zone ulx="507" uly="1109" lrx="707" lry="1163">
    <desc>supralinear addition</desc>
  </zone>
</facsimile>
```
Aligning the transcription with facsimile elements

1. give each relevant part of the facsimile an identifier
2. using the @facs attribute, point from the transcription into the <facsimile>
IN the bosom of one of those

<!-- continues -->
Using \texttt{@start} to link from \texttt{<facsimile>} to transcription

It is also possible to point in the other direction, from a \texttt{<surface>} or \texttt{<zone>} to the corresponding text. This is the function of the \texttt{@start} attribute, which supplies the identifier of the element containing the transcribed text found within the \texttt{<surface>} or \texttt{<zone>} concerned.
<facsimile>
  <surface ulx="96" uly="89" lrx="950" lry="657" start="#SH-front">
    <!-- ... -->
  </surface>
  <surface ulx="93" uly="681" lrx="967" lry="1568" start="#SH-pg1">
    <!-- ... -->
  </surface>
</facsimile>
<text>
  <front xml:id="sh-front">
    <!-- ... -->
  </front>
  <body>
    <div>
      <p>
        <pb n="1" xml:id="SH-pg1ab"/>IN the bosom of one
        of
      </p>
    </div>
    <!-- continues -->
  </body>
Live Example

```xml
<facsimile>
  <surface xml:id="grave" ulx="0" uly="0" lrx="355" lry="678">
    <graphic url="gravestone-cropped.jpg"/>
    <zone ulx="83" uly="223" lrx="272" lry="256" xml:id="line1"/>
    <zone ulx="92" uly="251" lrx="256" lry="282" xml:id="line2"/>
    <zone ulx="21" uly="281" lrx="330" lry="308" xml:id="line3"/>
    <zone ulx="36" uly="306" lrx="320" lry="332" xml:id="line4"/>
    <zone ulx="85" uly="535" lrx="249" lry="556" xml:id="line5"/>
    <zone ulx="97" uly="556" lrx="241" lry="576" xml:id="line6"/>
    <zone ulx="58" uly="577" lrx="281" lry="595" xml:id="line7"/>
    <zone ulx="68" uly="595" lrx="271" lry="613" xml:id="line8"/>
  </surface>
</facsimile>
```
<text>
<body>
  <div facs="#grave">
    <p>Private Moulds' gravestone</p>
  </div>
  <div>
    <ab>
      <s facs="#line1">12851 PRIVATE</s>
      <lb/>
      <s facs="#line2">H. MOULDS</s>
      <lb/>
      <s facs="#line3">NORTHAMPTONSHIRE REGT.</s>
      <lb/>
      <s facs="#line4">23RD JULY 1916 AGED 21</s>
    </ab>
    <ab>
      <s facs="#line5">LOVING SON OF</s>
      <lb/>
      <s facs="#line6">MRS MOULDS</s>
      <lb/>
      <s facs="#line7">PETERBORO, ENGLAND</s>
      <lb/>
      <s facs="#line8">FOR EVER WITH US</s>
    </ab>
  </div>
</body>
</text>
See it live

http://users.ox.ac.uk/~rahtz/test4.html
The elements used for recording editorial intervention is in many ways very familiar (at least superficially): it employs many of the same elements, and adds elements that address nuances that were difficult to represent in older versions of the Guidelines. But it has considerably improved on older versions in the recommended syntax. The new Guidelines:

- remove ambiguities present in the older system
- improve on practice that the older versions encouraged
- provide a powerful model for representing other types of interventions
Many of the elements for recording editorial intervention are (superficially) similar to the old versions of the guidelines:

- Many familiar elements and concepts
- `<abbr>`, `<expan>`, `<add>`, `<del>`, `<app>`
The New

- A number of new elements added to address issues that have come up before in discussions of things the old elements were not able to do well:
  - `<ex>` (editorial expansion) contains a sequence of letters added by an editor or transcriber when expanding an abbreviation.
  - `<am>` (abbreviation marker) contains a sequence of letters or signs present in an abbreviation which are omitted or replaced in the expanded form of the abbreviation.
Where the guidelines differ the most from previous versions in their handling of editorial intervention is in their syntax that is to say they way the old and new elements interact with each other here the change is fairly fundamental, and represents a noticable improvement on the old system
A key change in the new guidelines is the way they handle the old ‘Janus Tags’

- e.g. Previous ways of encoding abbreviations/expansions

```xml
<abbr>can't</abbr>
<expan>cannot</expan>
<abbr expan="cannot">can't</abbr> or

<expan abbr="can't">cannot</expan>
```
Problems:

- the relationship is not explicit
  - `<abbr><hi>þ</hi>t</abbr><expan>þat</expan>`
- the expan or abbr attributes might themselves contain markup.
  - `<abbr expan="þat"><hi>þ</hi>t</abbr><expan abbr="<hi>þ</hi>t">þat</expan>`
- The new solution is to make explicit the connection between the editorial intervention elements

```xml
<choice>
  <abbr>
    <hi>þ</hi>t
  </abbr>
  <expan>þat</expan>
</choice>
```
Going forward:

- The choice element is currently restricted to the use of transcriptional/editorial tags
- But it is a very powerful mechanism
Conversion from P4 to P5 — Syd Bauman

Conversion from P4 to an equivalent encoding in P5:

- likely to be pretty easy
- could be difficult if you have lots of extensions
  - even harder if your extensions are directly to a flat DTD and poorly documented
- requires use of namespaces

**But** ... migration gives you the opportunity to examine your encoding methodology, looking for

- new & better ways to do things
  - may have been available in P4
  - maybe not
- old, useless encoding — purge? encode differently?
What Needs Conversion?

- schemas
- documentation
- document instances
- processes
Schemas

- TEI P4 Lite users could probably switch to TEI P5 Lite
  - but creating your own customization is recommended
- those without extensions could just use the provided tei_all customization
  - but creating your own customization is recommended
- no existing software to convert extensions
  - but creating your own customization is recommended
• project encoding documentation will need to be updated
• doing so in your own customization is recommended
Document Instances

- mostly automated conversion
- straightforward automation will occasionally produce the wrong result

```xml
<pb id="p17" n="page17.jpg"/>
```

- some features more restricted (e.g., language identification): may require human intervention
- character entities — what to do?
Processes

- almost all will require some sort of change or upgrade
- for many processes, changes will be very minor
- all will need to be namespace-aware
Where to Start

http://www.tei-c.org/Guidelines/P5/migrate.xml