Linking and Analysis

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Linking, segmentation and alignment

In some texts we need to be able

- to link disparate elements without using the *@xml:id* attribute;
- to *segment* text into elements and to mark arbitrary points within documents
- to represent correspondence or alignment among groups of text elements
- to synchronize elements of a text, representing temporal correspondences and alignments among text elements
- to specify that one text element is *identical* to or a *copy* of another
- to *aggregate* possibly noncontinguous elements
- to specify that different elements are *alternatives* to one another and to express *preferences* among the alternatives
- to store markup separately from the the data it describes

Underlying assumptions

- Use W3C identifying, pointing and linking mechanisms where possible
- Use *@xml:id* to identify an element directly
- Use XPointer to point to elements that do not have an *@xml:id*

Complex pointing

The standard URI scheme allows for pointing

- to documents other than the current document
- to a particular element in a document other than the current document using its xml:id;

but we also need to point

- to a particular element using its position in the XML element tree (standard XPointer schemes)
- at arbitrary content in any XML document using TEI-defined XPointer schemes

Some W3C XPointer schemes (1)

element Identify elements by position within parent, recursively.

left Locates the point immediately preceding its argument. The argument may return a node, node set, range, or point. (TEI Submitted)

range Locates a range between two points in an XML information set. Takes two pointer arguments which locate the boundaries of the range by two points, and are interpreted as fragment identifiers. (TEI Submitted)

Some W3C XPointer schemes (2)

right Locates the point immediately following its argument. The sole argument is a pointer, which is treated as if it were a fragment identifier itself. (TEI Submitted)

string-range Locates a range based on character positions. Takes three arguments: a pointer, an offset, and a length. (TEI Submitted)

xmlns Bind a prefix for use in subsequent pointer parts e.g. xmlns(xs=http://www.w3.org/2001/XMLSchema)

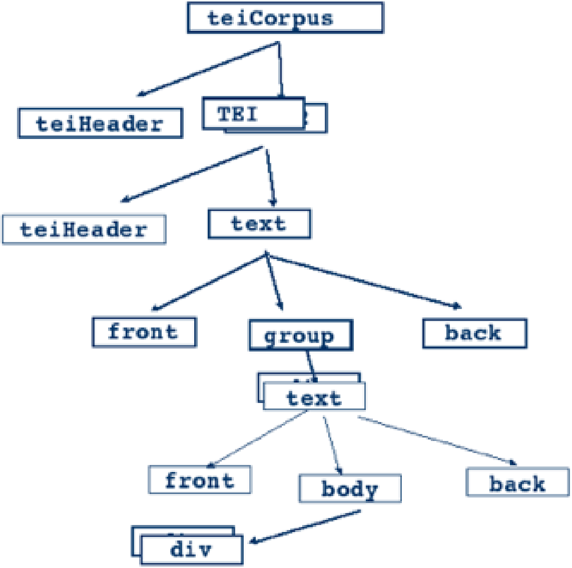
Some W3C XPointer schemes (3)

xpath1 Locates a node or node set within an XML Information Set. The single argument is an XPath path as defined in the W3C XPath 1 Recommendation.

xpath2 Locates a node or node set within an XML Information Set. The single argument is an XPath path as defined in the W3C XPath 2 Recommendation.

xpointer The rich scheme including XPaths and ranges described in the XPointer Recommendation

Test document for XPointer schemes



```
<text>
 <body>
<!-- seven divs here -->
  <div xml:id="lastterm">
   <p>… </p>
   <p>… </p>
   <p>
    <emph>'But'</emph>, said
   <name key="Stalky">Stalky</name>,
        ‘come to think of it, we've done more giddy
        jesting with the Sixth since we've been
        passed over than any one else in the last
        seven years.’</p>
  </div>
 </body>
</text>
```

Examples for XPointer schemes

`element()`:

```
<ptr target="stalky.xml#element(lastterm)"/>
<ptr target="stalky.xml#element(1/1/8)"/>
```

`xpointer()` and `xmlns()`:

```
<ptr
   target="stalky.xml#xmlns(t=http://www.tei-c.org/ns/1.0)
xpointer(/t:TEI/t:text/t:body/t:div[8])"/>
```

`range()`:

```
<ptr
   target="stalky.xml#xmlns(t=http://www.tei-c.org/ns/1.0)
range(xpath1(/t:TEI/t:text/t:body/t:div[8]/t:p[3]),
xpath1(/t:TEI/t:text/t:body/t:div[8]/t:p[5]))"/>
```

```
<ptr
   target="stalky.xml#xmlns(t=http://www.tei-c.org/ns/1.0)
xpointer(/t:TEI/t:text//t:p[t:name[.='Stalky']])"/>
```

Note that the last expression returns multiple nodes

A daily use for XPointer

The W3C XInclude specification is a good way to write composite documents; the `<include>` element's @*href* attribute allows for XPointers:

```
<div>
 <p> <xi:include href="stalky.xml#
   xmlns(t=http://www.tei-c.org/ns/1.0)
   xpointer(/t:TEI/t:text//t:p[t:name[.='Beetle']])"/>
 </p>
</div>
```

Generic linking

The core TEI `<ptr>` and `<ref>` elements let you do the point to point linking we are used to on web pages, relying on XML IDs for internal links:

```
<p>Wikipedia has a a good starter page on
<ref
    target="http://en.wikipedia.org/wiki/Maneki_Neko">waving
cats</ref>, with links to more esoteric
resources; our own pictures are in
section <ref target="#cats">3</ref>
</p>
```

‘linking’ Module

The linking module adds <link> to let you specify a point to point relationship between two or more elements:

```
<p xml:id="beetle1">You're a despondin' brute, Beetle</p>
<p xml:id="beetle2">An' who the dooce is this
Raymond Martin, M.P.?’ demanded Beetle</p>
<link targets="#beetle1 #beetle2"/>
```

Note that this is establishing a connection, not a direction.

Groups of links

<linkGrp> is provided to group together sets of <link>s. In the following example, it allows for stand-off notes, and characterisation of those notes:

```
<l xml:id="l2.79">A place there is, betwixt earth,
air and seas</l>
<l xml:id="l2.80">Where from Ambrosia, Jove
retires for ease.</l>
<l xml:id="l2.88">Sign'd with that Ichor which from Gods
distills.</l>
<note xml:id="n2.79">
 <bibl>Ovid Met. 12.</bibl>
 <quote xml:lang="la">
  <l>Orbe locus media est, inter terrasq; fretumq;</l>
  <l>Cœlestesq; plagas –</l>
 </quote>
</note>
<note xml:id="n2.88">Alludes to <bibl>Homer, Iliad 5</bibl>
</note>
<linkGrp type="imitationnotes">
 <link targets="#n2.79 #l2.79"/>
 <link targets="#n2.88 #l2.88"/>
</linkGrp>
```

Segmenting text, and marking arbitrary points within documents

This module adds three useful new elements:

- `<ab>` marks an block of text with no special semantic interpretation
- `<seg>` marks a range of text with no special semantic interpretation
- `<anchor>` marks an arbitrary point in the text

The first two have helpful @*type* and @*subtype* attributes.

Marking points

<anchor> is comparable to HTML anchors:

```
<p>He was merely working up to a peroration, and the
boys knew it; but McTurk cut through the frothing
sentence, the others echoing:</p>
<p>‘<anchor xml:id="MTa"/>I appeal to the Head, sir.’</p>
<p>‘<anchor xml:id="Ba"/>I appeal to the head, sir.’</p>
<p>‘<anchor xml:id="Sa"/>I appeal to the Head, sir.’</p>
<p>It was their unquestioned right. Drunkenness meant
expulsion after a public flogging. They had been
accused of it. The case was the Head's, and the
Head's alone.</p>
```

Anonymous blocks

In this inscription, there are separate lines, but they are not poetry, or paragraphs, so we isolate them with <ab> (or if we didn't want to encapsulate them we could use `<lb/>`):

```
<div>
 <ab>JOSEPH STORY</ab>
 <ab>ONLY SON OF</ab>
 <ab>WILLILAM W. AND EMELYN STORY</ab>
 <ab>BORN MAY 3rd 1847</ab>
 <ab>AT BOSTON U.S.A</ab>
 <ab>DIED NOV. 23rd 1853</ab>
 <ab>AT ROME</ab>
</div>
```

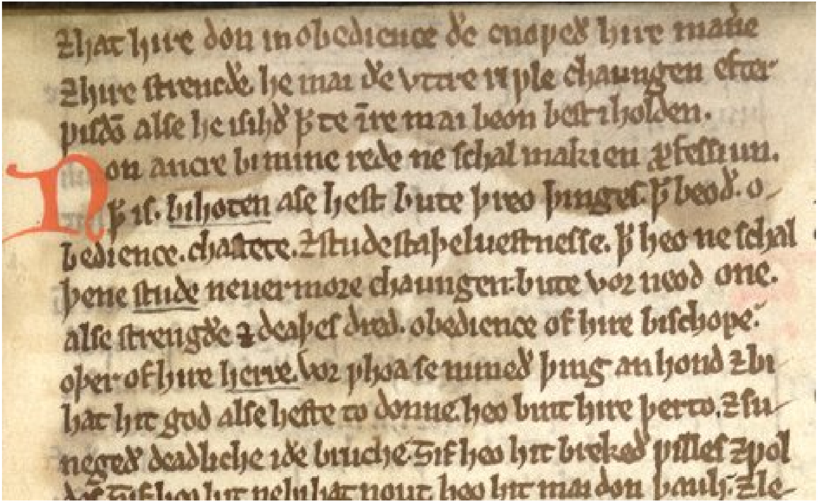
Segments

There are more specific elements elsewhere in the TEI for marking sentences, words and characters, but sometimes we need to mark an arbitrary span, using <seg>:

```
<q>Don't say <q>
   <seg type="stutter">I-I-I</seg>'m afraid,</q>
Melvin, just say <q>I'm afraid.</q>
</q>
```

Correspondence and alignment

First, consider the representation of a manuscript page:



ȝhat hire don inobedience ðe cnopeð hire make
& hire strencðe. he mai ðe vtter riwle changen efter
wisdom alse he isihð þet te inre mai beon best iholden.
Non ancre bi mine rede ne schal makien professiun.
þet is. bihoten ase hest bute þreo þinges. þet beoð. o
bedience. chastete. & studestaþeluestnesse. þet heo ne schal
þene stude neuermore chaungen. bute vor neod one.
alse strengðe & deaþes dred. obedience of hire bischope.
oþer of hire herre. vor hwa se nimeð þing an hond & hit
hat hit god alse heste to donne. heo bint hire þerto. & su
negeð deadliche ide bruche. Ȝif heo hit brekeð willes & wol
de. ȝif heo hit nehhwat nout heo hit mai don [illegible] ele

Manuscript Text

```
<ab xml:id="N6">
 <lb/>and hat hire
don in obedience ðe cnoweð hire manere
<lb/>and hire strencðe. he mai ðe vttre
riwle chaungen efter <lb/>wisdom alse he
isihð te inre mai beon best iholden.
<anchor xml:id="N_6"/>
 <lb/>Non ancre bi
mine rede ne schal makien professiun.
<lb/>þet is. bihoten ase hest.
</ab>
```

Correspondence and alignment (cont.)

Now lets look at an edited version and a translation:

```
<p xml:id="edited_6">Nan ancre bi mi read ne schal
makien professiun—þet is, bihaten
ase heast—bute þreo þinges,
þet beoð obedience, chastete, ant
stude-steaðeluestnesse
<!-- ... -->
</p>
```

```
<p xml:id="translated_6">My advice
is that no anchoress should make
profession—that is, bind herself to
a vow—of more than three things,
which are obedience, chastity, and
stability of abode
<!-- ... -->
</p>
```

Correspondence and alignment (cont.)

We can express a relationship between the texts as follows:

```
<linkGrp type="translations">
 <link targets="#edited_6 #translated_6"/>
<!-- … -->
</linkGrp>
<linkGrp type="editions">
 <link targets="#N-f2r #N6"/>
<!-- … -->
</linkGrp>
```

meaning ‘this paragraph in the translated edition corresponds to text at that anchor in the original’.

There are many other ways of dealing with material like this!

Synchronizing time-based material

If you are linking together sequences which are aligned by time, there is a special stand-off linking element <when>, grouped inside a <timeline>. It has attributes:

absolute an absolute time for the event

interval the length of the gap since the last event

unit the unit of time in which the interval value is expressed

since a link to the previous event

```
<timeline xml:id="tl1" origin="#w0" unit="ms">
 <when xml:id="w0" absolute="11:30:00"/>
 <when xml:id="w1" interval="unknown" since="#w0"/>
 <when xml:id="w2" interval="100" since="#w1"/>
 <when xml:id="w3" interval="200" since="#w2"/>
 <when xml:id="w4" interval="150" since="#w3"/>
</timeline>
```

These when objects can be used in a <link> to relate time events to points in the text.

Aggregating non-continguous elements

The `<join>` element is used like `<link>`, pointing to 2 or more identified fragments of text. It claims that they could be joined to create a new virtual element (the @*result* attribute). `<joinGroup>` is provided to aggregate `<join>`s.

<join> example source

```
<lg>
  <l>
    <seg  xml:id="L1">E</seg>lizabeth it is in vain you say</l>
  <l>"<seg  xml:id="L2">L</seg>ove not" – thou sayest it in so sweet a way:</l>
  <l>
    <seg  xml:id="L3">I</seg>n vain those words from thee or L.E.L.</l>
  <l>
    <seg  xml:id="L4">Z</seg>antippe's talents had enforced so well:</l>
  <l>
    <seg  xml:id="L5">A</seg>h! if that language from thy heart arise,</l>
  <l>
    <seg  xml:id="L6">B</seg>reath it less gently forth – and veil thine eyes.</l>
  <l>
    <seg  xml:id="L7">E</seg>ndymion, recollect, when Luna tried</l>
  <l>
    <seg  xml:id="L8">T</seg>o cure his love – was cured of all beside –</l>
  <l>
    <seg  xml:id="L9">H</seg>is follie – pride – and passion – for he died.</l>
</lg>
```

<join> example

```
<p>
 <join
    targets="#L1 #L2 #L3 #L4 #L5 #L6 #L7 #L8 #L9"  result="name">
   <desc>The beloved's name</desc>
 </join>
</p>
```

(from Edgar Allan Poe).

Elements as alternatives to one another

The <alt> element is used to indicate that two elements are mutually exclusive. <altGroup> is provided to aggregate <alt>s.

Example: the first time we transcribed this text, we saw

```
<ab>WILLILAM W. AND EMELYN STORY</ab>
```

but on another look it says

```
<ab>WILLIAM W. AND EMELYN STORY</ab>
```

Can this be a genuine change since our first visit? or just a mistake? Let's keep both:

```
<ab xml:id="W1">WILLILAM W. AND EMELYN STORY</ab>
<ab xml:id="W2">WILLIAM W. AND EMELYN STORY</ab>
<alt mode="excl" targets="#W1 #W2"/>
```

@weights and *@mode* assign weight to the judgement, and allow for relationships other than mutually-exclusive.

Another way to express alternation

The global *@exclude* attribute can be used by any element to indicate another element to which it is allergic:

```
<ab exclude="#W4" xml:id="W3">WILLILAM W. AND EMELYN STORY</ab>
<ab exclude="#W3" xml:id="W4">WILLIAM W. AND EMELYN STORY</ab>
```

Conclusions

The linking module provides a wide range of tools to let you describe relationships between parts of your text. If you need these, remember:

- You should work out a naming scheme to assign ID attributes. You will need a lot of them
- There are often several ways to do things; use the more specialized markup when you can to make it easier for others to read. Don't rely on @*type* attributes with undefined meanings everywhere
- Control your vocabulary for token attributes like @*type*
- The TEI only takes you as far as *markup*. Implementing all this to make a fancy interactive text exploration web site may be a lot of work.