Increasingly people want to do not just 'text' editions but text editions with facing page (or otherwise linked) facsimimile images. Indeed, some people want to just have images and create an electronic facsimimile (perhaps with a view to later eventual transcription). The `<facsimile>` element (a sibling of `<teiHeader>`) and `<text>` is provided to accommodate this desire.
Digital Facsimiles

- `<facsimile>` contains a representation of some written source in the form of a set of images rather than as transcribed or encoded text
- `<surface>` defines a written surface in terms of a rectangular coordinate space
  - `@start` points to an element which encodes the starting position of the text
- `<zone>` defines a rectangular area contained within a `<surface>` element
- Global `@facs` (facsimile) points directly to an image, or to a part of a facsimile element which corresponds with this element.
Simplest case: 1:1 mapping with @facs

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
<text>
  <body>
    <pb facs="147_13.jpg" n="13"/>
    <div>
      <head>ESSENCE OF PARLIAMENT.</head>
      <p>!--- Page 13 continues --->
    </p>
    <pb facs="147_14.jpg" n="14"/>
    <p>Business done. -- The Commons still...
    </p>
    <!-- Page 14 continues -->
  </div>
  </body>
</text>
```
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 surface and link such elements to digital facsimile images of them
The facsimile element is used to represent a digital facsimile. It appears within a TEI document along with, or instead of, the text element introduced in section 5 Default Text Structure. When this module is selected therefore, a legal TEI document may thus comprise any of the following:

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

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- a TEI Header and a text element
- a TEI Header and a facsimile element
- a TEI Header, a facsimile element, and a text element
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- a TEI Header and a text element
- a TEI Header and a facsimile element
- a TEI Header, a facsimile element, and a text element
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Example in Context

```xml
<TEI>
  <teiHeader>
  <!-- teiHeader here -->
  </teiHeader>
  <facsimile>
    <graphic url="147_13.jpg" xml:id="p1"/>
    <graphic url="147_14.jpg" xml:id="p2"/>
    <graphic url="147_15.jpg" xml:id="p3"/>
  </facsimile>
  <text>
    <body>
    <!-- body here -->
    </body>
  </text>
</TEI>
```
The `<surface>` element may be used to indicate that there are two image files corresponding with the same area of the work:

```
<facsimile>
  <surface>
    <graphic url="147_13.jpg"/>
    <graphic url="147_13-huge.jpg"/>
  </surface>
  <graphic url="147_14.jpg"/>
  <graphic url="147_15.jpg"/>
  <graphic url="147_16.jpg"/>
</facsimile>
```
dimensions

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.
Example drawing rectangles
<facsimile>
  <surface ulx="0" uly="0" lrx="700" lry="1000">
  <!-- ... -->
  </surface>
</facsimile>
To describe the whole image, we will also need to define a zone of interest which represents an area inside this surface. This zone of interest can be defined by a `<zone>` element, within which we can place the `<graphic>`:

```
<facsimile>
  <surface ulx="0" uly="0" lrx="993" lry="1639">
    <zone ulx="93" uly="681" lrx="967" lry="1568">
      <graphic url="147_13.jpg"/>
    </zone>
  </surface>
</facsimile>
```
The <desc> element may also be used within either <surface> or <zone> to provide some further information about the area being defined.
<desc> Example </desc>

<facsimile>
  <surface ulx="0" uly="0" lrx="993" lry="1639">
    <desc>Printed page</desc>
    <zone ulx="96" uly="89" lrx="750" lry="657">
      <desc>Cartoon</desc>
      <graphic url="147_13.jpg"/>
    </zone>
    <zone ulx="95" uly="681" lrx="990" lry="1568">
      <desc>Text section</desc>
      <graphic url="147_13.jpg"/>
    </zone>
  </surface>
</facsimile>
More uses for `<zone>`

In addition to acting as a container for `<graphic>` elements, `<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">
    <desc>main text</desc>
    <zone ulx="393" uly="681" lrx="967" lry="890">
      <desc>Cartoon</desc>
      <graphic url="147_13.jpg"/>
    </zone>
    <zone ulx="507" uly="596" lrx="704" lry="768">
      <desc>Artist's signature</desc>
    </zone>
  </surface>
</facsimile>
```
Linking transcription and facsimile

1. Give each relevant part of the facsimile an identifier.
2. Using the @facs attribute, point from the transcription into the <facsimile>.
Linking transcription and facsimile: `<facsimile>`
<body>
  <pb n="p10"/>
  <div facs="#cartoonfacs">
    <figure>
      <!-- cartoon info here -->
    </figure>
  </div>
  <div facs="#textfacs">
    <head>THE WALKERS</head>
    <lg>
      <l>There were eight pretty walkers...</l>
    </lg>
  </div>
</body>
Pointing from `<facsimile>` to transcription with `@start` attribute

It is also possible to point in the other direction, from a `<surface>` or `<zone>` to the corresponding text. This is the function of the `@start` attribute, which supplies the identifier of the element containing the transcribed text found within the `<surface>` or `<zone>` concerned.
@start attribute example: <facsimile>

<facsimile>
  <surface start="#p10" ulx="0" uly="0" lrx="993" lry="1639">
    <zone xml:id="cartoonfacs2" ulx="96" uly="89" lrx="950" lry="657">
      <desc>Cartoon</desc>
      <graphic url="147_10.jpg"/>
    </zone>
  </surface>
</facsimile>
@start attribute example: text

<body>
  <pb xml:id="p10" n="10"/>
  <div>
    <figure>
      <!-- cartoon info here -->
    </figure>
  </div>
  <div>
    <head>THE WALKERS</head>
    <lg>
      <l>There were eight pretty walkers...</l>
    </lg>
  </div>
</body>
Gravestone Example: <facsimile>

<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>
<div facs="#grave">
  <p>Private Moulds' gravestone</p>
  <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>
      <lb/>
    </ab>
  </div>
</div>
Gravestone Example: rendered

Introducing the Image Markup Tool

- Written by Martin Holmes at University of Victoria
- Allows image annotation
- Saves its files as pure TEI P5
- http://www.tapor.uvic.ca/~mholmes/image_markup/
- Main window tutorial
- Annotation window tutorial
IMT: main window

IMT main window:
Introducing the Image Markup Tool

IMT: annotation window

**IMT annotation window:**
Loading and Using Images

Loading Images:
- **File / New:** starts new image
- **File / Import:** option of keeping existing annotations and applying to new image

Using Images:
- **Zooming:** scale toolbar box, or Control + mousewheel
- **Scrolling:** mousewheel (up/down); Shift + mousewheel (left-right), or scrollbars
Defining and Editing Categories

- IMT makes you sort your annotations into categories (but which and how many are up to you!)
- You use the 'category manager' to create categories where you can define:
  - an xml:id for identification
  - a title/description of the category
  - a colour for the annotation lines on the image
  - a shape: rectangle (default and only one used in web view), ellipse, cross or spiral
Adding and Deleting Annotation Areas

- Click on 'Annotations / New annotation' (or button), and a resizable shape will appear on the image.
- You can resize and move the area with the mouse.
- The area, when selected, will have a white bounding box -- otherwise it will be the colour of its category.
- The shape depends on the defined shape in the category you've chosen.
- To delete, select it and then click on 'Annotations / Delete annotation' or button -- the associated annotations will also be deleted.
Adding Annotation Text

- When an annotation is added, it has the last category you used.
- You can change this to any other category.
- You can provide an annotation title (stored as tei:head).
- You can provide some text (any tei:div content, tei:p default).
- You can change the generated xml:id with the ID button.
Hiding and Showing Annotations

- You can hide and show annotations in the annotations window.
- You can select either individual annotations to display.
- Or you can choose not to display a whole category of annotations.
- This is useful when working with lots of overlapping annotations.
Creating a "Web View"

- As an example IMT produces a 'web view'
- This includes a web page, with slightly shrunk image, where your annotations appear as mouse-over outlines with boxes displaying the annotations
- Double-clicking on an annotation area produces a zoomed in version of the image for that area
- This is really just a proofing tool, but has been used by some as the basis for annotated facsimiles
Introducing the Image Markup Tool

Punch
Since *Punch* has so many cartoons, mixed in with text, the output from the IMT could be used with great effect. For example: http://tei.oucs.ox.ac.uk/Oxford/2009-04-galway/Punch-IMT/

For example: http://www.rch.uky.edu/Pembroke25/IMT/3r/3r.htm uses a customised IMT Web View to provide both line-by-line transcriptions and editorial notes.
It is important quickly to note that IMT XML files are pure TEI P5 XML. The RelaxNG schema is available with the installed program, as is the TEI ODD file that Roma uses to generate this schema.