Christian Terstegge, Martin Warnke, Carmen Wedemeyer

PeTAL: a Proposal of an XML Standard for the Visual Arts

PeTAL (Picture Text Annotation Language) is proposed as an XML-standard for digital documents containing text, images, and videos with heavy cross-referencing, esp. from clickable parts of images to other parts of the material. A browser capable of interpreting the PeTAL code shown here is under construction.

Motivation and scope of the PeTAL standard

Having worked on digital documentations of pieces of visual art for more than a decade [1, 2, 3, 4], we propose an XML standard to describe digital documents that contain pictures, text and audiovisual material with lots of cross-referencing between parts of these material types. The reasons for our XML proposal are the following:

– Every major change in information technology in the past forced us to rewrite all of the access software for the collected multimedia documents. XML is a good candidate to get rid of this problem in major aspects.
– After having rewritten some projects to fit several different software platforms we now hope to know which parts and elements of our coding and retrieval are essential to document collections that make heavy use of pictures, texts, and multimedia material with extensive indexing and cross referencing irrespective of the particular hardware and software platforms used. For an example of an HTML-version of one of our projects see http://btva.uni-lueneburg.de/.
– Since the development of retrieval and browsing software for documents is such a laborious process we hope to simplify this by a solid

standard on which to build a browsing procedure that adopts our XML proposal, serving the needs of a broad audience. After feedback from the scientific community we will further develop our browsing software and think about the development of browser plug-ins.

Work Environment

Fig. 1 shows our working environment. Collection of the data is done

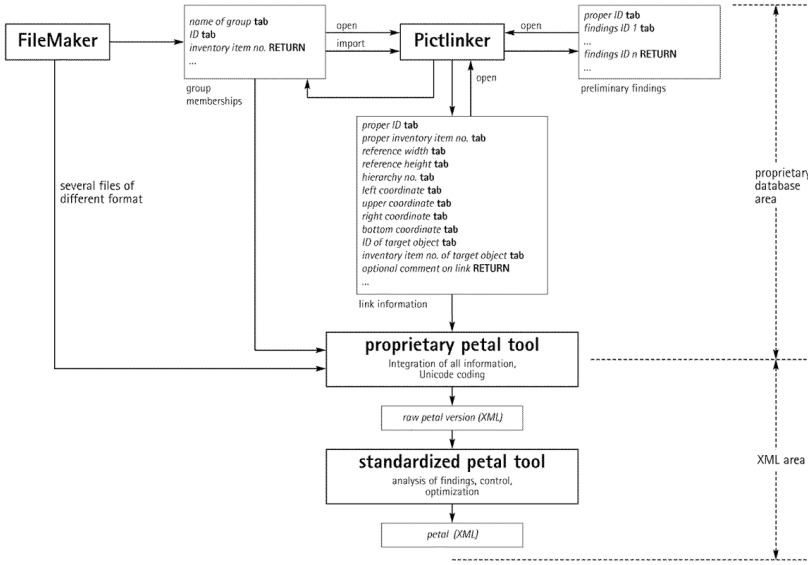

Fig. 1: Working environment

using standard database software (FileMaker Pro) and a proprietary tool (called »Pictlinker«). All data formats are plain ASCII (tab-return structure) or standard image formats. With the Pictlinker tool we do the picture cross-referencing and the structuring of the image collection into groups. Clickable areas that link to other images are edited, the information which links point to a specified picture element (the »findings«) and the group and group membership lists are generated here.

A proprietary tool collects and compiles all information into a first level of PeTAL code (prePeTAL), obeying the XML specifications. Other projects could have different work environment at this stage.

Maybe it is convenient to use different database software, maybe hand coding of the PeTAL code is appropriate.

This prePeTAL code then is optimized for browsing with a standardized PeTAL tool. It does an analysis of the findings, which is actually an inverted index, to be able to access all places where links point to the element under consideration without having to search all link lists at run time. It optimizes the PeTAL code for shortness and better control. The result is the optimized PeTAL code version of the document collection. A standardized browser then renders all structure and content for the computer screen.

Documents with Pictorial Cross References

As a first example of PeTAL code a picture is shown which contains clickable areas that refer to other images (`<area>`-tag). Areas are similar to clickable maps in HTML, but are ordered, refer to objects with an inventory number, rather than a physical address, mainly to other images, but also texts and videos. The coordinates of the areas are relative to reference dimensions, which allows changing picture files without having to recode the area coordinates.

The representation of a picture-element is associated with a thumbnail picture and a magnified version to zoom in while browsing. There are comments, containing metadata that are displayed to the user of the document collection. There is also a list compiled by the PeTAL tool that indicates which elements point to the one under consideration (the `<sites>`-tag).

The difference to plain HTML is that the code is minimal for the special purpose of the organization and display of images, texts, and videos with cross referencing and indexing, and that users don't have to care about the actual rendering of the material on screen. Our browser that already has basic functionality and will be developed to full extend does this. Needless to say, anybody could build an own browser according to our PeTAL standard.

This is the PeTAL code for the picture with inventory code »49_2_68_V« with all of its cross references:

```
<!DOCTYPE petal>
<petal>
  <element type="pict" inv-id="538" inv-code="49_2_68_V">
    <img use="thumb" src="thumbs/538.jpg"/>
    <img use="normal" src="picts/538.jpg"/>
    <img use="magnification" factor="2.0" src="magnifications/
538.jpg"/>
    <text xml:lang="de">
      <title>Aufbau Frankfurt - Klassik</title>
     <material>Bleistift und Buntstift (orange, rot, gelb) auf
Papier</material>
      <comment>Inventarbezeichnung:
&#34;49_2_68_V&#34;<br><br>Vergl. hierzu das Foto       <a
ref="716" type="pict"/>49_3_35.<br><br><a ref="537"
type="pict"/>       R&#252;ckseite</comment>
      <date></date><x>14,8 cm</x><y>15,2 cm</y><z>0,0 cm</z>
    </text>
    <text xml:lang="en">
      <title>Assemblage Frankfurt - classical period</title>
      <material>Pencil and crayon (orange, red, yellow) on
paper</material>
      <comment>inventary code: &#34;49_2_68_V&#34;<br><br>Cf.
the photo <a ref="716"       type="pict"/>49_3_35.<br><br><a
ref="537" type="pict"/>reverse side</comment>
      <date></date><x>14.8 cm</x><y>15.2 cm</y><z>0.0 cm</z>
    </text>

    <sites size="17">5009, 1518, 1514, 1475, 1452, 1327, 763,
848, 1263, 1264, 1265,     700, 1324, 1692, 1260, 1252, 1486</
sites>

    <area order="1" shape="rect" coords="7, 257, 143, 423" ref-
dim="431, 448">
      <element type="pict" inv-id="698"/>
    </area>
    <area order="2" shape="rect" coords="61, 64, 159, 204" ref-
dim="431, 448">
      <element type="pict" inv-id="1143"/>
    </area>
    <area order="3" shape="rect" coords="286, 194, 414, 416"
ref-dim="431, 448">
      <element type="text" inv-id="10465"/>
    </area>
    <area order="4" shape="rect" coords="176, 350, 254, 430"
ref-dim="431, 448">
      <element type="text" inv-id="10466"/>
      <text xml:lang="de">
        <comment>Als Projektionsfläche für den Text dient
49_3_55.</comment>
```

```
      </text>
    </area>
    <area order="5" shape="rect" coords="180, 62, 375, 387" ref-
dim="431, 448">
      <element type="pict" inv-id="1073"/>
    </area>
  </element>
</petal>
```

Mouse clicks on one of the five areas localizing the iconographical details of the drawing (see right part of fig. 2) takes the viewer to the representation of that element where again other details may be found. Hypertext links are coded by our variant of the `<a>`-tag and are visualized by a special graphical symbol in our browser.

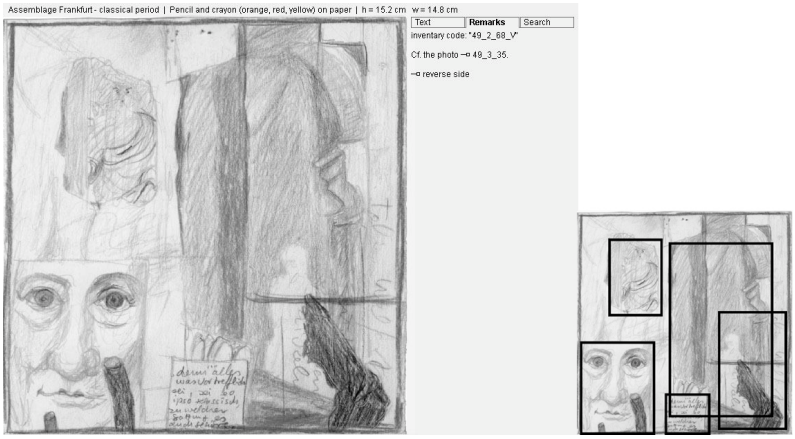

Fig. 2: Picture element as shown with the browser (l) and a sketch of the `<area>` regions (r)

PeTAL coded document collection (group)

Groups are named sets of elements. Their inventory number references the elements; the browser shows thumbnails of the group elements and takes the viewer to the full screen graphical representation of the element when clicking on them. Shown below is the XML source code of such a group and the rendering by our browser (fig. 3):

```
<!DOCTYPE petal>
<petal>
  <group inv-id="7520">
    <text xml:lang="de">
      <name>Goethedenkmal in Ffm</name>
    </text>
    <text xml:lang="en">
      <name>Goethedenkmal in Ffm</name>
    </text>
    <content size="25">
      <element inv-id="678" type="pict"/>
      <element inv-id="854" type="pict"/>
      <element inv-id="803" type="pict"/>
      <element inv-id="951" type="pict"/>
      <element inv-id="665" type="pict"/>
      <element inv-id="1194" type="pict"/>
      <element inv-id="1164" type="pict"/>
      <element inv-id="1519" type="pict"/>
      <element inv-id="688" type="pict"/>
      <element inv-id="672" type="pict"/>
      <element inv-id="824" type="pict"/>
      <element inv-id="685" type="pict"/>
      <element inv-id="686" type="pict"/>
      <element inv-id="1288" type="pict"/>
      <element inv-id="928" type="pict"/>
      <element inv-id="647" type="pict"/>
      <element inv-id="1525" type="pict"/>
      <element inv-id="1385" type="pict"/>
      <element inv-id="1017" type="pict"/>
      <element inv-id="612" type="pict"/>
      <element inv-id="613" type="pict"/>
      <element inv-id="489" type="pict"/>
      <element inv-id="920" type="pict"/>
      <element inv-id="372" type="pict"/>
    </content>
  </group>
</petal>
```

Fig. 3: Rendering of a group

Documents with Digital Video

Digital video is another type of element in PeTAL. Particular to a video is its time-based structure. So there is a `begin` and an `end` and subtitles based on a common time code. Below is the code; fig. 4 shows the rendering in the browser. Video controls are included automatically.

```
<!DOCTYPE petal>
<petal>
  <element type="video" inv-id="7814" begin="0" end="2370">
    <video use="normal" src="videos/stuttgart.mov"
    <text xml:lang="de">
      <title>ARD: Ausstellung &#34;Vergangenheit, Gegenwart,
Zukunft&#34; im       W&#252;rtembergischen Kunstverein, Stutt-
gart 1982</title>
    </text>
    <text xml:lang="en">
      <title>ARD: Exhibition &#34;Vergangenheit, Gegenwart,
Zukunft (Past,  Present       and Future)&#34; im W&#252;rtem-
bergischen Kunstverein, Stuttgart 1982</name>
    </title>
    <subtitle xml:lang="en" size="8">
```

```
      <str timecode="113">Anna Oppermann - her aspiration: to
depict the bustle and       commotion surrounding Goethe to
lavish excess</str>
      str timecode="383">and in doing so, to lead the public to
a greater awareness       of the diversity and complexity of
Germany's greatest poet.</str>
      str timecode="692">Images, textual extracts and quotati-
ons are presented in       extravagant assemblages.</str>
      <str timecode="914">The German oak as tree of culture and
quote upon quote,       even insults from the Romantic poet,
Novalis.</str>
      <str timecode="1356">An altar for Goethe: a symbolization
of the apparent       sacrosanct glorification of a poet who
many Germans have not even read.</str>
      <str timecode="1529">In working with her source material,
Anna Oppermann has       experienced both conflict and pertur-
bation, a situation in which many Germans       have found them-
selves.</str>
      <str timecode="1882">My attitude and approach to each
quote is actually clear       from the arrangement.", "Did you
feel you got closer to Goethe?</str>
      <str timecode="2047">Well, I wouldn't say he became more
amiable, but, of       course I certainly owe him a certain
degree of respect. That's fairly clear.       </str>
    </subtitle>
</element>
</petal>
```

Fig. 4: Rendering of a digital video with subtitles

Conclusion

The very point of our work is the relationship between the standardization – that makes life easier – and the broadness of applicability – what suspends standardization. So everything depends on the usability and versatility of our proposal. Please feel free to give us feedback.

References

[1] Martin Warnke: »Das Thema ist die ganze Welt: Hypertext im Museum«, in: Peter A. Gloor/Norbert A. Streitz (Hg.): Hypertext und Hypermedia. Informatik-Fachberichte 249. Berlin, Heidelberg, New York: Springer-Verlag 1990, S. 268-277.

[2] Martin Warnke: »A World in a Nutshell: The Project EbsKart«, in: Joergen Marker (Hg.): AHC '91: History and Computing, Odense: Odense University Press 1991.

[3] Martin Warnke/Paul Ferdinand Siegert and Carmen Wedemeyer: »Database Publishing Without Databases«, in: David Bearman/Jennifer Trant (Hg.): Museums and the Web, 1999, on CD-ROM »file:///MW99/papers/warnke/warnke.html«.

[4] Carmen Wedemeyer: Umarmungen…/Embraces – Anna Oppermann's Ensemble ›Umarmungen, Unerklärliches und eine Gedichtzeile von R.M.R.‹. 1998, w. CD-ROM.

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