

White Paper Report

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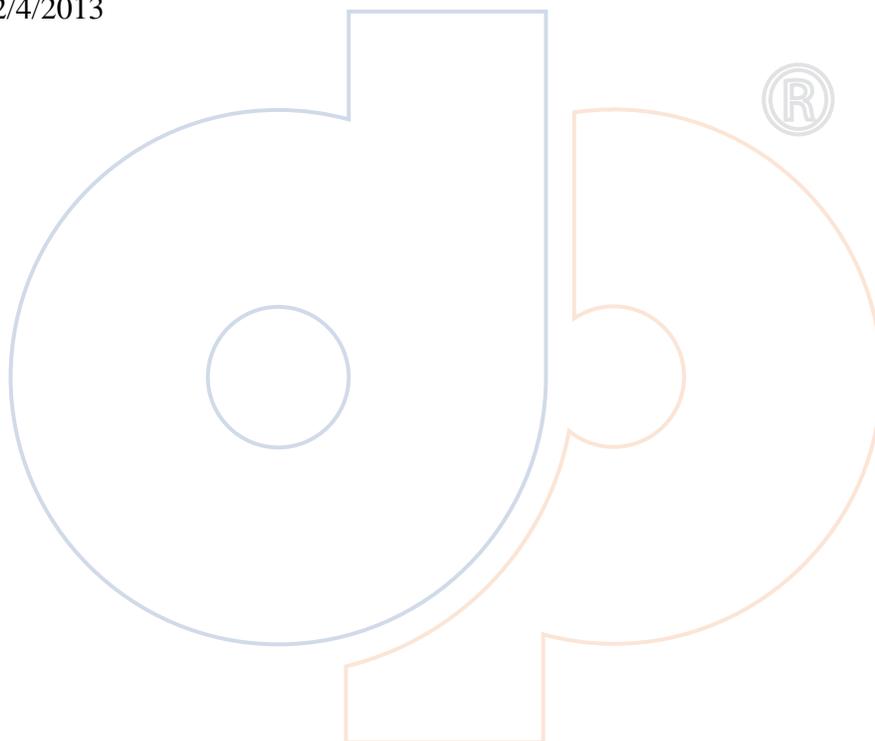
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Cover Page—White Papers

Final Performance Report NEH/DFG Digital Humanities

Grant # A2763 HG-50004-09
“Emblematica Online”

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4 February 2013

Emblematica Online: Emblem Digitization, The German Emblem Database, and The OpenEmblem Portal

<http://emblematica.granger.illinois.edu/>

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List of White Papers

1. Iconclass and Linked Open Data (LOD)
2. OpenEmblem Portal
3. SPINE Metadata Standard: Describing Emblem Books and Emblem Components Together

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White Paper 1

Iconclass and Linked Open Data (LOD): Leveraging Semantic Web Technologies to Enhance Discovery

Iconclass browsing and navigation functionality is built into the Open Emblem portal. Users can browse the Iconclass hierarchy in their preferred language to discover digitized emblem content. This flexibility is accomplished without having to have a local copy of the complete thesaurus through JavaScript (AJAX) calls to Iconclass Web services. Figure 1 shows the RDF returned for the Iconclass Notation, "25F33(EAGLE)." RDF like this example was used to generate the multi-lingual display. For better performance and to avoid cross-domain scripting errors, a local short-term caching proxy service is used.

```
<rdf:RDF>
  <rdf:Description rdf:about="http://iconclass.org/25F33%28EAGLE%29">
    <rdf:type rdf:resource="http://www.w3.org/2004/02/skos/core#Concept"/>
    <skos:prefLabel xml:lang="fr">oiseaux de proie : aigle</skos:prefLabel>
    <skos:prefLabel xml:lang="en">predatory birds: eagle</skos:prefLabel>
    <skos:prefLabel xml:lang="de">Greifvögel: Adler</skos:prefLabel>
    <skos:prefLabel xml:lang="it">uccelli rapaci: aquila</skos:prefLabel>
    <skos:inScheme rdf:resource="http://iconclass.org/rdf/2011/09"/>
    <skos:notation>25F33 (EAGLE)</skos:notation>
    <skos:narrower rdf:resource="http://iconclass.org/25F33%28EAGLE%29%28%2B0%29"/>
    <skos:narrower rdf:resource="http://iconclass.org/25F33%28EAGLE%29%28%2B1%29"/>
    <skos:narrower rdf:resource="http://iconclass.org/25F33%28EAGLE%29%28%2B2%29"/>
    ...
    <skos:narrower rdf:resource="http://iconclass.org/25FF33%28EAGLE%29"/>
    <skos:related rdf:resource="http://iconclass.org/25Fk12"/>
    <skos:broader rdf:resource="http://iconclass.org/25F33%28...%29"/>
  </rdf:Description>
</rdf:RDF>
```

Figure 1: Iconclass heading 25F33(EAGLE) expressed in RDF/XML.

Figure 2 shows one way the prototype portal allows end-users to leverage Iconclass browsing to find emblems. In the scenario illustrated, a user has found emblem 24 (pp. 56-57, "Den Armen schafft man billich Rath.") from Johann Vogel's *Meditationes Emblematicae de Restaurata Pace Germaniae* [x]. One of the Iconclass headings assigned to the pictura of this emblem is 25F33(EAGLE)(+5245), "predatory birds: eagle (+ animal(s) holding something)." As illustrated in Figure 12, the user can move from the display of detailed emblem metadata to a view of the Iconclass hierarchy centered on this particular Iconclass heading (i.e., under another tab of the interface). The user may then browse up or down the hierarchy, and at any point selecting a heading for a new search in the portal. In this instance the user browses up the hierarchy to 25F, "animals," then down the hierarchy to search on 25F23(...), "beasts of prey, predatory animals (with NAME)." This search retrieves several *picturae* and associated emblems, including the ones shown in Figure 2 ([x], [x]). Iconclass headings assigned to emblem *picturae* are indexed locally in English and in the modern version of the language of the emblem. Notation codes are also indexed to take advantage of the hierarchical structure of

Iconclass codes, so that searches retrieve *picturae* with exactly matched headings and any *picturae* with a heading below the requested heading in the Iconclass hierarchy.

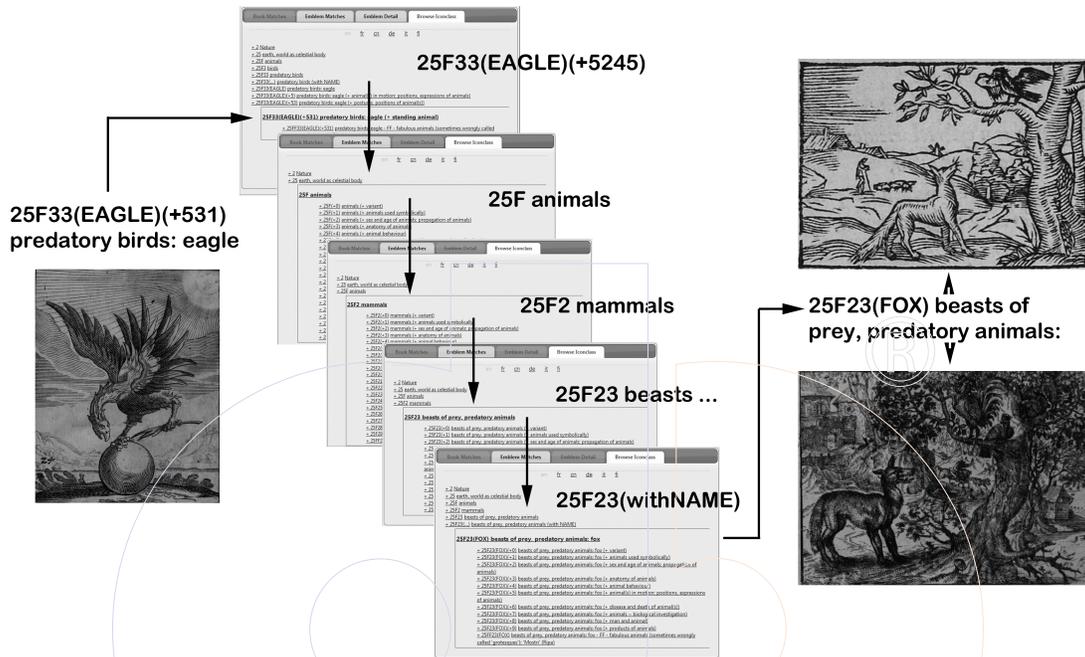


Figure 2: The portal allows end-users to leverage Iconclass browsing to find emblems.

Beyond increases in size and scope, there is the growing need to further develop our approach to relationship metadata -- e.g., to make digitized emblem books more useful in an increasingly Semantic Web and Linked Data world. This might entail converting the Spine metadata schema to be more Linked Data friendly (as mentioned above), adding RDFa to emblem landing pages, and/or linking with other authoritative data sets beyond Iconclass, e.g., name authorities, thesauri of geographic terms, and even indices of historic events or literatures pertinent to emblem resources. This will allow us to better support increasingly demanding expectations of digital humanities scholars, who have come to expect that technology should:

- facilitate discovery of and access to more and more richly described digital surrogates for primary sources;
- enable more scholars to more easily interact with content at the margins of their primary domain, bringing to bear as they do so broader and more diverse ranges of competencies;
- encourage broader collaboration and discourse over a wide range of content available in new and different ways.

This view recognizes that the lifeblood of humanities scholarship and pedagogy has been and continues to be engagement and discourse, underpinned by curated collections of well-described primary sources of verifiable provenance. The essential predicates for this emerging vision of Digital Humanities 2.0 are multilingual and transnational digital

archives, ubiquitously available, collaboratively curated by librarians and scholars, and managed so as to support multi-modal discovery and access at multiple levels of granularity. In her paper, "Humanities 2.0: Promises, Perils, Predictions," Cathy Davidson outlines a broad, coherent vision of Digital Humanities 2.0 along these lines and describes its implications for scholarly practice. A prerequisite for her vision is increased access to and sharing of information. "Hybridity, exchange, flow, and cultural transaction are all explored more responsibly and adventurously when the resources of many nations, in many languages, have been digitized, made interoperable, and offered for research by scholars around the world, each of whom brings a local store of knowledge and experience to the theoretical, interpretive enterprise" ([9], p. 710). The core long-term goal of the *Emblematica Online* project to enhance emblem literature access and sharing is well aligned with this vision. Illustrative of this view of Humanities 2.0 is recent work to support interoperable scholarly annotation of digital resources, e.g., the Open Annotation Collaboration.¹ This work in turn prompted an early experiment examining how an annotation facility might be added to a future iteration of the Open Emblem Portal. In this experiment, selected emblem metadata records (conforming to the Spine schema discussed above) were made available for annotation by a few scholars and graduate students using browser-based and desktop annotation tools. To avoid having to duplicate copies of Spine metadata records, the experiment was carried out by exploiting built-in Web server proxy features and implementing conditional stylesheet transformations based on whether an emblem description is being served directly or by proxy. Figure 3 illustrates one of the annotations created. The annotation tool interface was simplistic and constrained, and testing was not systematic. Nonetheless, the experiment generated enthusiasm on the part of the users involved and confirmed that our underlying use of identifiers and Spine metadata records is on the right track to support further annotation experiments. Consistently and openly available structured representations of annotation have the potential to facilitate interactivity with primary sources, discourse involving these resources, and collaborative curation of these resources.

¹ <http://www.openannotation.org/>

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OpenEmblem Portal Development

Providing Granular Levels of Search and Discovery Services

Emblem literature poses several challenges for portal designers, some that resonate with issues common across many web-based library applications and some that are more unique to the domain. Additionally, we are cognizant that the members of our primary audience, emblem studies scholars, are sophisticated information seekers, intuitively aware of complex relationships between image and text, between emblems, between emblem books, and between specific emblems and particular copies or editions of emblem books. They need and expect multiple ways to discover and retrieve emblem resources. Emblem resources are also of scholarly interest to other domain scholars -- e.g., art historians, social historians, religious studies scholars -- many of whom also have advanced needs and expectations of portal functionality. In developing the prototype OpenEmblem Portal for this project we strove to accommodate requirements that the portal be able to support:

- search at multiple granularities, e.g., bibliographic search of book-level descriptions simultaneous with keyword search emblem mottos, simultaneous with search of controlled vocabulary pictura/emblem-level descriptors;
- presentation of results at multiple levels of granularity with links to context, e.g., the ability to discover books and emblems independently while still being able to link from one to the other;
- advanced browsing, using not only pre-coordinated links between resources, but also 'more-like-this' browsing, e.g., find more emblem books by same author or find more emblem picturae having the same or related Iconclass descriptors;
- explicit links back to views of emblems and emblem books in context of owning institution collections of which the emblem book digitized is a part;

The prototype OpenEmblem Portal that was developed as part of the Emblematica Online project provides enhanced discovery and access to digital emblem resources from two institutions, the University of Illinois at Urbana-Champaign (UIUC) and the Herzog August Bibliothek, Wolfenbüttel (HAB), as well as sample records from Utrecht University and Glasgow University digital emblem collections. The design of this portal supports access to digitized content at two different levels; i.e., book and emblem level, to facilitate the granular levels of metadata we have created (see separate white paper). Users can use the OpenEmblem Portal to search keywords across all granularities (Figure 1). Or, more innovatively, the interface can be used to build a search query that searches book metadata and emblem/pictura metadata simultaneously, with or without restrictions to specific fields (Figure 2). Or the user can enter the Emblematica Online virtual collection by browsing the Iconclass hierarchy, i.e., to discover emblem pictura relating to a particular topos or graphically expressed theme (Figure 3).

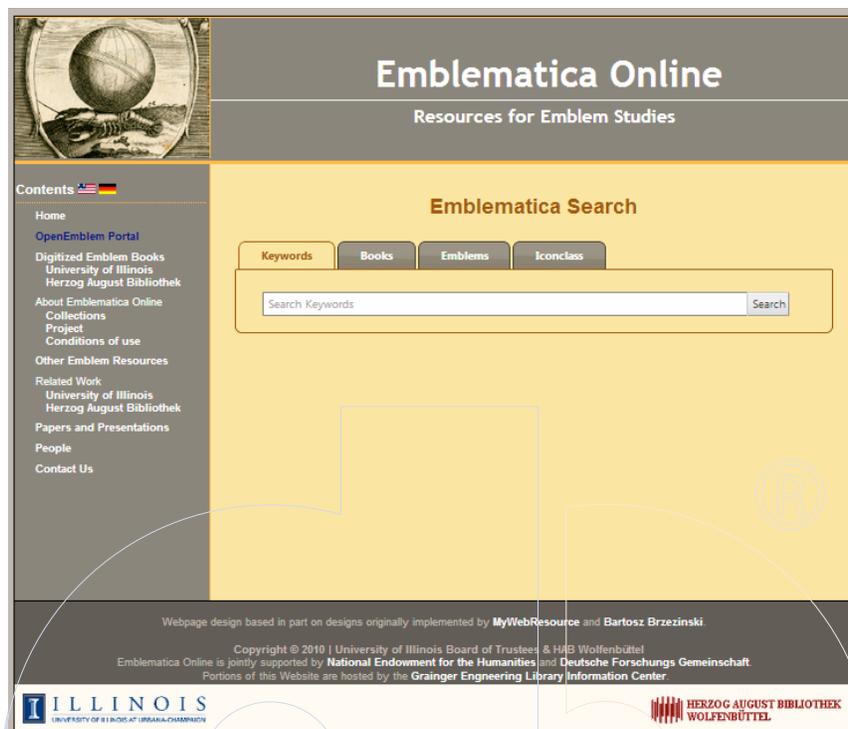


Figure1: OpenEmblem Portal allows simple searching by keyword.

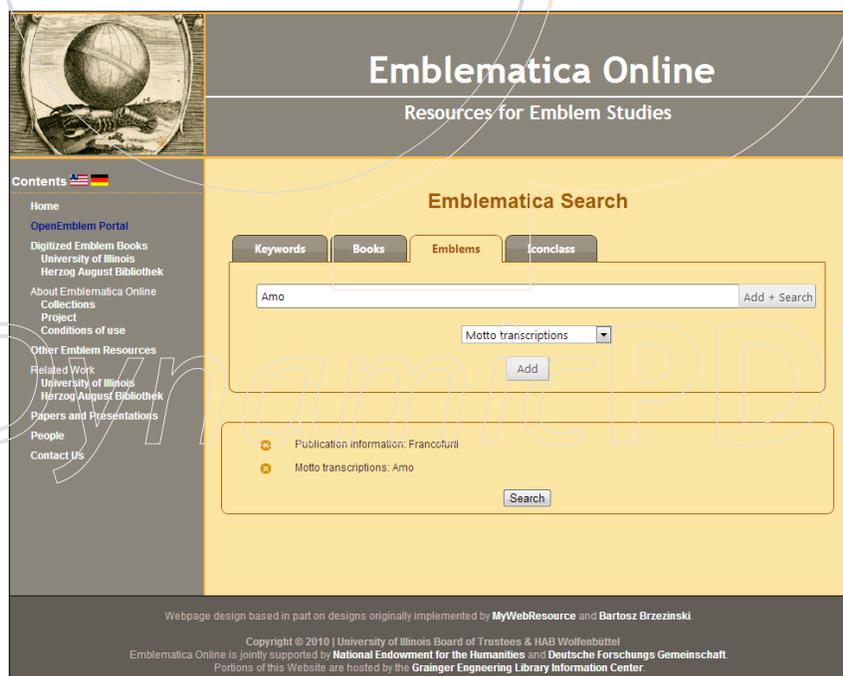


Figure 2: Alternatively OpenEmblem Portal allows searching by attributes spanning multiple granularities of description.

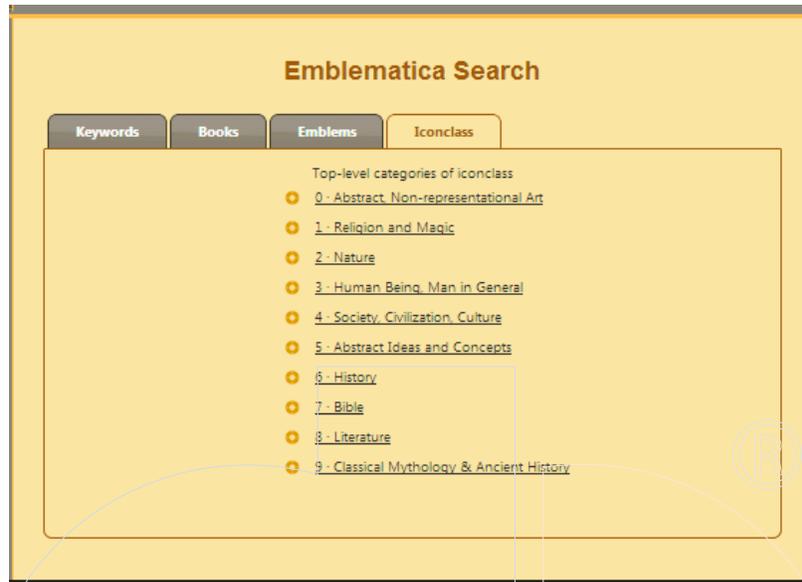


Figure 3: Alternatively OpenEmblem Portal allows browsing by Iconclass descriptors.

Book-level search results are displayed in the first tab, labeled "Book Results." When an item from that result list is selected, a complete display of book-level metadata is presented in this same tab, relabeled "Book Details." (Figure 4) This display includes a link to the digitized volume at Illinois or HAB, a link to the catalog record (at the owning institution) for the print book that has been digitized, and links to views of digital derivatives held at other locations, when applicable. The second tab (Figure 5), labeled "Emblems," provides (in a three-column view) thumbnail representations of emblems (*pictura* and motto) associated with a particular book or retrieved for a search (depending on context). Selecting an item from this display will activate a third tab (Figure 6), labeled "Emblem Detail," containing available metadata describing the entire emblem associated with the selected *pictura*. The detailed display of an emblem metadata record includes a transcribed motto and potentially other transcribed or normalized text associated with the emblem, a link to the description of the emblem book containing that emblem, the globally unique identifier of the emblem, links to the first page of the emblem on the HAB Website or to a single image complete view of the emblem on the Illinois Website, links to additional component views of the emblem when available (e.g., to the emblem's *pictura*), and links to Iconclass headings that have been assigned to the emblem.

Return to results list

BOOK INFORMATION

Book Title: Meditationes emblematicae de restaurata pace Germaniae = Sinnbilder von dem wiedergebrachten Teutschen Frieden

Authors and contributors: Vogel, Johann, 1589-1663 (creator)
Zunner, Johann David, d. 1653 (printer.)

Publisher: Apud Joh. Dav. Zunnerum

Publication Date: [1649]

Physical Description: print [5], XXIV, XXIV, [3] p. : ill. (engravings) ; 22 cm (4to)

Language: Latin
German

Notes: kürzlich erklärt durch Johann Vogel.
Publication date appears as chronogram on title-page.
Place of publication and printer from additional engraved title-page: "Meditationes de restaurata pace = Sinnbilder von dem wiedergebrachten Frieden in Teutschlandt / Johannis Vogelij]", with imprint: "Francofurti : Apud Joh. Dav. Zunnerum."
Opposite pages bear duplicate numbering.
Signatures: A-G.
Added title-page has ornamental border; initials; head-pieces; [24] engraved emblems.
"1649" inscribed in ink on title-page.
Text in Latin and German.

Links:
[Full text - UIUC](#)
[Full text - OCA](#)

Figure 4: Presentation of book-level bibliographic description of Johann Vogel's *Meditationes Emblematicae de Restaurata Pace Germaniae* (Frankfurt, 1649) in the "Book Details" tab.

Emblem Pictura from Selected Book

Viewing Emblems 1 - 18 of 24

[next page >>>](#)

Hie sol nun seyn deß Krieges Ziel.

Wie lieblich ist der Friedensbott!

Man preiß das Oel im End heraus.

Was du nicht glaubtest/ das geschicht.

Es blüht offtv/ was verdorret schien.

Der Baum fällt nicht von einem Streich.

Figure 3: In the "Emblems" tab, the portal displays *pictura* and motto for each emblem contained in the selected book, Johann Vogel's *Meditationes Emblematicae de Restaurata Pace Germaniae* (Frankfurt, 1649).

From Book Entitled:
Meditationes emblematicae de restaurata pace Germaniae =

EMBLEM IDENTIFIER: <http://hdl.handle.net/10111/EmblemRegistry:E000001>

Motto-Transcribed (de): Hic sol nun seyn deß Krieges Ziel.
Motto_Normalized: Hier soll nun des Krieges Ziel sein.

Motto-Transcribed (la): Hic belli terminus esto.

Emblem: View scanned image of Emblem
Pictura: View scanned image of Pictura
Iconclass headings: 22C11 rays of natural light
25H1124 boulder, stone
43A(+12) festivities (+ wreath, garland ~ festive activities); 25G3(OLIVE-TREE)(+27) trees: olive-tree (+ leaf)
45A20 symbols, allegories of peace, 'Pax'; 'Pace' (Ripa)
61A(1649) historical events and situations (with DATE)
61K(THIRTY YEARS' WAR) (other) historical names: (with NAME)
86(HIC BELLI TERMINUS ESTO) proverbs, sayings, etc. (with TEXT)
86(HIER SOLL NUN DES KRIEGES ZIEL SEIN), proverbs, sayings, etc. (with TEXT)
96A16 Terminus

Figure 4: In the "Emblem Details" tab, the portal displays the emblem-level description, including motto and Iconclass headings assigned to the emblem's *pictura*. The emblem shown in this figure is from Johann Vogel, *Meditationes Emblematicae de Restaurata Pace Germaniae* (Frankfurt, 1649), p. 10-11: emblem 1, "Hic sol nun seyn deß Krieges Ziel."

The tabbed interface approach² is designed to allow users to switch between granularity of emblem-related resource easily and quickly. A user can search for emblems by keyword(s) appearing in the transcription of the motto, view detailed metadata for one emblem discovered, link to the detailed record for the book containing that emblem, see the *pictura* and motto for each of the emblems contained in that book, select a different emblem to view in detail, and so on. The URLs generated when browsing tabbed views are all persistent, allowing Web browser bookmarking of individual book and emblem descriptions (subject to updates to the Portal's indexes). Searches can also be bookmarked; however, when a bookmarked search result is retrieved, the search will be re-executed (meaning additional results may be included if metadata records for new items have been added to the portal's index), and the search result list will always be refreshed to the top.

Functionally, another important feature of the OpenEmblem Portal is its support for linking from Iconclass headings of one emblem discovered to find other emblems having the same or related Iconclass descriptors. This is illustrated in a separate white paper.

² Reliance on tabbed interface motifs is now ubiquitous on the Web and integral to all major Web browsers. It is well recognized as helpful to usability and is particularly appropriate to our needs. Community best practices have emerged (e.g., <http://usabilitygeek.com/14-guidelines-for-web-site-tabs-usability/>). We relied on the widely used and well supported jQuery User Interface tabs implementation (<http://jqueryui.com/tabs/>).

White Paper 3

SPINE Metadata Standard: Describing Emblem Books and Emblem Components Together

Many of the Emblem books housed in both the University of Illinois at Urbana-Champaign (UIUC) and the Herzog August Bibliothek (HAB) were already well described as books in online catalog system before we began the Emblematica Online project. But each emblem book contains finer grained elements that are individually important to emblem scholarship and pedagogy as well. When digitizing an Emblem book, we should make these finer grained elements individually addressable and discoverable, while simultaneously maintaining access to the whole book as a discrete entity and as context for the more fine grained elements. This required us to have new metadata schema, SPINE, to support describing individual emblems.

The SPINE standard is based on a paper published by Stephen Rawles titled A SPINE of Information Headings for Emblem-Related Electronic Resources (2004). The major elements proposed by Rawles have been incorporated into a XML schema developed by Thomas Stacker at HAB. Stacker's schema also borrowed from the Text Encoding Initiative (TEI), in particular borrowing the `teiHeader` element which provides detailed semantics for book bibliographic description. The SPINE schema has been updated to version 1.2³ that also supports the Metadata Object Description Schema (MODS) as its book level description (Table 1).

Book Level Description	Digitized Copy Description	Emblem Level Description
MODS TEI Header (*Both are transformed from MARC format bibliographic records)	SPINE of Information <code><copyDesc></code> <i>Sub elements:</i> <code><copyID></code> <code><owner></code> <code><digDesc></code> <i>Attributes:</i> countryCode, comp, scope, xml:id, globalID, pageImages	SPINE of Information <code><emblem></code> <i>Sub elements:</i> <code><motto></code> <code><transcription></code> <code><pictura></code> <code><iconclass></code> SKOS/RDF <code><skos:notation></code> <code><skos:prefLabel></code> <code><subscriptio></code> <code><commentatio></code> <code><keyword></code> ... <i>Attributes:</i> xmlns:xlink, xml:id, citeNo, xlink:href, globalID, xml:lang, rdf:about

Table1: Elements and metadata schemas used in SPINE schema

The SPINE root element for description of an individual emblem volume contains three child components: `teiHeader` (or `MDOS`), `copyDesc`, and `emblem`. The `teiHeader` (or `MODS`) includes elements that work well for describing the bibliographic attributes of a specific edition or printing of an emblem book, i.e., the Emblem book considered as a Manifestation in Functional Requirements for Bibliographic Records (FRBR) Group 1 entities (IFLA Study Group).

³ <http://diglib.hab.de/rules/schema/emblem/emblem-1-2.xsd>

The copyDesc element (which can be repeated) is intended to describe “the copies on which the new digital works are based,” (Rawles 21). Thus the copyDesc element is used to record information, including ownership, regarding the physical copy or copies digitized as representative of the Emblem book printing or edition. The copyDesc element contains a sub-element, digDesc, describing digitization details for digital instances created from the specific physical copy.

Finally the emblem element (also repeatable) holds emblem-specific information, including information about emblem sub-components such as motto, pictura, subscriptio, etc. Room is provided in the schema at this level to record controlled vocabulary descriptors, e.g., Iconclass headings, describing each emblem and/or its child components. Because Iconclass headings have been translated into five languages (with more in prospect), resource descriptions that include Iconclass headings are immediately more discoverable in multiple languages.

```

rdf:RDF>
<rdf:Description rdf:about="http://iconclass.org/25F33%28EAGLE%29">
  <rdf:type rdf:resource="http://www.w3.org/2004/02/skos/core#Concept"/>
  <skos:prefLabel xml:lang="fr">oiseaux de proie : aigle</skos:prefLabel>
  <skos:prefLabel xml:lang="en">predatory birds: eagle</skos:prefLabel>
  <skos:prefLabel xml:lang="de">Greifvögel: Adler</skos:prefLabel>
  <skos:prefLabel xml:lang="it">uccelli rapaci: aquila</skos:prefLabel>
  <skos:prefLabel xml:lang="fi">petolinnut: kotka</skos:prefLabel>
  ...
</rdf:Description>
</rdf:RDF>

```

Figure 1: Iconclass vocabularies are available in multiple languages. Implementing linked data technologies, e.g., RDF and SKOS namespaces provides yet another layer of granular access service using a controlled vocabulary called Iconclass, a multilingual classification system for cultural heritage art and images. Iconclass is the only controlled vocabulary explicitly identified in the SPINE format (Rawles, 28) and has been embraced by the emblem community because it provides “a standardized controlled vocabulary [...] suitable for the description of emblematic images,” (Graham 16). Iconclass has a hierarchical structure and its vocabularies are currently available in five different languages. By using RDF and SKOS, emblem scholars can browse Iconclass vocabularies in different languages and view hierarchical relationships between vocabularies. RDF and SKOS also work as tools to enhance metadata in a more granular way. Since Iconclass vocabularies are available in multiple languages and RDF includes this information, as shown in Figure 1, metadata can now have terms in different languages, in addition to the vocabularies in the original language.

Our adoption of SPINE metadata (Figure 2) allows us to increase the functionality of the Open Emblem portal. SPINE metadata is semantically rich and includes a hierarchical structure that can span granularities of description. It simultaneously holds information for an emblem book as a manifestation, information regarding the exact print item or items digitized, as well as emblem-level information such as transcribed motto and pictura Iconclass descriptions. In the portal, scholars are able to search digital emblem resources at the book level, the emblem level, as well as the Iconclass headings.

```
<biblioDesc>
```

```

<mods>
  <mods:titleInfo>
    <mods:title>XL [i.e. Quadraginta] emblemata miscella nova</mods:title>
  </mods:titleInfo>
  <mods:physicalDescription>
    <mods:digitalOrigin>reformatted digital</mods:digitalOrigin>
    <mods:form authority="marcform">print</mods:form>
    <mods:extent>[8], xxxx p. : 41 ill. ; 20 cm.</mods:extent>
  </mods:physicalDescription>
  ...
</mods>
<copyDesc>
  <copyID>uiu2895515</copyID>
  <owner countryCode="US">University of Illinois</owner>
  <digDesc comp="complete" scope="all" xml:id="xliequadragintae00mure"
    globalID="http://hdl.handle.net/10111/UIUCOCA:xliequadragintae00mure">
    <copyID>10111/UIUCOCA:xliequadragintae00mure</copyID>
    <owner countryCode="US">University of Illinois</owner>
  </digDesc>
  ...
</copyDesc>
<emblem xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:skos="http://www.w3.org/2004/02/skos/core#" xml:id="E000944" citeNo="I."
  globalID="http://hdl.handle.net/10111/EmblemRegistry:E000944">
  <motto><transcription xml:lang="de">
    Alchimisterey:<normalisation>xml:lang="de">Alchemie:</normalisation></transcription>
  </motto>
  <picture xml:id="E000944_P1">
    <iconclass rdf:about="http://www.iconclass.org/rkd/31A247">
      <skos:notation>31A247</skos:notation>
      <skos:prefLabel>looking over the shoulder</skos:prefLabel>
    </iconclass>
    ...
  </picture>
</emblem>
</biblioDesc>

```

Figure2: SPINE metadata record has granular levels of descriptions for a book and emblems contained in the book titled, *XL [i.e. Quadraginta] Emblemata Miscella Nova*

References

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