

# The Role of Standards in Creating Community

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## ABSTRACT

Participation in the web of communities requires a common language, a common technological structure and development of content that is relevant and captivating. This paper reports on a project that both conserves a rich regional cultural heritage and has structured the content developed during this conservation to be fluidly shared with both the domain and the broader communities. It also examines the varied degrees of acceptance within these communities.

## Categories and Subject Descriptors

*I.2.2 Designer, C.2.1 Internet, D.2.2 JSP, D.3.2 Java, H.2.3 SQL, I.7.2 XML*

## General Terms

Design, Languages, Standardization, .

## Keywords

Open Archive Initiative, Museums Online Archive California, Semantic Web, Historic Costume Collection, Ontology, Thesaurus, XML, Dublin Core

## 1. INTRODUCTION

As university budgets are tightening, many university programs are looking for innovative ways to access and utilize their cultural holdings. Digitization of these holdings creates multiple opportunities for sharing them with a broad community and creating some unique educational tools. The Drexel Digital Museum Project: Historic Costume Collection, is a collaboration between the College of Media Arts and Design and the College of Information Science and Technology, Drexel University, which uses current technology, traditional design skills and historical perspective to create access to and to preserve and manage the objects which comprise the collections of the Drexel Museum

The project provides access to the rich collections of the Drexel Museum via an online searchable database, with high quality digital representations, from multiple views. An evolutionary prototype has been created for this museum online. <http://digimuse.cis.drexel.edu> The quality of the graphic images, rich detail, and multiple views, via the 3D panoramas on the prototype website, are unique among historic costume collection websites. This paper reports on how data and image standards have been incorporated to increase access to the Collection and to gain inclusion in a variety of communities.

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Figure one: Evening gown, designer not known, Drexel Historic Costume Collection

## 2. LANGUAGE

Archiving historic costume and fashion for electronic media presents two language challenges: incorporating established prime source vocabularies for fashion and costume into one thesaurus that is sensible to both communities; and implementing a technological structure that classifies these terms and defines their relationships in a scheme that can be processed by an electronic application.

### 2.1 Language for Humans

As determined by user analysis early in the design of the system [1], our user groups include scholars (costume historians, archivists and design faculty), students and fashion designers. The terminology used by these numerous user groups to describe a garment's category varies from group to group. There was a need to find a common terminology that could be used for both data entry and data

retrieval among the user groups, removing the communication barriers inherent in the varied terminology of the two communities. As a Department of Design that has custodianship of a Historic Costume Collection used as a teaching Collection we straddle the worlds of the Historic Costume scholars and contemporary fashion design and felt competent to tackle this job.

To accomplish this, a thesaurus is being developed which marries the International Council of Museum's, (ICOM), hierarchy of costume terms, which identify a historic costume's category by where it falls on the body, to contemporary fashion and historic costume terms for category. These terms were gathered from the Core Categories for Visual Resources (VRA Core), The Getty Art and Architecture Thesaurus (AAT), Pickens Dictionary of Fashion, and Women's Wear Daily. A branch of the "Category" thesaurus, "Women's Garments>Main Garments" has been fully developed to be used as a model for all branches of the "Category" thesaurus in later development. The thesaurus is included in the data entry screen as a tool for determining category. When fully created the record shows the entire hierarchy of the category choice.

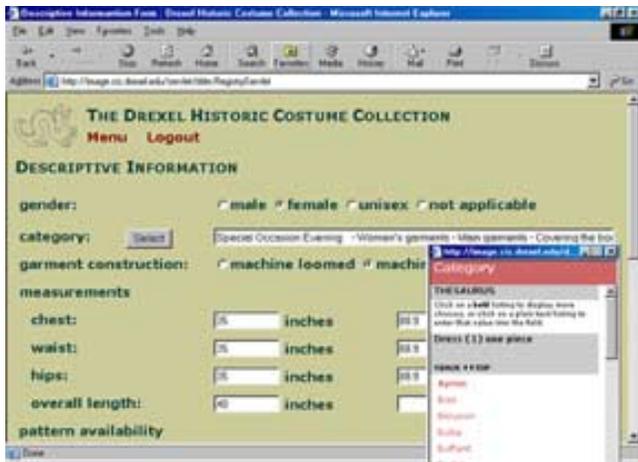


Figure 2: The thesaurus on the data entry screen

AAT, a well recognized prime source for vocabulary, at that time in our project development (1999) was not developed enough to include much in the way of fashion terminology. There were terms for historic costume such as "cod piece" (our collection has none) but "hot pants" (we have several) did not appear.

A recent visit to the online AAT did return "hot pants" on a search, complete with the thesaurus hierarchy which takes us, interestingly, to "Furnishings and Equipment" at the highest level of the hierarchy. However a search for "bandeau", a fashion term for a strapless top that has been in use since the 1970's, returned "bandeaux" with the definition of headband.

This illustrates one of the complexities of thesaurus building – how to deal with synonyms for a term that are at the same level of granularity as that term. We are in the process of mapping the synonyms to the appropriate term. This is also useful in determining what terms for category to use on the search interface of the Website. The drop lists there provide a basic search capability with the option of multiple criteria. In the Category drop list terms that are most common to all user groups are displayed. These terms are mapped to the full thesaurus to provide the best matches to the broader term. As the amount of images in the database increases, we will add an advanced keyword search.

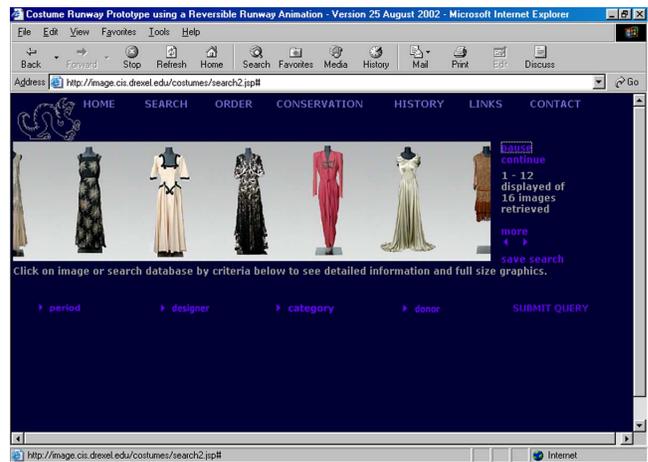


Figure 3: The search screen

To keep the thesaurus evolving and growing we are developing an online thesaurus building tool. Recognized scholars of fashion and historic costume will be invited to submit terms to be added to the thesaurus, engaging those communities in creating common terminology. We will also be developing thesaurus for textile construction, embellishment, finish and fiber content. This will allow the textile designer and scholar to search our database by these criteria and increase the breadth of the community we serve.

### 3. STANDARDS

Metadata is data about the data contained in a record, in plain text files, easily read by a variety of software for a variety of collections. Data structures are defined in "markup" languages. HyperText Markup Language (HTML), used on the world wide web, is limited to tags specified in HTML standards and is used mainly for defining how data should look on a web screen. Extensible Markup Language (XML) provides rules by which communities from various domains may transport data over the world wide web. This extensibility allows communities to create their own sets of tags. Using agreed upon protocols for the tags allows for the harvesting of metadata by a variety of browsers.[2]

"The Open Archives Initiative develops and promotes interoperability standards that aim to facilitate the efficient dissemination of content." <http://www.openarchives.org/organization/index.html> The tags for the OAI Metadata Harvesting Protocol are divided into three sections: protocol support; format – specific metadata; and community – specific record data. Although begun as "an effort to enhance access to e-print archives as a means of increasing the availability of scholarly communication", the independence of the technological framework and standards has expanded the scope of the initiative to include digital collections of images and multimedia.

With the broad dissemination of our content one of the goals of our project, we embraced this initiative after taking the CIMI workshop at the Museum Computer Network's 2001 annual conference.[3] Since the sets or collection definitions are not defined by the Open Archive Initiative (OAI) protocol but are defined by the communities of the data providers, we hoped to develop these definitions and, in turn, to be included in the greater museum and research communities through the fluid sharing of information OAI can enable.

A scroll through the Experimental OAI Registry at the Grainger Engineering Library at University of Illinois at Urbana-Champaign,

<http://gita.grainger.uiuc.edu/registry/ListAllAllRepos.asp>, reveals no Collections or Museums of Historic Costume or Textile as participants. Although there has been quite an impressive response from the science and library communities and various eThesis, ePublication and ePrint initiatives, the museum/collection community has been slower to participate. There are some recognizable exceptions in solely digital collections such as the Open Video project at the University of North Carolina in Chapel Hill, [www.open-video.org](http://www.open-video.org), and the Informedia project at Carnegie Mellon, <http://www.informedia.cs.cmu.edu/>, initiatives whose goals are “to create a publicly accessible digital video repository for educators and Researchers., develop and evaluate interfaces for digital libraries and develop open source digital library tools.[4] Collections of digital images, such as the ALA Archives of the Digital Imaging and Media Technology Initiative of the Library of the University of Illinois, the icdlPicture Archive, and ARCHEMEDIA.fr, are collections of scanned images of photographs or other works of art. PARADISEC (Pacific And Regional Archive for Digital Sources in Endangered Cultures) offers a “ facility for digital conservation and access for endangered ethnographic materials from the Pacific region, defined broadly to include Oceania and East and Southeast Asia”. (<http://gita.grainger.uiuc.edu/registry/details.asp?id=578>) Although our distinct community differs from that of PARADISEC, we share the community of institutions devoted to preservation of cultural heritage.

XML is a key standard in publishing metadata for the web. Markup can be a resource heavy process. Heflin and Hendler suggest that the mark up be done at the design phase of the website.[5] Since we were lucky enough not inherit a legacy system, the scope of our project included designing an archiving system from the bottom up and to build upon whatever data structures would provide the broadest access to our collection. We have redesigned our archiving system to be Dublin Core compliant and have created OAI metadata protocol definitions to serve the Historic Costume community. When full information screens, complete with embedded QTVR panoramas of the garments, are accessed from the search screen of our website, OAI compliant records are generated on the fly for the object.

```
<?xml version="1.0" encoding="UTF-8" ?>
- < GetRecord>
- < record>
- <header>
  <identifier>oai:drexel:ddm/60_Unknown12</i>identifier>
  <datestamp>2003-11-16</datestamp>
  <setSpec>ddm</setSpec>
</header>
- <metadata>
- <oai_dc:dc xmlns:oai_dc="http://www.openarchives.org/
  OAI/2.0/oai_dc/" xmlns:dc="http://purl.org/dc/
  elements/1.1/" xmlns:xsi="http://www.w3.org/2001/
  XMLSchema-instance" xsi:schemaLocation="http://
  www.openarchives.org/OAI/2.0/
  oai_dc/ http://www.openarchives.org/OAI/2.0/
  oai_dc.xsd">
  < dc:title>The 30s--special occasion evening</dc:title>
  <dc.creator>Unknown</dc.creator>
```

```
<dc:subject>women's garments--main garments--covering
  the body above and below the waist--dress (1) one
  piece--special occasion evening</dc:subject>
< dc:description>Archival Data : Unknown12</dc:description>
< dc:description>Category : special occasion evening
  </dc:description>
< dc:description>Country of Origin : Unknown</dc:description>
< dc:description>Designer : Unknown</dc:description>
< dc:description>Period : The 30s</dc:description>
< dc:description>Textile : Woven</dc:description>
< dc:description>Fiber Content : Silk</dc:description>
< dc:description>Note : Iridescent cross woven salmon pink
  and golden yellow taffeta. Long evening gown with
  trained skirt. Intricate draped pieces added to back and front of
  skirt and neckline. Heavy weights inserted to hold draping in
  place at neck, draping details and hem. Gown is sleeveless, with
  a dropped waist and fitted bodice.</dc:description>
<dc:description>Embellishment: Not Classified</dc:description>
< dc:date>1935</dc:date>
</oai_dc:dc>
</metadata>
</record>
</GetRecord>
```

Figure 4: Sample OAI metadata

To date, we have 90 QTVR panoramas of garments accessible from our search screen and another 40 garments digitally photographed, awaiting creation of their QTVR files. When these last 40 images have been loaded onto the site, a relatively small list of records compared to other providers, we will register as an OAI data provider with the Experimental OAI Repository and, become part of this Open Resource community.

## 4. LANGUAGE FOR MACHINES

Thesaurus building creates interrelations and associations between terms within our domain of fashion and historic costume. OAI compliancy allows data about the content of our records to be quickly recognized by a Web browser because of the standard employed. What other structures can we use to transfer the knowledge of the fashion thesaurus and its function in accessing our database to other domains?

Since 1998, Tim Berners-Lee, recognizing that most information on the Web is designed for human consumption, has been advocating the Semantic Web as a way “to form a consistnt (sic) logical web of data” and a “language for expressing information in a machine processable form”. [6] In his oft cited 2001 article in Scientific American, he outlines the requirements as needing to “provide a language that expresses both the data and the rules for reasoning about the data and that allows rules from any existing knowledge system to be exported onto the Web” and envisions “a web of machine readable data that allows software agents to relieve humans of the task of accessing the knowledge they seek through the Semantic Web. It must insure the interoperability of Web resources “ [7]

Ontologies, composed of a taxonomy which defines the classes of objects and the relations among them and inference rules, allow a program to make deductions about the information and manipulate

it in a way that is understandable to a human. There are several initiatives working on developing a language to extend the semantic reach of current XML and RDF meta-data efforts. The W3C has a Web Ontology Working Group. <http://www.w3.org/2001/sw/WebOnt/> The cultural heritage community stresses the need to clarify the meaning of the controlled vocabulary of a domain by referencing other more basic terms with universal meaning. Nicola Guarino senior researcher at the Institute for Cognitive Science and Technologies, Laboratory for Applied Ontologies calls these “Foundation Ontologies”, explicit and unambiguous descriptions of concepts of a particular domain. [8]

CULTOS, Cultural Units of Learning – Tools and Services, CULTOS, co-funded by the European Commission under the IST Programme (Information Society Technologies), is developing a knowledge-enhanced multimedia authoring tool for the domain of Arts and Literature. <http://www.cultos.org/index.html> The controlled vocabulary of their Intertextual Studies Ontology maps intertextual relations and creates a bridge between the domain and the greater community. Their intention is to keep the model flexible enough to overcome theoretical differences between academics in the cultural heritage field, much like our Thesaurus building tool will do for our development of domain terminology. “We can indeed build a very comprehensive, tangible model of intertextual studies, that is even stable in most aspects, but on the other hand, the domain cannot - more or less by definition of its agenda - be described by a finite model. Therefore, one of the interesting and technically challenging themes for further research will be to combine the stability of the existing ontology with possibilities for evolution by other experts working in subfields that require a more sophisticated vocabulary of ontological terms.” The very nature of this research creates community.[9]

Two of our prime sources for terminology for our thesaurus are involved in this process of extensibility. ICOM/CIDOC Documentation Standards Group is developing a “common and extensible semantic framework to which any cultural heritage information can be mapped” <http://www.willpowerinfo.myby.co.uk/cidoc/> There will soon be new releases of the AAT as relational tables, XML and MARC [http://www.getty.edu/research/conducting\\_research/vocabularies/download.html](http://www.getty.edu/research/conducting_research/vocabularies/download.html)

## 5. CONTENT

We initiated the project with an elicitation of user requirements from students, scholars and designers of Fashion and Historic Costume. Prime requirements across the user groups were quality images of multiple views and details of the garments and the ability to search an online database by multiple criteria. We decided that Quick Time Virtual Reality panoramas, incorporating details of the garments, were the best way to deliver the image requirements.

Since part of our charge was to archive the collection, the images we captured needed to be of collections quality as well as provide quality web display.

We follow the Museum Online Archive California (MOAC) approved Technical Specifications for submissions of images to the Online Archive of California which offers the guidelines for refining our image data by creating digital images that can be re-purposed across print, fixed and network media. <http://www.bampfa.berkeley.edu/moac/moacfullspecs.html>



**Figure 5: Evening gown, designer not known, Drexel Historic Costume Collection**

The specifications dictate that: all thumbnails should be 150 pixels along the longest edge; all derivative files should be in JPEG (Joint Photographic Experts Group) or GIF (Graphics Interchange Format); master files should be in TIFF (Tagged Image File Format) and 3000 pixels along the shortest edge. TIFF is a lossless file format which contains metadata in the “tag” with information about the image. As we began the digital photography process, we realized we had underestimated the time and resources needed to capture the quality images we required. Rather than compromise the quality of the image, we decided to reduce the intended amount of full image sets. These image sets are quite extensive and include MOAC TIFF files for 18 views of each garment, 8 to 25 detail shots of the garment and an image which includes a color calibration strip.

The quantity of the details and views has allowed us to create quite extensive digital galleries of exhibitions of costume in the Pearlstein Gallery of CoMAD. The Chinese Robe digital gallery, [http://digimuse.cis.drexel.edu/gallery\\_index.htm](http://digimuse.cis.drexel.edu/gallery_index.htm), contains 90 high quality images and detailed information on the design, iconography and construction of the objects as well as some history of the Qing Dynasty and a bibliography.



**Figure 6: Detail, Purse, Qing Dynasty, Digital Gallery**

Rich details of embroidery techniques and motifs provide an illustrated guide to creating this type of embellishment.

The digital galleries afford student, scholar and designer an image rich resource for the study of garment and textile design and construction, and the context within which these objects were designed. The search by browsing or multiple criteria function on the search screen provides access to all the images and archival data in the database. Garments of historic significance, but too fragile to mount on a mannequin for photography, have been photographed flat and are displayed on the “Conservation” screen, <http://digimuse.cis.drexel.edu/consobs/index.jsp>

## 6. COMMUNITY

So how has this quest for the common language, implementation of standards, and striving for quality content placed us in a community and how has the community responded?

The “Conservation” screen has drawn funds for conservation of several of our historically significant garments displayed on that screen. Valerie Steele, Chief Curator of The Museum at the Fashion Institute of New York has used the website to search our collection for potential garments to be included in a future show, “Fashioning the Modern Woman” in their gallery. Jack Lenor Larsen, world renowned textile designer and author of many books about design, remarks “the sensible, sensitive resolution of this project is a superb design and, perhaps, an art form – both a complex and effective means of communication and in itself an education. Working with this system will also set a new standard of elegance for our time”, in his evaluation of the project for a recent grant. Our “Mystery” screen features garments about which we have very little information and invites viewers to contact us with their input.

Funding for the project by foundations interested in preserving cultural heritage has been generous, including \$171,800 from the Barra Foundation and \$50,000 from the William B. Dietrich Foundation, as well as from independent benefactors. A proposal to archive the collections of Donna Karan Inc., adopting the design, architecture and data structure of the project, was solicited by the CIO from the project Director. Although funding could not immediately be made available, Carol Knouse, CIO for the company, noted in an email that “Everyone agreed that your solution would be ideal for Donna Karan.” The Director has been consulting with Musée de la Mode de la Ville de Paris on a proposal to license our system to archive their fashion collections. We appear to be included in the communities of benefactors and commerce.

An unplanned extension of the digital collection has evolved. Two private collectors have allowed us to digitally photograph garments from their collections while they retain ownership of the actual garments. Our physical collection is cramped for space, as are collections in many urban campuses, and our conservation funds limited. Creating virtual only collections allows us to include these design noteworthy garments in the digital collection without having to bear the responsibility of custodianship of the garments. It also affords the collector the ability to show part of their collection to anyone with internet access, anytime, from anywhere in the world. We are considering offering this as a service to small collections without the resources to create and maintain their own online searchable databases. Their images and archival data would be included in our database, accessed by password by them for insertion of records and images. We could create screen display design customized to their collection’s branding. Is this our Open Access community?

A measure of community on websites is their links to other websites and other resources. In spite of the Director’s presentations of the project to a wide variety of conferences – Costume Society of America, International Textile and Apparel Association, Museum Computer Network, Museums on the Web and the W3C - we appear as a link on only one historic costume website, La Couturière Parisienne, <http://www.marquise.de/> We do appear on several website portals for online museums.

Perplexed by this, an overview of websites for Historic Costume and Textiles was undertaken to determine which promoted community by links. Search capability and image quality were also noted. Of the 25 websites reviewed, 9 have links to other websites, 5 have links to other resources, and 8 have searchable databases. Two websites have very high quality images in a searchable database: The Texas Fashion Collection with 300 images, viewable from four views, with one zoom on each view and no details; and The Costume Institute of the Metropolitan Museum of Art, with 50 images, no details. Both of these sites have extensive links to other websites and resources. Neither have the continuous QTVR panoramas of the garments that we have on our Website. Interestingly, on Google searches for “Historic Costume” or “Historic Costume Collection” neither of these excellent Websites show up on the first ten screens.



**Figure 7: Evening gown and jacket, Digital Gallery, from the collection of Iris Barrel Apfel**

We have created a list of links on our Website to fifteen Websites which represent Historic Costume Collections. These links extend the assets of the online Collection to include those of other Collections, insinuating community.

## 7. CONCLUSION

We have implemented a variety of strategies to engage as broad a community as possible:

- Developing a thesaurus for common language between the fashion and historic costume communities
- Adopting data standards that expedite sharing of data across many domains
- Adopting image standards that insure the best possible display of those images
- Creating online galleries of exhibitions which can be used as educational tools
- Linking to other online Collections from our website to build community

These strategies have not been without problems. By adopting collections quality image standards we slow down the digitization process. We projected two hundred full images sets for phase one of

the digitization and have only finished one hundred and forty. OAI-MHP, once implemented, requires no extra resources in record creation. We have yet to see what significance our small amount of records will have in a trusted digital repository.

One of Webster's definitions for community is: "an interactive population of various kinds of individuals in a common location." The open discussion and exchange of information among the cultural heritage and technical communities regarding advancement of technologies designed to enable knowledge sharing and reuse has created a community in the common location of the World Wide Web. By adopting the data and image standards being created in this community we participate in the community. By making the thesaurus available to editing by historic costume scholars we set a common standard for language. with our domain community.

As we use the Website within our university as a teaching tool and encourage other Fashion Design schools to do the same we connect with a young and growing audience, our community of the future.

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