HISTORIC COSTUME COLLECTIONS IN THE DIGITAL AGE

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ABSTRACT

Historic costume has long been an inspiration for contemporary fashion designers. Publications and visits to the collections of museums and universities provide traditional access to these historic objects. Distance from collections and libraries limits accessibility for many designers and scholars. This paper describes an online digital museum of historic costume, replete with high quality images of the objects from multiple views, details of embellishment and construction, multiple search criteria to the database and online galleries of exhibitions of historic costume. The project is an interdisciplinary collaboration between the Antoinette Westphal College of Media Arts & Design (AWCoMAD) and the College of Information Science (IST), Drexel University, and can be viewed at http://digimuse.cis.drexel.edu

The website is freely accessible to anyone with an internet connection from anywhere in the world, creating unlimited access to a small, world class teaching collection. It is meant to be used as an educational tool by designers, scholars, students and aficionados of fashion design. The best practice standards of the Museum Online Archive California http://www.bampfa.berkeley.edu/moac/classic/bpg.html and the Open Archive Initiative http://www.openarchives.org/ have been implemented into the project to insure the best quality images, formatted for repurposing via a variety of media, and to provide a data structure that will allow fluid sharing of the objects' data among a variety of users.

1. INTRODUCTION

The Drexel Historic Costume Collection (DHCC) had its beginning in the 1890's when members of the family of the founder of Drexel University, Anthony J. Drexel, began assembling a collection of notable garments, accessories and textiles to be included in the Drexel Collection. The Drexel Collection was amassed by the founder from expositions of fine and applied arts around the world to be used as prototypes and inspiration for the students of what was then called the Drexel Institute of Arts, Science and Industry.

The collection represents over one hundred and thirty years of historic costume and textile design. It has grow, through donations from Philadelphia society, to represent every major designer of the 20th century such as Beene, Blass, Givenchy, St. Laurent, Norell, Dior, Chanel, Lanvin, de la Renta, Herrerra, Fortuny, Poirot, Vionnet, including fifteen gowns from the House of Charles Worth, considered the father of couture. The collection is estimated to contain approximately 7000 garments. There is also an extensive lace collection. Shoes, millinery, parasols, gloves, and other accessories in the collection present an opportunity to study an entire period ensemble. During a recent visit to the Collection, Fabienne Falluel, head curator of the Musée de la Mode in Paris, proclaimed "c'est magnifque!"

Figure 1. Evening gown by Charles Worth, c.1885;
Evening Gown by Charles James, c. 1955

Documentation for the Collection consisted of 3”x5” index cards with three different object identification systems created over the years by a variety of curators. As CAD specialist to the Fashion Design Program, the author was given the assignment to create a database to manage the Collection. Research into classification systems for historic costume, some incorporating the internet, led to the decision to create an online database, searchable by multiple criteria and displaying quality images and The Drexel Digital Museum Project: Historic Costume Collection was begun.

Figure 2. Splash screen, Drexel Digital Museum Project

2. GOALS

The DHCC is primarily a teaching collection with many of the garments collected for the intrinsic value of their design. Faculty and students use the Collection to learn details of construction, embellishment, and elements of design. Lack of a full time curator and proper exhibition space limit access to the Collection. Funds for conservation are scarce and many of the garments are in fragile condition. The very basic goals of the Drexel Digital Museum Project: Historic Costume Collection have been to create access to the cultural assets of the University by creating a uniform, electronic archiving system for the museum's assets; and to conserve the objects by creating digital surrogates for them that will withstand the ravages of time and lack of conservation funding currently available for the physical objects in the collection.

The project is in collaboration between AWCoMAD and IST and uses current technology, traditional design skills and historical perspective to create access to, and to conserve and manage the objects which comprise the Drexel Collection. The goals of the project are to:

- Allow broader public access to Drexel's unique collections
- Provide tools that enable more effective scholarship
- Offer research opportunities within the collection on a global scale
- Train students in digital image management and museum informatics
- Protect the University's assets
- Acquire funding to achieve sustainability

3. METHODOLOGY AND STANDARDS

Our target user groups, established early in the project by survey, observation and interview, are students and scholars of fashion design and historic costume, fashion and textile designers, and devotees of historic costume and fashion design. We discovered that what all the users wanted most from this site were high quality images, multiple views and details of the objects in the collection; and multiple ways to create parameters for their online search.

3.1. Preparation and Processing of Material

The curator has twenty two years of experience with the Collection. She makes the selection of which garments are the most significant in terms of design and if the garment is sturdy enough to be mounted on a mannequin to be digitized. Following the International Committee of Museums (ICOM) guidelines for conservation, she and her assistant clean and press the garment and stabilize if necessary, before mounting on the mannequin.

The ICOM guidelines for photographing historic costume are adhered to for the digital imaging used in this project. Although they are written for digital masters produced by scanning rather than digital photography, the Digital Library Federation guidelines have been referenced as a framework for quality image capture. We follow the Museum Online Archive California (MOAC) approved Technical Specifications for submissions of images to the Online Archive of California which offer 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.berkely.edu/moac/moacfullspecs.html

The MOAC 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 uncompressed TIFF (Tagged Image File Format) and 3000 pixels along the longest edge. TIFF is a lossless file format which contains metadata in the ”tag” with information about the image which helps insure the file will be able to be opened in the future.

The archival files are stored on CD-ROM as raw images, with no manipulations of the file in PhotoShop or other image enhancing applications. One file includes a color calibration chart for color matching and a measurement scale. The auxiliary files, the QTVR’s and thumbnails created for the web, are stored with the actions applied to them to make them web ready on CD-ROM.

3.2. Organization of and Access to Material

The database for the system is relational, with tables created from the classes, relationships, and instances necessary to deliver the functions of an information system that will manage both the physical collection and its digital counterpart.

3.2.1. Online Thesaurus

The terminology used by our diverse 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. To accomplish this, a thesaurus is being developed which marries the ICOM hierarchy of costume terms, which identify a historic costume’s category by where it falls on the body, to contemporary fashion and Pickens historic costume terms for category. This hybridization is to enable ease of data entry and retrieval by a variety of domain expertise. The thesaurus is accessible during data entry and will map to search criteria on the World Wide Website.

3.2.2. Metadata

We have made our website and our database comply with the application-independent interoperability framework defined by the Open Archive Initiative (OAI). http://www.openarchives.org/ There are at least three incentives for us to do that. First, the framework provides an excellent guideline for implementing metadata for our collections. The twelve elements of the Dublin Core comprise the source model for OAI by defining core data elements necessary for archiving objects. Secondly, by creating OAI-PMH compatible metadata records, we are opening up our resource to OAI service providers and potentially reaching more audiences through them. Thirdly, the interoperability of the framework will help us achieve the goal of making our system portable and extendible.

The adaptation of the OAI protocols is not a simple and straight forward process, however. Our collection consists mainly of historic costumes. Dublin Core (DC), which originates from document descriptions, is the metadata format required by OAI.

How do we map document metadata formats to costumes? For example, what is the title for a garment? At first, we simply used Category of garment as the title. We soon found that such a title is far from a good representation of the garment, and it is not unique, particularly when the size of collection grows significantly. We then added Period to the title as it is an important piece of information for historical costumes. Finally, we found the designer is also an important characteristic that need to be reflected in the title, we added it to the title also. Thus, the title of a historical costume can be automatically generated from our database by the following formula:

Title = Period + Category + Designer

Such as:

"New Look Special Occasion Day Dress by Norman Norell",
"Avant Garde Fashion Special Occasion Evening Dress by Hubert Givenchy,"
"Eclectic Fashion Suit by Chanel."

These titles create rich metadata that describes key elements of historical costume.

The second major decision on the metadata implementation is what to include in the subject field. We assign a term from the thesaurus to each costume as the category of the costume; the term is used in the title field. We then decide that we should include all the terms in the upper hierarchy of the term in the subject field. For example, for the category "Special Occasion Day," we put "Women's garments -- Main garments – Dress, One piece – Special Occasion Day" in the subject field. The string represents all the terms in the upper hierarchy of "Special Occasion Day", except a group term, "Covering the body above and below the waist" (The group terms are used in the thesaurus to group terms and create consistent hierarchies. They are not considered as subject terms). Such a subject field turns out to be very useful for the purpose of indexing and searching.

Some other fields of the database are mapped to DC elements as well. Once all the mapping rules were defined, we implemented the rules in a Java servlet, OAI-Servlet. The OAI-Servlet is a full implementation of OAI Metadata Harvesting Protocol, supporting queries such as "GetRecord," "ListRecords," "ListSet," "ListIdentifier," etc. To be consistent with the museum community's implementation of OAI, we implement the APIs from the Consortium In Museum Intelligence (CIMI) Metadata Harvesting Working Group. The APIs greatly facilitated our implementation of OAI protocol. Metadata that follows the OAI standard is created on the fly for each record as it is retrieved from the database.

Figure 3. A sample OAI metadata record automatically generated from the database

```
<?xml version="1.0" encoding="UTF-8"?>
  <GetRecord>
    <record>
    <header>
          <identifier>oai:drexel:ddm/23_NormanNorell01 </identifier>
          <datestamp>2002-02-28</datestamp>
          <setSpec> ddm </setSpec>        // Drexel Digital Museum
          <setSpec> hcc </setSpec>        // Historical Costume Collection
    </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> New Look Special Occasion Day by Norman Norell </dc:title>
          <dc:creator> Norman Norell </dc:creator>
          <dc:subject> Women's garments -- Main garments – Dress, one piece --
Special  Occasion Day  </dc:subject>
          <dc:description>Country of Origin: USA <dc:description>
          <dc:description> Halter top evening dress. Black wool bodice. White organza
        skirt. Attached crinoline underskirt. Red silk rose at waist </dc:description>
            <dc:description>Includes a 3-D panorama Quicktime movie:
                        http://digimuse.cis.drexel.edu/images/NormanNorel01_a.mov
          </dc:description>
           <dc:date> 0 </dc:date>
        </oai_dc:dc>
     </metadata>
   </record>
</GetRecord>
```

3.2.3. Compatibility

The tools we have used in developing the project match the portable technologies used in the reference implementation developed by CIMI for MOAC:

- Java 2 Standard Edition 1.3
- Java 2 Enterprise Edition 1.2(JNDI and JDBC)
- MySQL using the mm.mysql JDBC driver
- Java Servlets AP! 2.0
- Java API for XML Processing (JAXP) 1.1

If a user does not have the QTVR plug-in required to play those movies, they are prompted to the Apple website for a free download. The website has been optimized for Mac and PC platforms, Internet Explorer and Navigator browsers.

The amount and the file size of the images on the website make downloading through a dial up connection to the internet a slow process. The recommended broadband connection is becoming more evident in our user group as they trade their dial up for cable or DSL. Most universities and museums now have broadband connections. We plan to convert the retrieval process on the “Search” screen to a Java application which should make the download faster.

3.3. Storage, Maintenance, and Protection of Data

The archival files are stored on CD-ROM as raw images, with no manipulations of the file in PhotoShop or other image enhancing applications. One file includes a color calibration chart for color matching and a measurement scale in inches and metric, placed next to the object in the image, 600 dpi, 24-bit, RGB, color corrected to MOAC image standards, and saved as an uncompressed TIFF file. TIFF is a lossless file format which contains metadata in the ”tag” with information about the image which helps insure the file will be able to be opened in the future. It is an archiving standard for both the museum community and the fashion industry.

The auxiliary files, the QTVR's and thumbnails created for the web and the PhotoShop files used to create them, are stored with the actions applied to them to make them web ready on a separate CD-ROM. Currently, these and the archival files are stored on two sets of CD-ROMs, one stored in the documentation studio and one stored in the Director's office. In this next phase of digitization, at the recommendation of an evaluator on a previous grant, the files will also be stored on a server housed in IST and maintained by Dr. Xia Lin, the Associate Director of the project, and accessible only by password.

The standards based, best practices design of the information system help to insure that the data created will be accessible via available future technology. The iterative design process of evolutionary prototyping also allows the developers to revisit data and image standards to insure sustainability of the system. AWCoMAD has granted financial support at the genesis of the project and has provided continuous release time for the Director to manage the project. Both colleges have made space and technology available to the project and enjoy the profile the project brings to them and the University through the many presentations and papers produced by the directors.

Intellectual property rights are protected by a contract with the photographer and a right of release form from the donor, both composed by the legal staff of the University. The "Home" screen informs the viewer that all images appearing on the website are protected by copyright and gives them an email link to contact us for a right of release for any images they may wish to reproduce for educational purposes.

3.4 - Work Plan

The curator of the physical collection, makes all choices of which objects in the physical collection are significant historically and/or excellent examples of design and thus candidates for the online collection. She works with the photographer to determine what construction and embellishment details will be captured. There is a Graduate Assistant assigned to her to help prepare these sometimes fragile garments for image capture, pressing, cleaning and stabilizing when necessary. They also mount them on special mannequins, collect and verify existing documentation and create detailed descriptions of the objects.

The photographer digitally images the garment, using MOAC standards, from eighteen views by centering the garment, which has been mounted onto a mannequin, onto a Kaidon rotating rig. The rig rotates twenty degrees with each revolution and the image is captured, lit by strobe lights synchronized to the camera. The photographer is responsible for naming the files according to our naming convention, creating the QTVR three-D panorama movies, and storing all files on the CD ROMS as described in the digitization specifications. He has a Graduate Assistant to help him in all aspects of this process except the imaging.

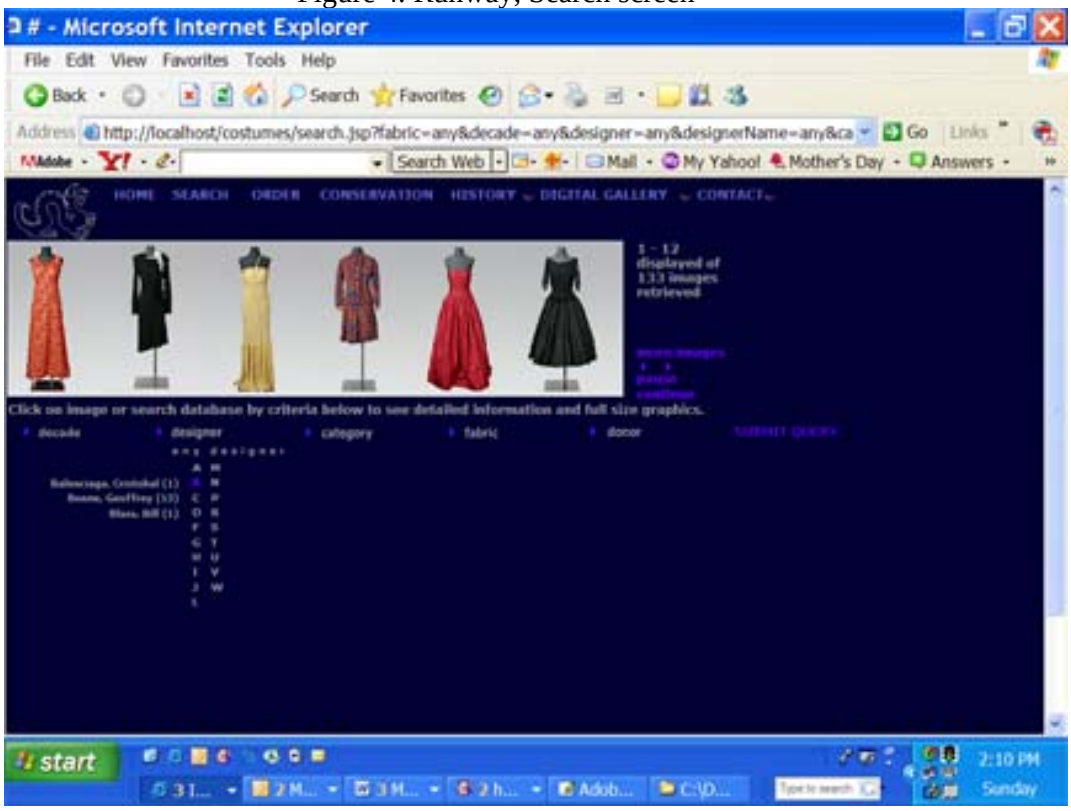
The image files are then sent to the Project Director who inspects them for quality and compliancy to the Project specifications, creates the thumbnails and loads the images into the developmental database, entering basic registry and descriptive data, and checking the display on the website. Detailed archival data is then entered into each record by the curator and her assistant. It is checked by the Project Director. When all

images and data are approved, the content of the public website is updated from the development website by the Associate Director and his Research Assistant.

4. DESIGN

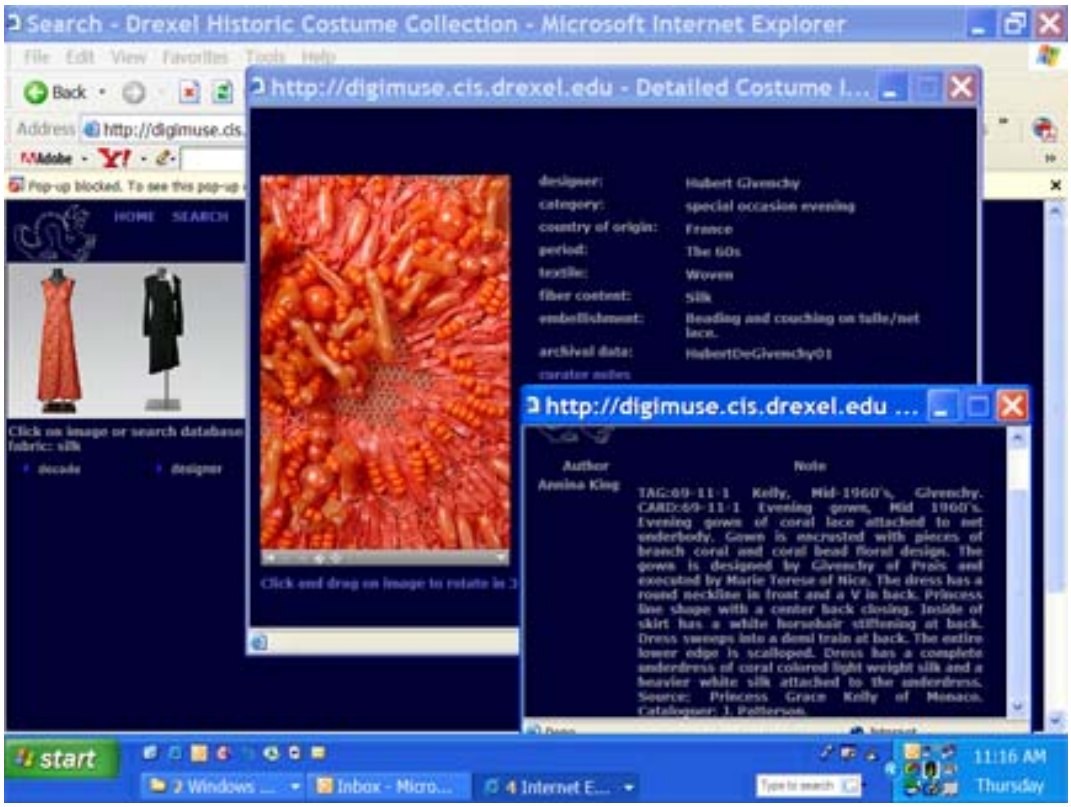
A unique feature of the design is the moving "runway" used to display thumbnails of objects in the database. When the viewer opens the "Search" screen, six thumbnails are displayed. They may choose to load all images from the database by clicking "more images". An additional six thumbnails load each time the viewer clicks on "more images" and the runway is set in motion, looping through the thumbnails. They viewer may pause, move the runway backward and forward, and continue their search via the commands under "more images".

Figure 4. Runway, Search screen



All the objects in the database may be loaded in this manner or the viewer may narrow their search by choosing single or multiple search criteria from the Decade, Designer, Category, Fabric and Donor drop lists below the runway. Clicking on the thumbnail takes the viewer to a full information screen which displays archival data and a Quick Time Virtual Reality (QTVR) movie of the garment. The viewer can use the curser to rotate the garment for a full panoramic presentation. Clicking on "hot spots" zooms in on details of construction and fabric.

Figure 5. Detail and descriptive notes of a gown by Hubert Givenchy, c. 1960, donated by Princess Grace Kelly



5. SUMMARY

Having high quality images and brief archival data online conserves the garments from undue handling and conserves the curator's time. A student or scholar can view parts of the Collection online and then request to see the actual garment. The website includes a screen for "Conservation" http://digimuse.cis.drexel.edu/consobs/index.jsp which describes our "Adopt a Costume" initiative. To date, three of the costumes on that screen have been adopted and conserved.

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 and, from the online searchable database, deliver rich information about the Drexel Collection to the viewer. A comparison study of other online collections reveals lesser quality images on websites giving the viewer an idea of what is in the collection's holdings but not the design detail our images deliver. Most websites present only front views of the garments. None of the other websites offer 3-D panoramas of the garments and the rich details we do.

The website has open access for anyone with an internet connection. Once a year, the Fashion Program curates a show of Fashion or Historic Costume in the Pearlstein Gallery at AWCoMAD. To extend the life of these exhibitions, garments in these shows are photographed and included in the database. The images and text are combined into digital galleries on the website which illustrate embellishment and construction techniques and can be used to enhance classroom instruction. http://digimuse.cis.drexel.edu/gallery_index.htm

Recently the Hagerty Library, Drexel University, has implemented a "Trusted Digital Repository" for OAI compliant archives. These archives will be shared with members of the ever growing, international OAI community. We are preparing our data to be included in this repository. The project has been included in the Artifact database, a free guide to the best of the Web for architecture, communications, media & culture, design, fashion & beauty, music & the performing arts and visual arts, based in the United Kingdom. http://www.artifact.ac.uk

Work on this project continues and additional sources for funding are constantly being sought. Our original estimates of the cost of human and financial resources were naive and low. However, the project continues to gain in reputation and audience and to slowly help us reach our goals.

5. REFERENCES

Cataloguing Cultural Objects: A Guide to Describing Cultural Works and Their Images, available at http://www.vraweb.org/ccoweb/index.html

Creating Digital Images, available at http://www.tasi.ac.uk/advice/creating/creating.html .

Guidelines for Costume, available at http://dept.kent.edu/museum/link/icom.html#lighting .

Hecker ,M., *Creating Digital Images*, available at http://www.luminous-landscape.com/tutorials/dq.shtml .

Lagoze, C., October 22 2001, *CIMI/MCN 2001 OAI Workshop*, Museum Computer Network Conference. Cincinnati, OH.

Perkins, J., October 22, 2001, *CIMI/MCN 2001 OAI Workshop,* Museum Computer Network Conference. Cincinnati, OH.

Stern, H., October,2001 *The CIMI OAI v1.0 Repository, A Reference Implementation of the OAI Metadata Harvesting Protocol*, CIMI/MCN 2001 OAI Workshop. Museum Computer Network Conference. Cincinnati, p.3.

Waibel, G., 1993, *MOAC Standards and Specifications*, available at http://www.bampfa.berkeley.edu/moac/classic/bpg.html2 .

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