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Miranda Howard

Western Michigan University, miranda.howard@wmich.edu

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Visual Resources, the Web, and Classroom Teaching: A Case Study of the Canterbury Cathedral Project at Western Michigan University

Miranda Haddock, Western Michigan University

"To design a digital artifact is to design an experience."¹

"...the computer media revolution affects all stages of communication, including acquisition, manipulation, storage, and distribution: it also effects of types of media – texts, still images moving images, sound, and spatial constructions."²

Introduction

This paper describes the development of a multi-media, Web-based teaching tool that includes virtual tours, a visual resources collection, and case studies of Christ Church Cathedral, Canterbury, England. In March, 2002 a collaborative project began entitled "Canterbury and Saint-Denis—An Interdisciplinary Online Approach to Two Churches at the Intersection of Medieval Culture." Key players in this project, funded by a Western Michigan University Faculty Senate Teaching, Learning, and Technology grant, were the author of this paper, the Visual Resources Librarian; Robert Berkhofer, Assistant Professor of History; Paul E. Szarmach and Elizabeth Teviotdale, Director and Assistant Director of the Medieval Institute, respectively; Michael VanPutten, Multimedia Programmer and Specialist; and two student assistants. The role of the visual resources librarian was to purchase images and rights from image vendors; to secure rights from the Dean of Canterbury Cathedral to photograph the cathedral and precinct; to oversee the student assistants as they processed and stored all images; and to put together and maintain the visual resources webpages of the site. The scholars' roles were to write the text for the site, create guided tours and case studies³ focusing on specific features of the cathedral, and to mount them onto the website. To date, the basic main tour and the explore-on-your-own features of Canterbury Cathedral and an online digital image library have been created.

Discussing the decision-making process, challenges, successes, and pitfalls of the project are important aspects of this paper. The majority of this discussion includes the picture processing and visual resources librarian's input into this project. Creating the project was as much a learning experience for the creators as the finished product was for students. The author's expectation is that this paper will serve as a tool for other visual resources professionals to learn from

and use in the planning of other collaborative digitization projects.

Objectives and Goals

The project team saw the opportunity to use what Lev Manovich refers to as "computer-mediated forms of production, distribution, and communication"⁴ to replicate the medieval experience of visiting a Gothic cathedral. Here is how the project is described in the original grant abstract:

The medieval church was simultaneously holy ground, a place of worship and pilgrimage, and a polemical representation of heaven. We want students to understand not only the physical viewpoint of medieval Europeans, but also their mental viewpoint. Students should understand that the physical journey though the cathedral was also a mental journey.⁵

The users of this product will be faculty and students of western civilization and medieval history classes. A major objective was to create a website that could be used for assignments in and out of the classroom. Since the majority of WMU undergraduates and some graduate students have never actually visited a Gothic cathedral, it is difficult for them to comprehend how and why the cathedral functioned as it did hundreds of years ago. Through images and text, this multi-media website could provide the necessary knowledge to understand the viewpoint of the medieval pilgrim as well as the material structure and architecture of the Gothic cathedral. The end product of this project would be a website with virtual tours, case studies of specific aspects of the art and architectural details, a digital image library containing images of the exterior and interior architecture and decorative arts, and floor plans of the cathedral for research and individual study. The virtual tours were designed to illustrate specific concepts of Gothic art and architecture, development of architectural elements, and unique features of each cathedral for undergraduate and graduate students of medieval studies. Through the website, students could actually learn to analyze the visual world of the Gothic.

Funding, Equipment, and Software

In winter 2002, the WMU Faculty Senate announced Teaching, Learning, and Technology grants of \$25,000 to faculty whose departments were willing to contribute an equal amount. Since three departments were collaborating on this project, each put up \$8,333 from their own budgets. The library made available funds from the Visual Resources Library acquisitions budget to purchase the initial collection of images from vendors and the use of a digitizing studio and computer workstation. The History Department and Medieval Institute matched funds for a student worker, travel to Canterbury, England and Paris, France, and the cost of software and a

digital camera. The grant funding covered the cost of the multi-media programmer, travel for the librarian to the cathedrals, and some equipment and software costs.

At the beginning of the project, equipment consisted of two computers (one Dell and one Mac), two Nikon 2000 slide scanners, two Jaz drives, two CD-writers, and one Umix flatbed scanner. Images were stored on one of the library's servers. After the first year, another Mac and CD-writer were added. We needed more storage space so we eventually went to CD-Rewritable disks.

Seven different software packages were needed to bring this project to the Web: Laser Ware's Silverfast 4, Adobe Photoshop 6, Microsoft Excel 2000, Extensis Portfolio 5, Macromedia Flash and Dreamweaver, and Web Merge. Slides from vendors⁶ were scanned using Silverfast 4, then processed in Photoshop 6. Metadata for the images was organized using Excel. Eventually, each participant in the project added images taken with a digital camera. These images were also processed using Photoshop 6. Each image was saved in two formats, an archival high-resolution TIFF and a Web-ready JPEG. As the number of images increased, Portfolio 5 was used to manage the images and metadata. Web Merge was another software package that had to be purchased so that images could be processed correctly for the visual resources webpages. Flash and Dreamweaver were used to create the webpage and allow the user to move through the tour.

Creating the Product

During the product development discussions it was decided that we would not use Quick Time VR for two reasons: the equipment was not owned by any of the participating departments nor was funding available to purchase the equipment or outsource the 360-degree photography. The decision to work with a large series of still images seemed sensible because still images could detail specific visual aspects of Canterbury Cathedral such as the pulpit, the grave of the Black Knight, the place of Thomas à Becket's death, the floor of Trinity Chapel in the chevet, and the typology windows. Still images could also be stitched together later to create an "in-the-round" tour and provide images for projection during lectures.

Slide images in 35mm format purchased from vendors were scanned using the Nikon 2000. As team members returned from abroad with more digital images, they were processed in Photoshop, then saved as an archival TIFF file on the library's server. The filename for each archival image was the accession number of the TIFF.

Information in the form of metadata was recorded for each image on a spreadsheet using Excel. The metadata included basic cataloging information such as interior, exterior, filename, date, title, geographic location, architect or artist, photo credit, etc. This information included the type of view—general, broad, standard, or detail; the area of the church—nave, presbytery, choir, transepts, etc.; the direction the

photographer was facing—N, S, E, W; and the elevation—a (aisle), b (triforium), and c (clerestory). Standard images were selected for the virtual tours. General, broad, and detail views would be used in case studies and on textural pages that were not part of the tours, but still integral to the website.

Using still images did present the first of many challenges, namely, how can the "spatial construction" Manovich mentions be created with still images?⁷ The team would have to find a method for projecting two-dimensional images onto the two-dimensional computer monitor to create a three-dimensional space. The solution presented itself in the form of a grid and an alphanumeric image naming system. By using the cathedral floor plan for the guided tours, a grid was superimposed onto the floor plan (Figure 1). This grid divided the floor plan neatly into small units or locations that could be easily identified by a four-digit number. This same concept was applied to the exterior of the church as well (Figure 2). Not only was this scheme an effective method for identifying the images, it was the key to placing the images into the floor plan for the virtual tour. This scheme not only facilitated the placement of images in the interface, it also served as a photographer's shooting guide as well.

Derivative Web-ready JPEG files had to be created from the archival images to be used in the interface. Here is how the system worked for Web-ready images. Images were divided into two large groups—interior and exterior. Within each group, each image was named with its area, location, direction, and elevation. Filenames for the JPEGs look like this:

nave_3010_n_a.jpg = nave from location 3010 of the grid looking north at aisle level

chevet_2030_e_b.jpg = chevet from location 2030 of the grid looking east at the triforium level

In the interface, the floor plan looks as it does in Figure 1. The software was programmed to read the image filename and place the image in the appropriate place to appear in the virtual tour during the site building process. This made it possible in the end product for each individual location of the floor plan to pop up when the mouse is passed over it. Users could then move from the floor plan into a detail by clicking the mouse. A click of the mouse brings up all the images for that location, thereby permitting the user a choice of images by elevation and direction.

Follow Up

In order to make sure the website was meeting the team's goals, peer reviews were arranged after the first and second years of the project. The team believed that this review process was important to the development of the product so that this virtual tour will not only be useful to the Western Michigan University community but will serve as a model for other cathedral projects for educators at other institutions.

After the first year of work, the team sought reviews from three educators who were experienced in the work of multi-media websites. These educators were Dawn Marie Hayes, Assistant Professor of History, Montclair State University; Martin Foyes, Assistant Professor of English, Hood College; and Allan Heaps, Center for Instructional Technology, Western Kentucky University. Each reviewer was asked to comment on several aspects of the interface. Their reviews were positive overall, especially about the objectives, but the reviewers did have several constructive comments.

Allan Heaps brought to our attention the ADA compliance issues in the layout/design and colors areas.⁸ He made several suggestions that facilitate the use of the site by those with visual impairments such as not using tables, increasing the contrast of the colors, and adding a "back" button in the interface rather than having the user rely on the browser feature to move back. ADA compliance was greatly improved by acting on these suggestions.

Dawn Marie Hayes and Martin Foys pointed out that the use of Quick Time VR (QTVR) would also improve the site. Hayes and Foys provided proposals of how QTRV could be incorporated into the project to make it appear less linear. Hayes stated, "QTVR would be a great way to give students the opportunity to easily modify their elevation and perspective and would provide for a less static and navigation-intensive experience."⁹ They also suggested ways to make the text and images work together more smoothly. Hayes also

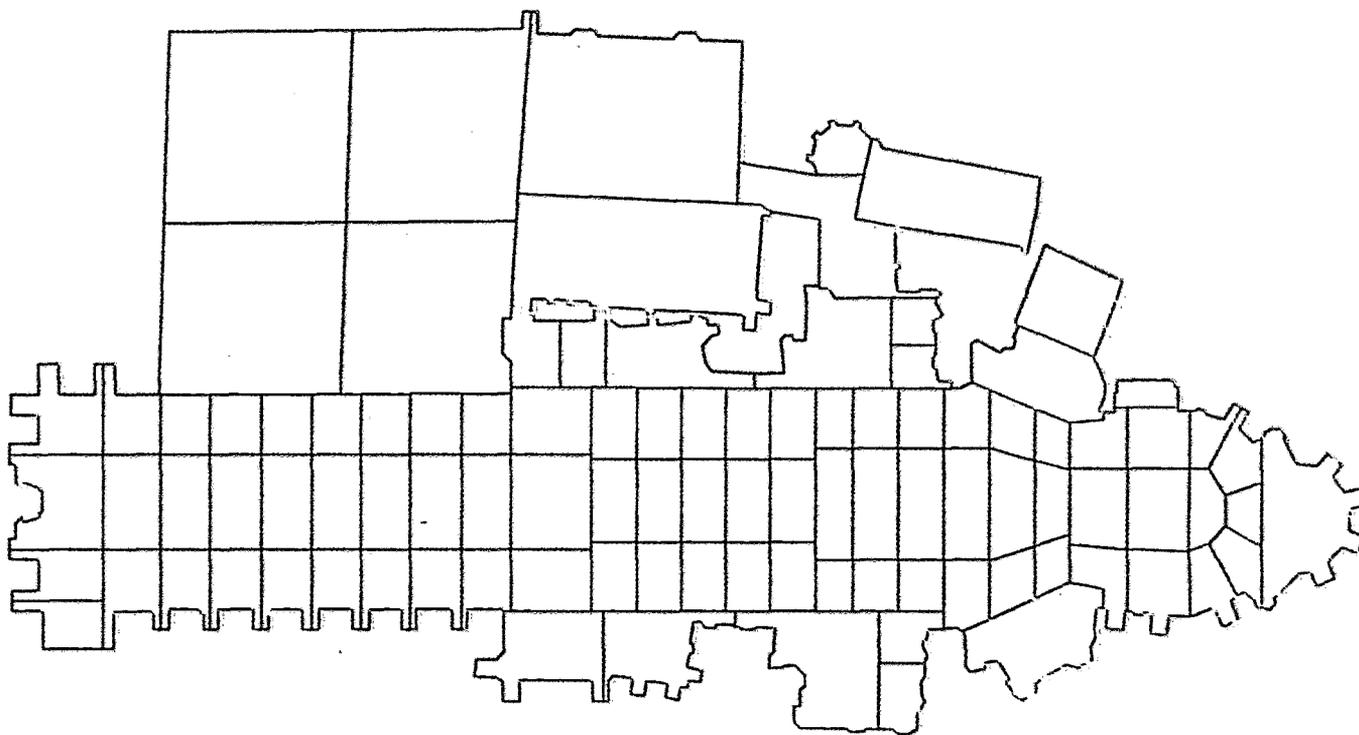
suggested the addition of a glossary of terms relating to the medieval cathedral.

As a result of the reviews, adjustments in the interface programming and design were made in some areas and a bibliography was added. A glossary of terms was created by one of the student assistants, but has not yet been added to the site. Quick Time VR, however, was not employed due to funding limitations. After the second year Hayes and Foys reviewed the product again at a session about the project at the 39th Medieval Congress held at Western Michigan University on May 6, 2004. Once again, the reviews were favorable and the reviewers also had some new ideas and suggestions. Foys thought it was not necessary to have so many locations in the floor plan. Having fewer locations would eliminate some images, reducing the number of shots with little or no relevant content.¹⁰ Of course, Quick Time VR again came up in the second round of reviews.

Growing Pains of a Digital Project

There were a number of stumbling blocks along the way. From the visual resources librarian's point of view, it became clear that a project of this sort needs its own manager, since dividing time between the running of a branch library and the overseeing of a project of this magnitude was difficult. Two thousand archival TIFF files require a great deal of storage space. After a year and a half the allotted storage space was full. This meant moving images to double-sided DVD-RAMs. In

Fig. 1



theory this works, but in practice another level of management is required. Careful labeling and storage of the DVD-RAMs is necessary since these images need to be readily accessible.

The time it takes to train staff in procedures and software was another challenge for the visual resources librarian. Finding a student assistant who could stay with the project was a concern, mainly because the pattern with student workers is that they need to be trained and then they graduate and move on. The first student who assisted with this project had worked for the Visual Resources Library for five years. He was experienced in accessioning, scanning, cataloging, and using imaging software. The second student was very familiar with Gothic cathedrals and using imaging software. However, it was necessary to train this student in accessioning, scanning, and cataloging. Once trained, the project profited from the second student's knowledge, but the amount of training time must be taken into consideration. Eventually, training manuals were created to aid in the education of future assistants. Team members also had to be trained to use software in order to make the project progress smoothly as there was not enough funding available for hiring a tech support person.

Conclusion and the Future of this Project

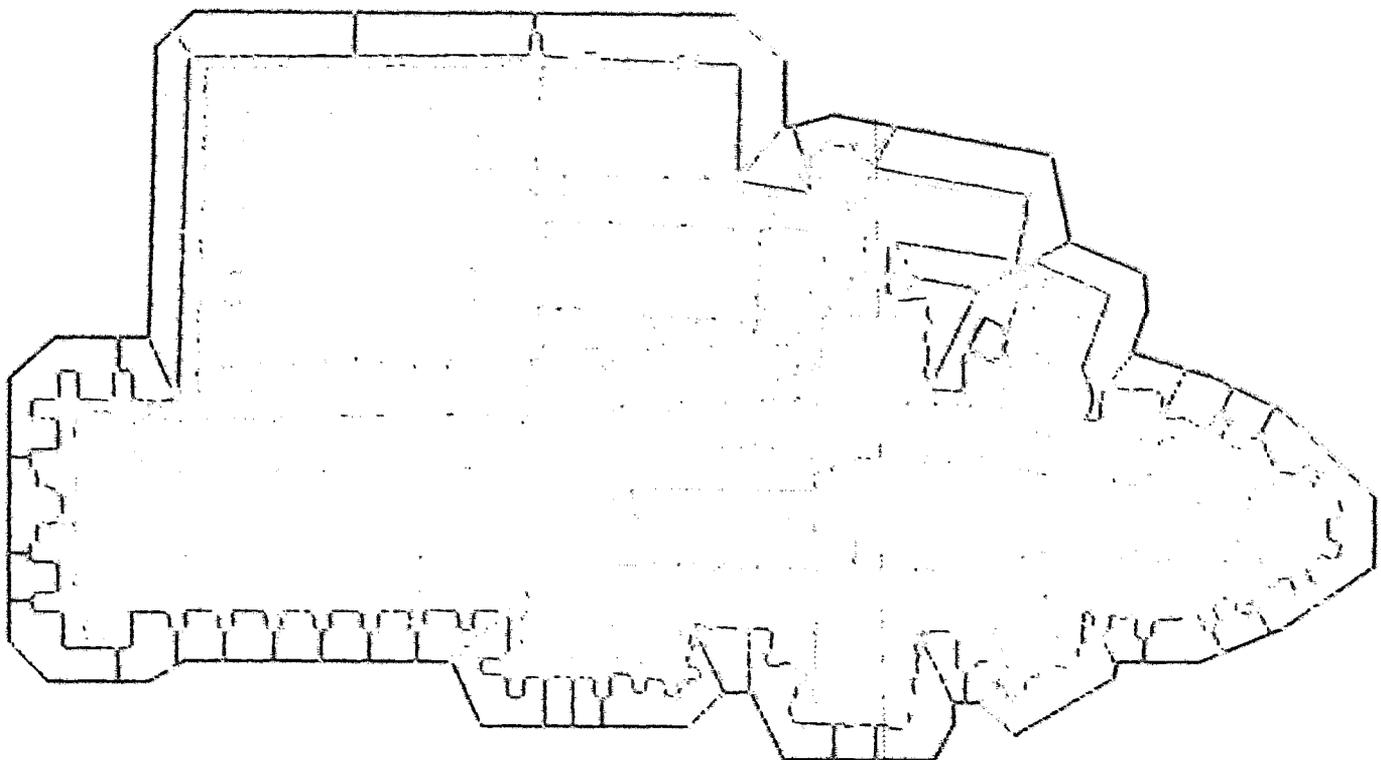
"Canterbury and Saint-Denis—An Interdisciplinary

Online Approach to Two Churches at the Intersection of Medieval Culture" has definitely proven itself to be a project worth continuing. Elizabeth Teviotdale has already worked with one graduate student on creating a case study for the site. In a class on Canterbury planned for summer 2005, she would like to have students research and write guided tours. Robert Berkhofer has used the site, particularly the floor plans, to teach the basic layout of the Gothic cathedral with honors college students. During the Medieval Congress session in May 2004 several attendees showed interest in using the website with their students, while others requested if images could be downloaded from the site for use in lectures and teaching activities.¹¹

In order for the project to continue, several things have to happen. Most importantly, this project needs more funding. The team is currently looking into several grant-funding options. Two years of experience with this project has been beneficial in instructing the team as to where energies and financial support need to be focused. Following is a list of priorities for funding:

- Project manager who works 20-30 hours a week for two years
- At least two graduate student assistants to be working on the project simultaneously for two years
- More funding for a multi-media specialist
- Purchase of new computers, preferably three

Fig. 2



- Purchase of a server dedicated to this project
- Cost of licensing images in order to allow other institutions to use the website
- Cost of outsourcing the QTVR photography
- Updates on all software used
- Cost of training to use software

The goals and the objectives of the project remain the same. Based on the team's and reviewers' comments, this project is going in the right direction. For those who would like more information about this project and the team members, please go to <<http://homepages.wmich.edu/~rberkhof/vcp/>>. 

List of Figures

1. Canterbury Cathedral. Image by Michael VanPutten, Western Michigan University©, used by permission.
2. Canterbury Cathedral. Image by Michael VanPutten, Western Michigan University©, used by permission.

Notes

¹ Jay David Bolter and Diana Gromala. *Windows and Mirrors: Interaction Design, Digital Art, and the Myth of Transparency*. Cambridge: The MIT Press, 2003. p. 12

² Lev Manovich. *The Language of the New Media*. Cambridge: The MIT Press, 2001. p. 19.

³ Case studies for the Canterbury Cathedral project will be the topic of a paper in the "Beyond the Slide Show: New Tools for Teaching and Learning with Images" session at the Visual Resources Association annual conference, March 2005.

⁴ Manovich, 19.

⁵ Robert Berkhofer, III. "Abstract, Teaching and Learning with Technology Grant application" from *Canterbury and Saint-Denis: An Interdisciplinary Approach to Two Churches at the Intersection of Medieval Culture*. Unpublished, February 1, 2002.

⁶ For information on obtaining rights to scan see the following publication: Haddock, Miranda Howard. "Biz of Acq – Acquiring Pictures in the Digital Age" *Against the Grain* 15 n2 (April 2003) 89-92.

⁷ Manovich, 19.

⁸ Allan Heaps. *TLT Project – Canterbury and Saint-Denis Website Review*. Unpublished, June 30, 2003, p. 1.

⁹ Dawn Marie Hayes. *Review of "Canterbury and Saint-Denis: An Interdisciplinary Approach to Two Churches at the Intersection of Medieval Culture"*. Unpublished, June 19, 2003, p. 3.

¹⁰ With a project of this nature, there are bound to be many images of plain masonry walls collected. All these images tend to look alike.

¹¹ Images used in this project have been licensed for use by the WMU community only.

Sources

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