Place Based Web Resources for Historic Buildings

Mark A. Ehrhardt, Mark D. Gross

Abstract

Web sites with animations, panoramic images, sound, and virtual reality can provide a strong sense of place, richer than text and photographs and more interactive than cinema. Constructing these sites demands a great deal of visual and textual information, which must be organized, integrated, and coded for delivery. Existing authoring packages are general-purpose, not specifically for architectural applications, and require technical sophistication. In our process for building Place Based Web Resources (PBWRs), after assembling photographic, drawing, text, and audio resources, the author follows a straightforward series of steps. The Hagia Sophia Web Resource resulted from this process; it includes panoramic pictures, photographs and interpretive text about the building and a VRML model.

1. Introduction

Architectural historians, archaeologists, and anthropologists are discovering the potential of the Web to deliver rich content about historic buildings, places, and towns. Each Web site combines architectural drawings, rendered three-dimensional models, and interpretive text about the building, its history, and its uses. These interactive Web sites go beyond the static imagery offered by models and renderings. Our own previous effort in this vein, the Ceren Web Resource [1], was based on models rendered as panoramic images with image hot spots linked to text. We developed procedures for building "Place Based Web Resources", that is, Web sites that collect visual, textual, and audio information about a building or place. A PBWR offers access to information through a spatial experience of the place. In the Hagia Sophia project we refined the procedures for constructing PBWRs so that we can produce them more easily.

2. Place Based Web Resource Components

The main components of a PBWR are:
• panoramic pictures and/or three-dimensional views

- plans and sections annotated with markers that show principal viewpoints
- photographs of details or views
- architectural analysis diagrams
- animations, video sequences, and audio
- interpretive text related with each image or viewpoint
- a glossary of key terms

The visitor navigates a PBWR site in three ways: (1) by browsing panoramic images and clicking on hotspots; (2) by clicking on locations in plan or section drawings, or (3) by selecting from a navigational menu. Plan and section drawings provide a "you-are-here" indicator showing position and orientation; panoramas and the plan/section provide the navigational backbone of a PBWR site; and an area of the screen is reserved for text and photos related to the current viewpoint.

JavaScript controls the display of various frames and triggers events and HTML with cascading style sheets formats individual frames. Java applets display panoramic images and activate views when the visitor clicks a hotspot. Panoramas may be generated from a modeler if the building no longer exists, or can be stitched from a set of 35mm photographs. Navigational hotspots are identified that lead the visitor to another panorama, and call-out hot spots that provide additional information about an item such as a painting. GIF and JPEG images make up the plan and section frame, and movie files present short animations and video clips. VRML models offer an interactive tour of a building.

3. The Hagia Sophia Web Resource

The Hagia Sophia Web Resource is divided into three areas: panoramas, model, and analysis. The Panoramic area contains all the panorama nodes with hot spots and descriptive text. Figure 1 shows the interface when viewing the central dome.

Figure 1.
The central dome panorama. Note highlighted area in the plan at right.

The navigation menu (left) allows the visitor to move within the Resource. The panorama (upper left) offers access to information via hot-spots. Colored plan map nodes (right) represent locations for which panoramic images and textual information is available. As the visitor moves through the building using panoramas, the plan map displays the current viewpoint. It also serves to navigate the site; when a visitor selects a node, its appearance changes to red arrows to display the position and direction of view. The description area at the bottom displays related information. Below right of the plan map is an axonometric image.

The Model area (figure 2) contains animation sequences highlighting walkthroughs and exterior fly-arounds, wire-frame, hidden-line and rendered images to explain the building , and a VRML model. The Analysis area (not shown) uses diagrams to illustrate the building's architectural principles.

4. Assembling a Place Based Web Resource

Five folders organize the content of the site: text, navigation, Java code, images and image maps. The text and image folders contain content for the Web resource. The image maps and navigation

folders contain information to link images and text. The Java folder contains a panorama player applet and associated hotspot files.

The PBWR process begins by identifying the areas of the place to be described. These areas will appear as nodes on a floor plan of the building to show what pictures and multimedia content are available. For each node, pictures are made and stitched. Next, we identify where in each image a 'hot spot,' is needed that will move the visitor to another panorama or provide related information. We list each hotspot's coordinates and its link or associated action.

Using an image editor (e.g., PhotoShop), we generate GIF images of the building plan with an icon to indicate each node, and another set of images with icons showing the visitor's view orientation once the node has been activated. We create hotspots on the plan image and create a html file with the hotspot coordinates. The navigation JavaScript links three components: the plan image, panoramic imagery, and associated text.

5. Discussion

Our Ceren Web Resource was hand-crafted software. Its development involved many detailed design decisions and several rewrites. Through constructing the Hagia Sophia Web Resource, we've developed and streamlined a process for building place-based web resources. For the Hagia Sophia project, although our process was manual, we were able to organize the components of the Web site and the procedures for assembling them. As a consequence, the time to produce the site was much shorter.

Acknowledgements

References

1 Lewin, J., M. Ehrhardt, and M.D. Gross. **The Ceren Web Resource: Enabling Students to Become Anthropologists In A Virtual Site**. In ACM Conference on Computer Graphics (SIGGRAPH 98) Conference Abstracts and Applications, p 42-43, 1998

Mark A. Ehrhardt (1) and Mark D. Gross (2)
(1) Department of Design , Carnegie Mellon University, Pittsburgh PA 15213
(2) Department of Architecture, University of Washington, Seattle WA 98195-5720
mdgross@u.washington.edu