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in Candidacy for the Degree of
MASTER OF FINE ARTS

African Voices:
An on-line exhibit for the Museum of Natural History,
Smithsonian Institution

by

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THESIS STATEMENT

The purpose of this project is to develop a network-based interactive model for disseminating information contained in a museum exhibition. This will encompass developing a logical navigational design, translating the exhibit content into an effective information layout and relating it to the user through a cognitive interface.

Specifically, my intent is to develop and construct the foundational structure and supporting elements of a website for the African Voices project, an exhibition in the Museum of Natural History at the Smithsonian Institution in Washington, DC.

The goal of the website is to provide users with the information they would gain by the direct experience of visiting the exhibition, albeit on screen. This information will be delivered with a visually stimulating, cognitive approach. The user interface will include graphical elements which are intrinsically African, but couched in a familiar navigational design with text labels to reinforce meaning. This will add a learning dimension to the on-screen experience. Instead of generating arbitrary iconographic navigation symbols and applying an external meaning, I intend to use culturally established graphical icons which already contain meaning and apply them to the navigational design. I also intend to incorporate African graphic patterns and coloring as motifs in the design elements of the project.

The target audience would include the public who cannot physically travel to the exhibition; those who intend to go and would like to gather information before they visit; those who have visited and want to return to some item of interest; and to those who are interested in collecting the information contained within the exhibition. This target audience has a basic understanding and knowledge of on-screen publishing projects, at least some (even limited) direct experience in using the world wide web or will have seen or used CD-ROM-based interactive titles.

CONCEPT AND OBJECTIVES

The African Voices Project is a new exhibit for the Smithsonian Institution. It is one of the new exhibitions that takes the latest approach to curation that the Smithsonian is fostering. It is being developed in conjunction and cooperatively with Africans, African scholars and community input. This is a departure from the patronly approach to museum stewardship that the Smithsonian has been criticized for in the past by representatives within certain ethnic groups. The exhibition hall will not open until later this year, or perhaps even next year. This is a unique opportunity for digital media publishing — the only existing aspect of this exhibit will be this electronic, interactive website.

The main topic area of the website will introduce the subject of the exhibition to the audience. It will provide information on the reason for the exhibit, the reason for the design of the navigation interface and introduce users to six sub-topic areas; Living Spaces, Work and Environment, Kongo Crossroads, Wealth in Motion, Diaspora and Market Crossroads.

There are many specific exhibit examples within each sub-topic area. To undertake all of them for this interactive project would be unrealistic given the time constraints involved for completing this assignment. Also, as the floor exhibit is simultaneously developing in Washington and does not physically exist yet, specific exhibit items are still being gathered by the curators.

Therefore, I have elected to concentrate on one specific example per sub-topic area. If I complete a particular example early enough, or the existing material does not seem to expand enough on that topic area, a second exhibit example may be added.

The greatest challenge of this project is delineating the exhibit examples into separate topic areas. As is endemic of most things African, it is difficult to extract concepts or topics out of the whole African experience; every item relates to everything else. Within the actual physical exhibit in Washington, a visitor can walk through the hall without controlled discretion, ambling through the exhibit area and spatially relating to many exhibit items simultaneously. The challenge for me is to break down the exhibit examples into single pages, that is, computer-screen displays, while simultaneously maintaining the logical relationships that certain exhibit examples have with one another.

Similar to a pamphlet or brochure introducing the user to the project, the main topic area will act as a "return to" area, or "homepage," which

along with introducing the exhibit will include a table of contents for the six (linked) areas and a brief description of each. The user will be able to click to each of the six areas from this point as well as find a link to a "Help" and "Site Map" sections. The "Help" section will explain to the user how to navigate the site. The "Site Map" section will consist of a hyper-map flowcharting the overall site architecture. Another item may include a searchable database, where a user may be directed to the topic desired by entering in keyword search. Another item may link to supplemental reference material related to the exhibit topics.

The **Living Spaces** area consists of the beliefs, values, processes and ideas that bind people and families together and unite communities in Africa and the Diaspora (the worldwide African community). Also, this section will attempt to show how African peoples use objects, both spectacular and ordinary, to communicate values and beliefs, to evoke memory and to embody history. The specific example for this area is the Somali Nomadic Home. It will be the central catalyst for illustrating the roles of marriage, family, gender roles and family identity in a cultural setting.

The **Work and Environment** section will attempt to show the range of work people in Africa engage in and illustrate how work shapes both the social and ecological landscape of the African continent. The main exhibit example here will focus on pottery, a female occupation, and metalsmithing, a male occupation. Specifically, I intend to highlight a famous African potter, Ladi Kwali, her work and her influence in the pottery world.

The **Kongo Crossroads** topic area is a space for users to become familiar with the African experience of the movement and transition from the world of the living to the world of the ancestors, and the movement of aspects of culture from Africa to the Americas. The main exhibit examples focused on for this project are male and female funerary grave figures, their development and roles as part of ancestor veneration in the African community.

The **Wealth in Motion** topic area explores the movement of ideas, goods and peoples within Africa and beyond, and introduces visitors to the dynamism and vitality of contemporary African commerce and transportation, which connects diverse African communities to the global economy. For the exhibit example, I intend to focus on Bamana mudcloth, including the work of Nakunte Diarra, a well-known Malian mudcloth artist, Chris Sedou, a Malian fashion designer and Ismael Diabaté, a Malian artist who uses mudcloth for his medium.

The **Diaspora** topic area will illustrate the connections and influence Africa has had with other continents and peoples throughout world history. A main section of this area covers the African Diaspora, its global dimensions, and the movement of people and ideas within the Diaspora and the continent, both voluntary and forced. Specifically, I intend to concentrate on an aspect of the Diaspora community in Brazil, namely the African-based religious practices and objects found in a tenda, or religious goods store.

The **Market Crossroads** section will illustrate that the market is a place of social and economic exchange where the products of labor are brought together and exchanged. My main exhibit example will focus on a stall in the market that sells Blue & White cloth. It will feature the cloth and also the contexts in which the cloth is used, such as funeral rites and Sunday dress, and the meanings associated with the cloth.

RESEARCH

The main focus of my research concentrated on two paths. First, I looked to see what other museum websites exist and evaluate their strengths and weaknesses. The second was to explore web software developments in order to develop potential interface capabilities.

While on the web, I also searched across a multitude of on-line style guides from various sources that elaborated either on the technological considerations or on aesthetic considerations for publishing on the internet.

In researching for museum-related websites containing African culture, art, history or exhibitions, I found surprisingly few (accurate) search results. While many museums do have African sections containing art objects or cultural exhibitions, there exists no major exhibition sites containing the same subject matter as my project. Therefore, I focused on analyzing a few museum exhibition sites, to see how their information was delivered, what information was delivered and the approach to designing this information.

There is the National Museum of African Art, one of the official websites
of the Smithsonian Institution.

This site (*figure 1.*), *http://www.si.edu/organiza/museums/africart/start.htm,* is a
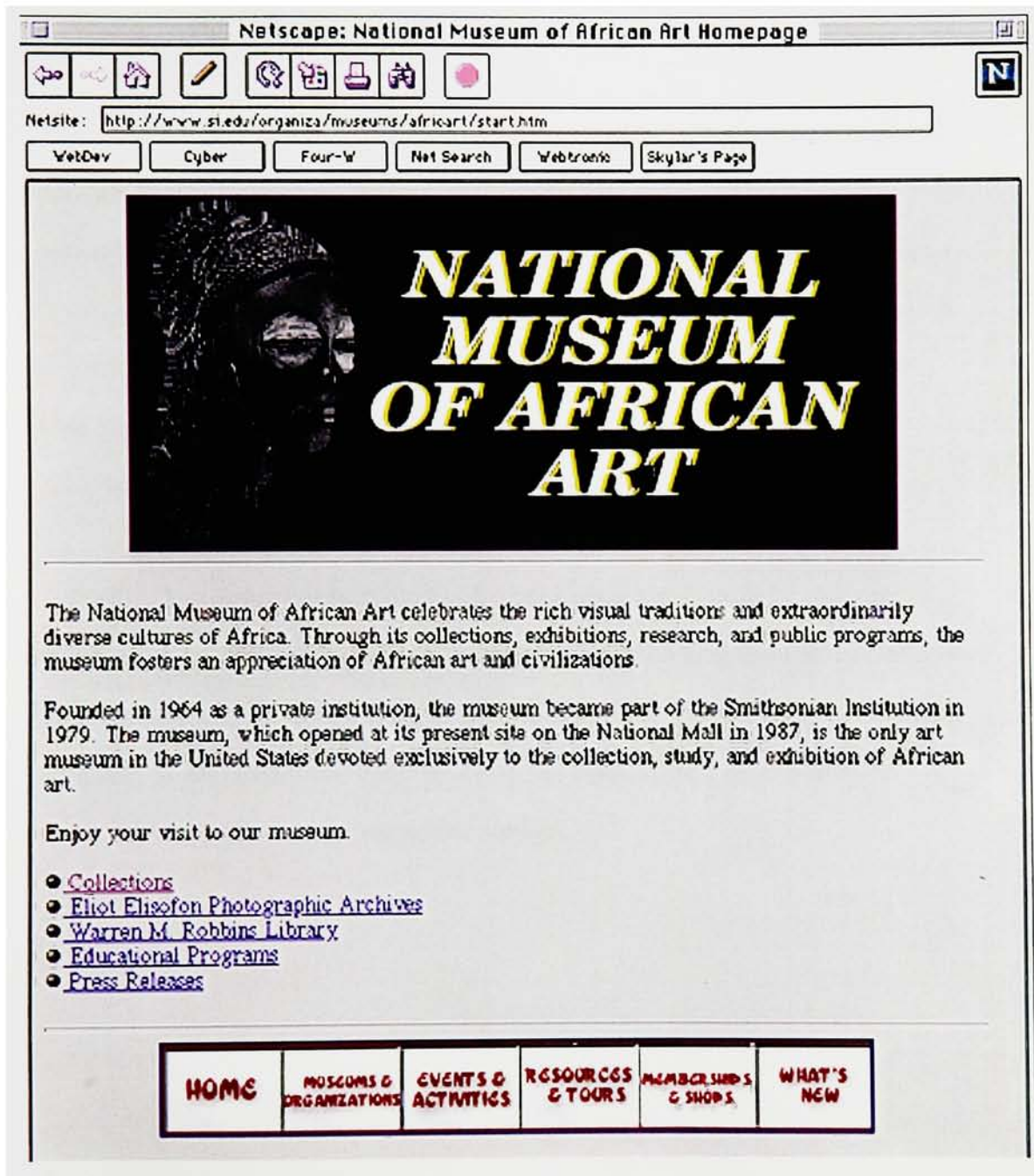

Figure 1.

poor representation of the potential of the web to exploit a museum's content and display this information in an engaging and informative manner. There are confusing and illogical, redundant links (the main banner is hyper but returns to a page with the same information on it), and the design employs a basic HTML style format.

The child pages (*figure 2.*) of this website are sparse. There is an image on the left with minimal caption information beneath. There is no background color; the default gray is used. Perhaps they do have to deliver to the lowest common web denominator, i.e. a 14" screen and a 14.4 modem at home, but this site, like many, many others, is static and visually boring. If one were just going there to retrieve information on an item, it may be useful, but it could also be more engaging.

Equally disappointing is the main Smithsonian Institution homepage section (*figure 3.*). Poor layout, weak graphic design and inappropriate use of table borders illustrate what happens when the job of web publishing is given as an additional duty to someone unqualified or to someone unskilled in layout and interactive design.

Netsite: http://www.si.edu/organiza/museums/africart/collect/object.htm

| WebDev | Cyber | Four-V | Net Search | Webtronio | Skylar's Page |

NMAfA Collections

The Art of the Personal Object

Chair

Ngombe peoples, Zaire
Wood, brass tacks, iron tacks
H. 24 in. (61 cm)
Museum purchase, 90-4-1
Photograph by Franko Khoury, NMAfA.

Stool

Dinka peoples, Sudan
H. 7 in. (17.8 cm)
James Smithson Society, 89-8-2

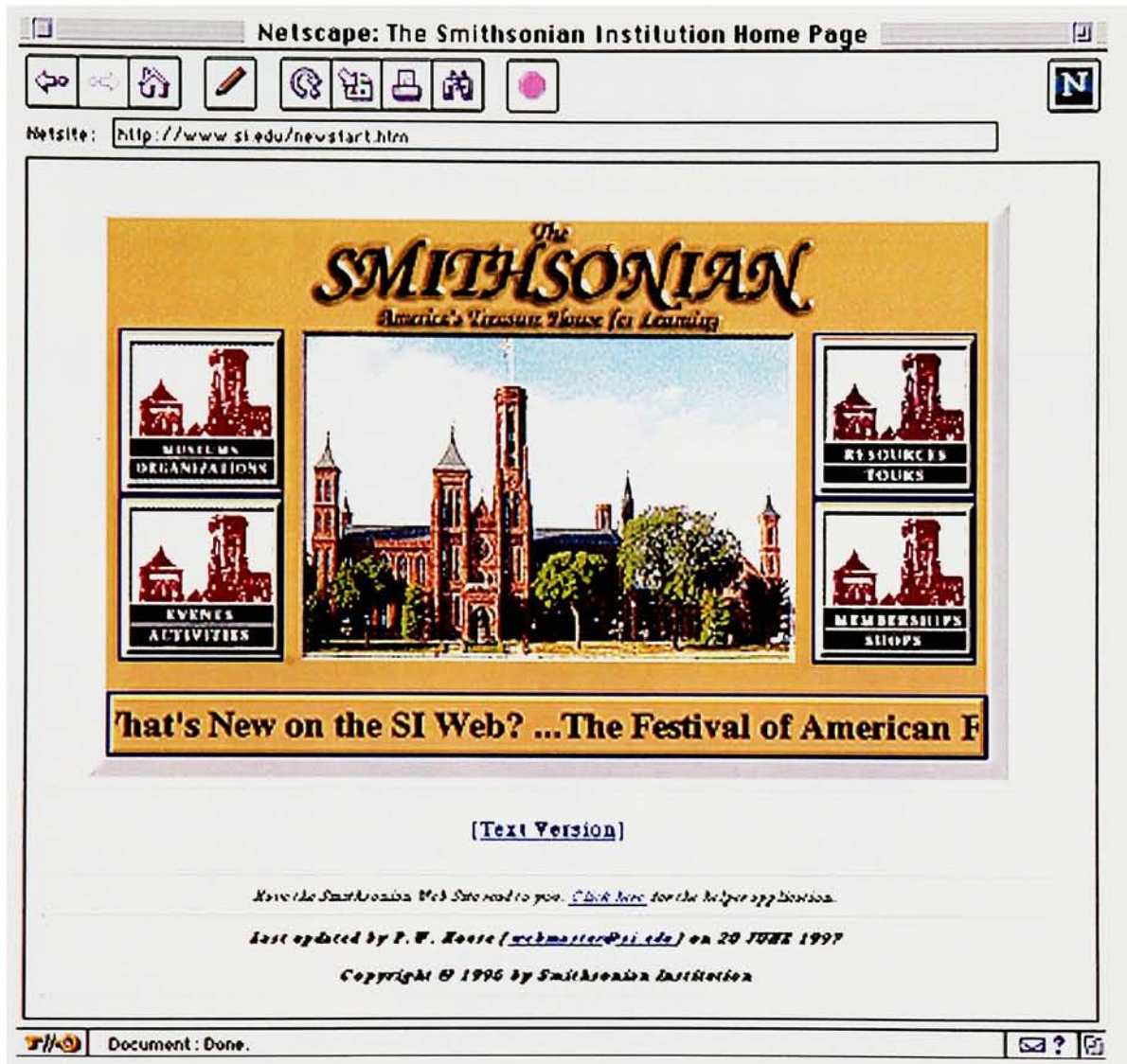Photograph by Frank Khoury, NMAfA.

Snuff containers

Figure 2.

Figure 3.

The Royal Ontario Museum, *http://www.rom.on.ca/* attempts to add a bit of visual design but they seem to have gone to the other extreme with regards to clear site layout (*figure 4.*).

I found the site somewhat difficult to navigate. They tried to create an iconographic navigation with supporting word-based redundancy, but the defining words were as vague as the icons. They redeemed this feature by having a
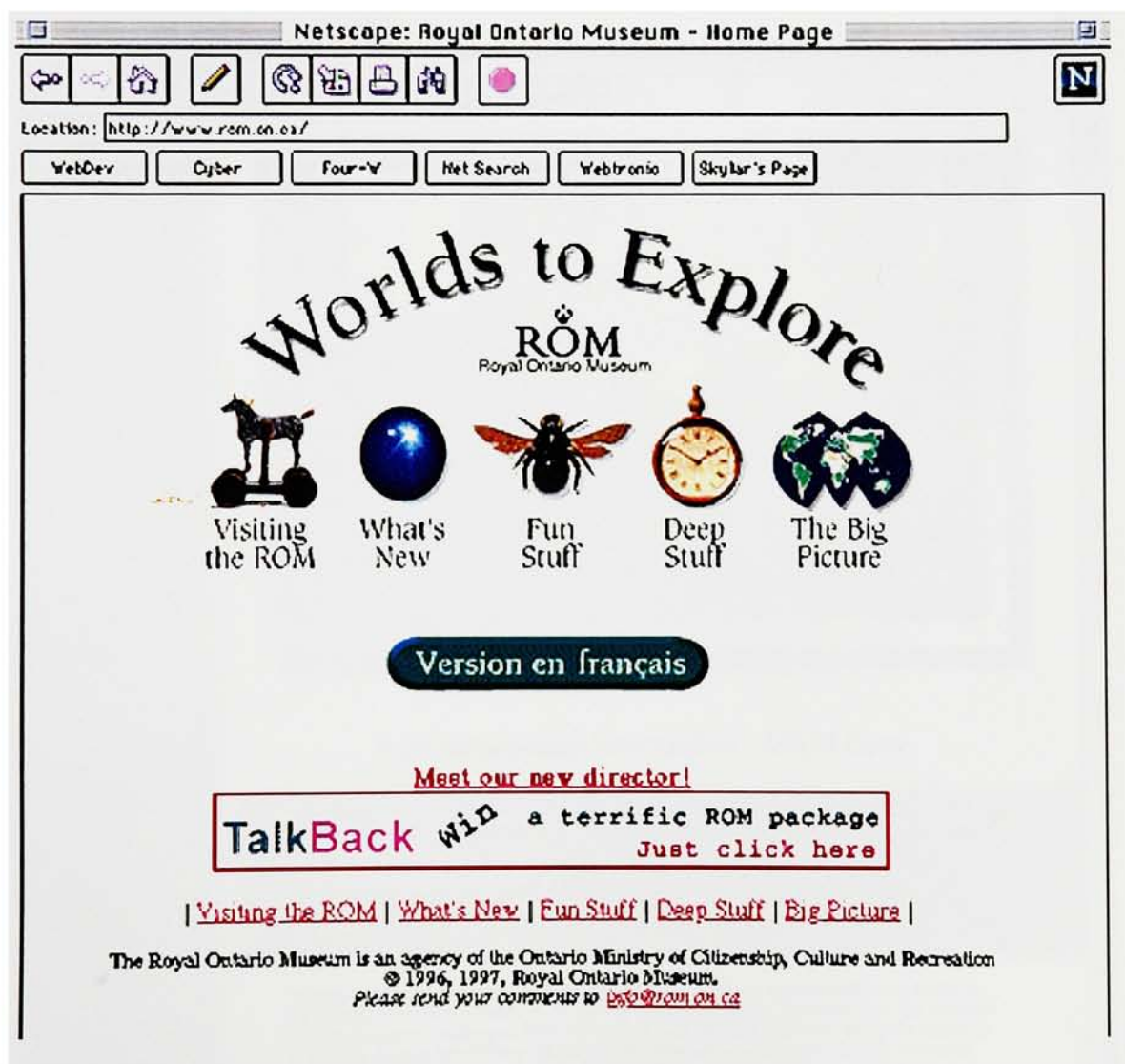

Figure 4.

section called "The Big Picture," which located on one page the relevant sub-nodes and topics of interest. They do employ a navigational design strategy by having the main nodes accessible via hypertext at the bottom of every page. A perceived shortcoming was too little information per exhibit page, making the user click to get at page after page of information.

The Milwaukee Art Museum, *http://www.mam.org/* , has the cleanest approach to museumship that I have seen on the web (*figure 5.*).

Figure 5.

They incorporate a common frames approach: indexed topics on a thin left side frame with a main target frame occupying the rest of the browser. The index is sensitive to typography and the overall look does convey a feel of a metropolitan museum. Unfortunately, when the user navigates to the "exhibitions" section, the standard scrolling page of image and text appear, albeit with an attempt at a book-style approach to the relationship of word and image. I still found it too sparse to really get more than a taste of the exhibit; it barely whetted my appetite to get out to Milwaukee to see the exhibitions (I reviewed two of their listings: Calatrava Architecture and 150 years of Milwaukee Photography.)

As my research and observation of websites continued, I found that Lynda Weinman's book Deconstructing Web Graphics was helpful in breaking down particularly successful sites from a broad range of topics and noting what made them successful.

Weinman outlines her chapters by aspects of a particular technical issue and illustrates that issue with a case study of a particularly successful website. I found her coverage of such topics as storyboarding, low-bandwidth design, browser-safe colors and tables particularly useful as I developed production methods for the African Voices site. These aspects concerned me the most because they directly relate to one of the key objectives of the site — optimal download speed and consistent display regardless of platform or connection.

Achieving optimal download speed meant that I needed to limit the size of the total number of files per page to a point so that the page would not take a long time to load while using a modem. Conversely, I did not want to make the pages so short that the user had to click needlessly in order to get at the information on subsequent pages.

My goal of consistent display regardless of platform or connection meant that I needed to include a number of factors in my decisions while building the site, such as browser-safe colors, text displays and special software plug-in needs.

For example, in an early prototype of the African Voices website I used a background graphic that I thought would carry a pleasing and unifying graphical element throughout the site. The image was light brown with a large, faded Adinkra symbol. It was big enough so that it tiled (repeated) only once within the browser window but consisted of only 28 colors so that it loaded quickly. It looked pleasing on my Power Macintosh 7500 with "thousands of colors" screen resolution, but when I viewed the site elsewhere on a PC with only a 256 color resolution monitor, the light brown background field turned to lime green and the darker Adinkra symbol turned a deep purple hue.

After numerous experiments I decided to forego the background graphical element and developed a unifying black triangle pattern along the left side with a browser-safe tan color for the background image. This tan color and black triangle established a feeling of coherency for the site as a whole and

developed a natural color scheme consistent with the earthiness of the objects displayed from the African exhibit (*figure 6.*). I subsequently continuously tested the graphics and images I produced for the site to ensure they would be visually pleasing with a monitor having only 8-bit resolution.

Figure 6.

One of the primary observations I made about Weinman's book was that each of the websites she covered created a specific environment within their sites. As opposed to simply displaying text and images, as in the National Museum of African Art website reviewed above, each site developed a certain look and feel related to their subject.

For example, Hotwired (http://www.hotwired.com) is the on-line counterpart to a magazine devoted to digital technologies and social issues related to the information age. The publication's pages are loud, often exploiting neon and fluorescent inks and follow a very avant garde format. The website is consistent with this style, incorporating the bright pastels and saturated hues of the browser-safe color palette and simple, iconographic symbols reminiscent of 1960's Op art. This cross-media style motif establishes a connection between the printed

matter and their website and is consistent with the concept of "one product, one voice," a relationship I wished to create between the African Voices museum exhibit and the website counterpart.

I found the primary design principles of <u>The Design of Everyday Things</u> by Donald Norman to be elementary and insightful in developing the website. Norman uses fundamental points in the development of logical design — visibility, a good conceptual model, good mappings, and feedback. (52-53)

• *"Visibility. By looking, the user can tell the state of the device and the alternatives for action."* I found this advice useful as relating to letting the user know where they are on the site and letting them know what alternative hyperlinks (text and buttons) they had in order to navigate the site.

• *"A good conceptual model. The designer provides a good conceptual model for the user, with consistency in the presentation of operations and results and a coherent, consistent system image."* This related to developing a consistent look and feel for the African Voices site — reinforcing the design motif through the topics and sub-topics for reliability, and consistently placing correct navigational controls in plain sight and in logical order on each page throughout the site.

• *"Good mappings. It is possible to determine the relationships between actions and results, between the controls and their effects, and between the system state and what is visible."* This principle relates to the navigational interface I developed using the Adinkra symbols. As they are not common visual

symbols, their meanings needed to be translated literally and reinforced with a label describing their action in order to gain a greater understanding of their usage. This principle also was valuable in developing the architecture of the site: going from general to specific, homepage to subsection page to special topic page either in a linear or non-linear manner.

• *"Feedback. The user receives full and continuous feedback about the results of their actions."* I found this principle applies to letting the user know where they are at within the site. I applied this concept by using title graphics within each section as well as the file names that appear in the URL window of the browser.

Clement Mok, in his book <u>Designing Business</u>, explains how to develop website content into a manageable plan and shows a logical execution of system architecture. He breaks down, by steps and definitions, different design roles for achieving effective information delivery. By developing organizational models, the information has a relevant design to the user. This is fundamental in the design of the user interface.

Mok expands on the concepts that Norman developed: Predictability, Consistency, Progression, Natural Constraints, Visibility, Transparency, Feedback, Modes of Operation, Pace and Appropriateness. (134-139) On the principle of Progression, Mok explains that "everything in an interactive system should progress from simplicity to complexity. A user should never be confronted with more complexity than necessary; unasked-for complexity diminishes a user's interest and involvement." (134)

With my topic covering several aspects of African peoples, lives and cultures, I found this approach critically important so that I did not lose the user by displaying complex data in top-level pages. Going from abstract philosophies to concrete examples gives the user a greater understanding of the topics and items contained in the exhibit. The information is delivered in a relevant and supporting environment.

SOFTWARE APPLICATIONS REVIEWED

I deliberately hesitated on deciding what technologies to include in the website due to the rapid development and deployment of various software tools for enhancing web browsing.

Because of my decision at the end of the 1996 Spring term, in my first year, to proceed with the topic of African Voices, and my desire to make it an internet-based project, due to the increasing popularity of the world wide web, the subject matter and mode was already decided. It was a matter of planning and designing the information for the internet. But the rapid, near monthly emergence of web technologies made me delay the execution of production until the start of Spring term of my second year because I wanted to see which technologies would become ubiquitous and which would remain niche capabilities. During those nine months, features such as frames, Java, JavaScript, QuickTime Virtual Reality (QTVR), Style Sheets, Animated GIFs, Shockwave, streaming audio and video developed, stabilized or fell out of favor.

Frames (new to Navigator 2.0) in a web browser enable users to load new pages within defined, targeted sections of a browser without refreshing the entire page screen. This can be very helpful for ease of use because certain items, such as navigational icons or other repeatedly used links can be constantly accessible and do not disappear with each mouse-click. My decision not to use frames (contrary to my original intent) stems from their drawback of what is nicknamed "onion-skinning." This is the unintended effect of pages outside the website loading within the website's framed window. It happens when a user links to a page external of the site. It ruins the designed environment and is annoying to the user because the requested page is now fitted within a smaller window within the browser. This particular aspect of frames has become a legal debate over who is allowed to display someone else's content.

Also, frames have frame borders. If a user is navigating the internet using Netscape 3.0 or newer, the HTML tag, <FRAME BORDER=0>, hides the default gray border, but, in keeping with my goal of consistency across platforms, users navigating with Netscape 2.0 or older version still view thick, gray frame borders, rendering an elegant design instantly clunky and mechanical-looking.

Java is a programming language that enables dynamic, extended capabilities to webpages. It uses a library of object classes to spawn features within the browser window. Java is continuing to grow in popularity but requires an understanding of object-oriented programming and skill

writing code in a programming language. I decided not to use Java applets because not all browsers are Java-capable, so I would be excluding a certain percentage of users.

JavaScript, on the other hand, is supported by most browsers, starting with Netscape 2.0, and can be used to increase webpage functionality and is capable of incorporating simple, dynamic functionalities into a webpage. I felt JavaScript was compatible with my design objectives and incorporated it for launching a separate browser window for objects in the Kongo Crossroads section. This relates to QuickTime Virtual Reality (QTVR), which I shall discuss further in the Production section.

Animated GIFs are image files that have an in-line order of display and stream into the browser in a manner similar to traditional cell-frame animation. They require no special plug-in, are in a ubiquitous file format and can greatly enhance a page's motion and design. Their only disadvantage is that they can be really annoying when used repeatedly or without reason. I decided to take advantage of their streaming capability and created a looping sequence of a Ghanaian market scene shot on video by an anthropologist visiting Accra, Ghana. This lends a sense of the environment in which the exhibit topic, Blue and White cloth, is used and sold in the Market Crossroads section.

Because of the plug-in requirements and the memory demands, I decided against using Macromedia Shockwave files. These are files that are created in Macromedia Director and saved in a specially

compressed format that can be delivered over the internet. Shockwave files are not as common as QuickTime, can require a (relatively) large amount of memory to function and do not "gently degrade," i.e., go unnoticed if the browser doesn't support it. If the browser does not have the Shockwave plug-in, only a blank space appears where the file should be. This defeats one of my main objectives, which is to target the website for the greatest possible audience.

Streaming audio and video have yet to develop a commonly adopted platform and are available in many different formats using niche applications. It is still too early in the evolution of the world wide web to employ a streaming audio or video file in a website intended for a vast user audience.

PROCEDURE

I approached the Smithsonian about this website project late in the Spring Term of my first year of the Computer Graphics Design program at RIT. My interest in African Art developed during my undergraduate studies when I took a class in African Art History at George Mason University in Arlington, Virginia. The instructor, Christine Mullen-Kreamer, was a guest lecturer whose full-time position was the curator developing the African Voices exhibit in the Museum of Natural History.

During my first year of study at RIT, the world wide web dramatically increased in capability and popularity. The more I used the internet,

the more I became intrigued and enamored with the possibilities of creating a project for the internet. I approached Christine Mullen-Kreamer about using the African Voices project as a topic for my thesis and, in return, she would receive the website upon completion and could use it as her museum's official website, should she so desire. This arrangement was mutually agreed on, and I decided to proceed with creating an interesting and engaging website as my thesis project.

DEVELOPMENT

During the development phase, the Smithsonian created a team whom I met with to discuss goals and objectives for this prototype website. The team consisted of Christine Mullen-Kreamer, exhibit curator, Michael Mason, content specialist, Letty Bonnel, development liaison and Bea Wuethrich, writer. Our communications centered on such points as what to include, what not to include, what items may be omitted and items that were subject to change. We determined to proceed on a plan that would include one specific item from several different topic areas, once those topic areas were decided. If time permitted, a second specific item would be included, and so on. This allowed a hierarchical structure that would go from abstract to concrete. Thus, the visitor would begin with an overview, or introduction, to the African Voices exhibit. The second level pages would explain their respective topic areas, and include kernels of information about the specific items linked below on each child page.

Determining the actual items to include proved to be difficult because of the changing nature of the actual exhibit itself. Because the exhibit is yet to be built at the Museum of Natural History, many changes, additions and deletions are still occurring, and their plans for what will be included in the exhibit keep changing. Despite this, we continued to adopt the items we felt would most likely be included in the final version of the exhibit.

In order to present an effective presentation of what the African Voices exhibit will be like, the website needed to have representation from diverse areas of the exhibit. This was easier said than done. The difficulty of African art, when couched in anthropology and not art history or aesthetics, is that it is connected to the sociological and communal aspects from which it came. We gave constant attention to restraining "scope-creep." In other words, clearly defining the limits of the thesis project. This meant including enough content for a realistic and functional museum website prototype, but limiting the amount of items included so that production of the site could be completed in a timely manner and by the deadline for the presentation at RIT on May 2, 1997.

Upon the start of the 1996 Winter Term at RIT, I met again with the Smithsonian team to finalize the topics that would be included in the site. Then, as the time to start production neared, I verified with the Smithsonian team the items I was going to include. On this final verification, we discovered that two of the items I intended including on the site, the men's and women's associations initiation rites, had subsequently been dropped from the actual floor exhibit by the Smithsonian committee, so I had to delete them from the website as well.

We also established a content delivery methodology. Letty Bonnel became the main point of contact within the African Voices office, liaising between me and the team as far as coordinating the deliverables for each specific item. This reduced the chances of duplicity of effort on their end, and allowed me to coordinate with one person the status of material that was under development by many different people. This minimized the reverse-duplicity of effort on my end, allowing me to clearly track the information I was expecting to get and the information I still needed.

I developed a tracking sheet template (*attachment 1.*) that I faxed to my liaison, Letty Bonnel, who included an updated version of it with each shipment. With this tracking sheet, I could determine the status of work that I had, work that I had requested, work that I still needed from the Smithsonian and work the Smithsonian still needed to acquire or duplicate for me. This tracking sheet also helped during telephone calls, as both the Smithsonian and I had a copy of the same sheet with which to reference items. This approach proved effective in managing the status and accountability of over 120 photographic images and 50 pages of captions and text for over 100 specific objects and subjects.

Many of the artifacts in the exhibit interrelate in a way unlike most western historical artifacts. For example, a pottery piece might just as well fit into the category of **Work and Environment** as it would **Work and Gender Roles,** because only women generally work in clay. Also, that same pot might fit under the category of "marketplace," because the pot is intended for sale in the local market. In addition to this, the

pot may have markings on it which relate to a particular female society, or that it is used for only certain types of meals or ingredients or only at certain ceremonies, all factors of "power and wealth" within a community.

If a visitor is walking through an exhibit at a museum, these interconnections can be made and understood by establishing the layout of the room and walls to allow the random display of establishing information in a non-linear manner. If one translates that same object to a single page of information, as on the web, where only one page of information is displayed at a time, then it's as if going from a 180 degree view to wearing blinders, seeing only one particular item at a time. This is why it is crucial to deliver information about that item, i.e. the pot, supported in a contextual framework of parent pages and relative links. This puts the pot into a better natural perspective and truly conveys the interconnectedness of African culture.

In order to accomplish this accurately and effectively, I had to develop a flowchart. This enabled me to create iterations of a hierarchy of topics and sub-topics, a linking structure and to more accurately view the development of the site. Working in a "top-down" approach, I was able to draw larger abstract "containers" for loosely related items, then work my way down to place specific items in their relevant subject areas. I could then edit this flow-chart in a "bottom-up" review, ensuring accuracy of placement, making sure it was within the correct sub-topic area. This also enabled me to look lateral-ly at subjects that resided within other sub-topic areas and consider whether a hyperlink relationship should exist between the two topics. Ultimately, I determined one that I felt best represented the site structure (*figure 7.*).
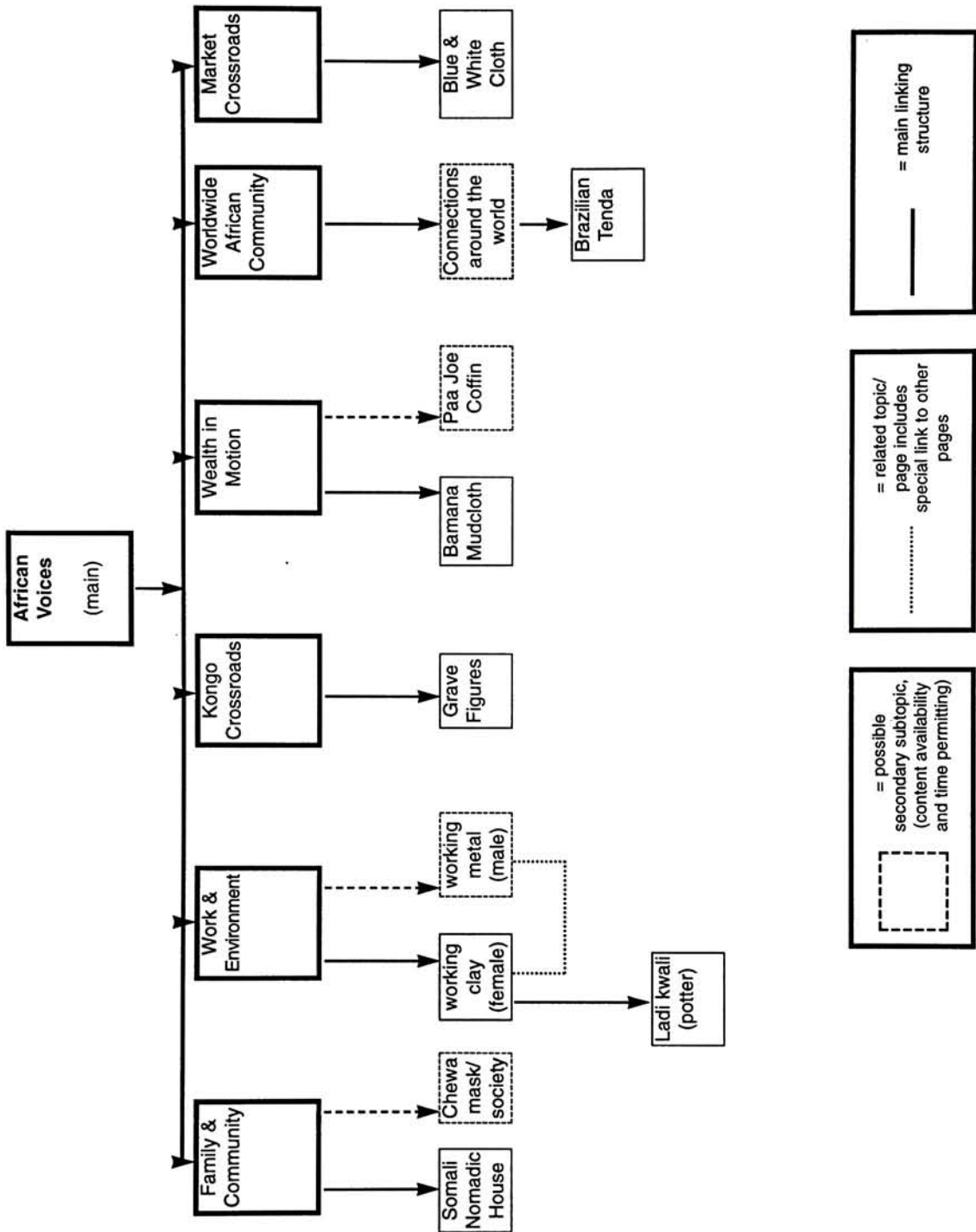
Figure 7.

Upon completion of the flowchart, I met again with the Smithsonian team and they reviewed my proposed flowchart. Michael Mason agreed with most of the relative associations made except for the link between the Somali Nomadic house, Working Clay, Bamana mudcloth and Market Crossroads. Upon querying this link association, I believed that the Somali Nomadic House included pots specifically made by women, which linked them to the Working Clay section and the Bamana mudcloth as well as the Market Crossroads sub-topic section.

Michael determined that although the Somali Nomadic House items and the Working Clay relationships were valid, they were confusing to the link layout of the website because Somali Nomadic House really dealt with an environment, including the items it contains, and Working Clay shared some of this attribute but not in a way that could be construed as accurate for the web. This is because the main focus of the Working Clay section deals with the substance of the historical and cultural aspects of making pots, while just mentioning gender roles, as opposed to gender roles in the development of the materials and tools for daily life, as in the Somali Nomadic House section. The Bamana mudcloth, although again made mainly by women, seemed incongruent with the linking structure, so the link association was dropped. The Bamana mudcloth related to women working with earth and making market items, but not in a way that related to the Somali Nomadic House, so the Market Crossroads link was also dropped.

With the information architecture in place, I proceeded to develop the graphical "look and feel." During the summer between program years I developed thumbnail images of possible user interfaces.

PRODUCTION

The website was created using Macintosh PowerPC computers. Color photographs and slides were scanned onto a Kodak PhotoCD; Adobe AfterEffects, and Apple QuickTime VR Object 1.0b software were used to create QTVR Object movies; Macromedia SoundEdit 16 was used to create a QuickTime (QT) sound file; Adobe Premiere 4.0.1 was used to create a QuickTime movie and GIFBuilder 0.4 was used to create an animated GIF file from a QT movie. The website was authored using Netscape Navigator Gold, and the HTML was subsequently edited using BBEdit 4.0. The files were transferred to a specially established account, named "africa" on RIT's Grace server, using Fetch ftp software.

The sound and video files were recordings on magnetic tape received from the Smithsonian's holdings. I included a QT audio file of female Somali wails in the Somali Nomadic House section, a QT movie of carpenter Paa Joe constructing fantasy coffins for the Wealth in Motion section and a looping animated GIF of a video clip of a cloth stall at the 16 December Market in Accra, Ghana.

QTVR

I used Apple's QTVR Object software to create two movies of Kongo figures. The advantage of QuickTime Virtual Reality technology is that the user can see all sides of an object like a Kongo fertility figure and gain a greater understanding of the design and form of the subject. This increases the user's understanding of the object and thus adds value to viewing the exhibit. Also, because it uses the QuickTime technology, any QT file, including audio and video, is supported.

For the purpose of showing QTVR capabilities in the thesis project, I substituted museum Kongo figures for figures found in a local African Gallery, Jembatat. I videotaped each figure while rotating on a flat carousel for 360 degrees. I then masked off the background using Adobe AfterEffects and rendered a 19-frame QT movie. Using QTVR Object software, I converted this file and saved it as a ".mov" file.

When a user clicks on the figure's image or appropriate hyperlink, the action launches a new window using a JavaScript code. The page then loads the QTVR Object movie that shows the carved wooden figures of the Kongo peoples. QTVR Object enables the user to click and drag on the movie and rotate the subject image on a virtual axis, simulating the effect of holding an object in hand and rotating it in space.

The disadvantage of QT is that this capability requires a "plug-in," a software application that needs to be installed into the browser before it can be used. Although it can be downloaded from the web for free, it is still a distraction for the user and places an extra task on them. I incorporated QTVR with JavaScript in a way that "gently degrades," meaning it is not required in order to view the site and if the user chooses not to have the enhanced capability, they can still receive the basic, published information.

WEB DESIGN

One of the main challenges I had was to design an initial graphic that fits within the smallest user profile monitor, 640 pixels wide by 480 pixels tall. I also took into account a browser's possible vertical scrollbar and horizontal toolbar. So I limited the maximum width of my pages to 590 pixels and potential top-page graphics to 380 pixels.

For this space on the main page I used a Benin bronze head cropped to a slender triangle dimension and outlined with the main text messages of the exhibit. Beneath this I added descriptive text outlining the six topic areas within the site (*figure 8.*). Originally I wanted to include a representative image for each of the topic areas, adding to the enticement to click through and engage the exhibit. The problem that became apparent to me about this approach was that the topic images would need to be large enough to be recognizable, thus increasing the need to scroll down to see all the topics. I decided to substitute black triangles for the images, reinforcing the triangle motif and lessening the bandwidth load (the black triangle is one image used six times, thereby reducing the file transfer load to 1/6th of the original time).

Netsite: http://www.tso.mit.edu/~africa/

Heroism and hardship. Triumph and tragedy. Liberation and loss.
These experiences have shaped the lives of Africans and
all peoples. From the beginning of civilization, Africans
have created singular traditions and philosophies.

AFRICAN VOICES

Today these cultures
permeate the world.

AFRICAN VOICES tells the
dynamic story of Africa's past and present.

Living Spaces
African peoples create vibrant domestic,
religious, and civic spaces in which life's
drama unfolds.

Kongo Crossroads
Kongo people of Central Africa rely on the
ancestors' blessings for success in their
endeavors and to overcome misfortune.

Diaspora
From the ancient past until today, African
peoples and their descendants have traveled,
traded, and created communities around the
globe.

Work & Environment
Africans have developed diverse values and
technologies based on the interdependence
of the natural environment and human labor.

Wealth in Motion
Africans value many forms of wealth and have
built fortunes on the road, through travel and
trade.

Market Crossroads
The great markets in Africa are crossroads
where local, regional, and global economies
meet.

Tour Start   Site Map   Help   Find   Natural History   Smithsonian

Learn more about these
Adinkra symbols that are used
as navigation icons.

Document: Done.

Figure 8.

The design of a main image, taken from a category topic, cropped into a triangle shape became a recurring motif for each of the second-level pages (*figure 9.*). This second level page included the main abstract messages for that topic area and included specific section highlights that the user could click on the hypertext or associated image and move down into specific exhibit content. This reflected the same approach as the homepage - starting from abstract at the top of the page and leading to specific examples at the bottom of the page through which users could move and gain more content information. This format reinforced the design's usability.

With regard to typographic design, I used attributes of Cascading Style Sheets, a feature of HTML 3.0. Style Sheets are attributes that are set at the beginning of HTML code and affect the way the page is displayed. This includes such items as font face, size, color and formatting. Because of the amount of text within this site, and its importance, I decided to use the font face HTML tag, <FONT FACE="helvetica, arial">, to standardize the display of text across most browser platforms.

I defined the typefaces of Helvetica and Arial because either typeface is found on nearly all computers, either Macintosh or PC. These typefaces are easy to read on a computer screen and gave me some control over the outcome on the user's browser. (Unless a typeface is defined in the HTML code, the browser will use whatever the default typeface is set in the browser's preferences.)

Netsite: http://www.tsc.rit.edu/~africa/html/wealthMain.shtml

Tour Back | Tour Next | Main | Site Map | Help | Find | Natural History | Smithsonian

Africans value many forms of wealth. Historically, Africans have built fortunes on the road, through travel and trade. Money and the things it buys is one gauge of wealth.

Wealth In Motion

But many Africans also reckon wealth in people: the number of loyalties one commands -- from family members, clients, and patrons.

Personal alliances ensure that hard times will be weathered and accomplishments honored. Africans exchange objects of value to mark and make such alliances.

Although standard, rectangular coffins are the norm, Ga family members sometimes commission figurative "designer" coffins that celebrate the status, contributions, achievements of their loved ones.

Designers of home furnishings, accessories, and clothing have capitalized on the strong graphic appeal of the Malian mud-dyed textile known as Bógólan.

Tour Back | Tour Next | Main | Site Map | Help | Find | Natural History | Smithsonian

Figure 9.

DEVELOPING THE NAVIGATIONAL INTERFACE

Beneath the topic descriptions is the navigational interface. This is a horizontal toolbar consisting of graphic icons which represent specific functionalities. The graphic icons are Adinkra symbols, which are meaningful glyphs used by the Ga people of Ghana to decorate clothes and items.

Each icon represents its function within the Adinkra glossary of symbols. Each icon's function is reiterated with a text label beneath the icon. This navigation bar is one of the key characteristics of the African Voices website. The navigation bar includes functions for moving within the website instead of using the browser's toolbar. (*figure 10.*)

figure 10.

ADINKRA LABELS AND MEANINGS

More than 200 Adinkra symbols are regularly used today. Many of these have retained their popularity and original meanings since the mid-19th century. Artists also create new designs with contemporary meanings. These particular Adinkra symbols are not only indigenous to African culture but are also relevant to the content of the website and the functions they perform. They are the mediators between the user and the intangible world of the internet.

There are dozens of Adinkra symbols, and each symbol is embued with layered interpretations that evoke proverbs, stories and traditional sayings. Adinkra symbolism is closely related to Asanté cosmology. The Asanté believe the world was created by Nyame (God). The unseen world, an extension of the visible world, is inhabited by a family of ancestors who serve as mediators between Nyame and the living. Because of their powerful and illustrative qualities, the symbols are stamped on cloth that is worn during serious ceremonies, including funerals. The symbols, their use and placement on a cloth or other object, convey not only a graphical design but also an additional literary interpretation to the object.

Although the origin of Adinkra symbols among the Asanté is unknown, may scholars cite the Islamic practice of talismanic writing on cloth as a possible inspiration for the development of the Adinkra tradition. Islamic peoples in the north traded with peoples in southern Ghana from as early as the fourteenth century. The trade routes that passed through the Asanté nation, established in the latter part of the seventeenth century, connected northern trading centers to the southern coast.

I made my original selection of 15 symbols (*figure 11.*), from the book Sankofa Adinkra Poems by Albert W. Kayper-Mensah, based on their design qualities and related meanings.

(52)
Family & Community

(35)
Home or Quit or
Wealth in Motion

(59)
Worldwide African
Community
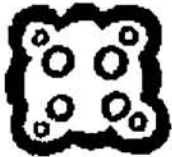
(37)
Kongo Crossroads

(21)
Links or
Kongo Crossroads

(31)
Quit or
Kongo Crossroads

possible section icons

(6)
Homepage

(47)
Go to Homepage

(54)
Market Crossroads

(12)
Back or Previous
or History Fastrack

(24)
Next or Forward

(18)
Search or Zoom

(16)
Search

(23)
Save or Site Map

(42)
Site Map

Figure 11.

After consulting with Christine Mullen-Kreamer on the accuracy of my observations, I edited this selection and re-evaluated the symbols using a chart developed by Kwaku Ofori-Ansa from Howard University. I also visited the Kaiyum Gallery Jewelry Store in the Village Gate shopping center, creators of jewelry based on Adinkra symbols. I felt that if they could accurately understand my interpretation of the symbols for the website, I would be using them in a sensitive and appropriate manner. The personnel concurred that my usage of the selected symbols was appropriate.

One of the buttons, "Tour Next," allows the user to tour the site page by page in a linear manner, as if physically walking through the exhibit from end to end. Subsequent pages include a "Tour Back" button that follows pages in a hard-coded route from end to end in reverse order. A "Help" button leads users to a page explaining the navigation symbols and their functions in greater detail. The "Site Map" button leads users to a single page that contains hyperlinks to all of the topics within the site. The "Find" function takes users to the front page of a search engine where they can seek out more information on topics elsewhere on the internet. This functionality could be expanded by developing a database of the site's key words and implementing an internal search function. This capability can be extended later on, if the Smithsonian so chooses.

The symbols I subsequently use and their original definitions are as follows:

BACK. **Sankofa**: *Go back to fetch it. Symbol of the wisdom in learning from the past in building for the future.*

NEXT. **Nyansapow:** *Wisdom knot. Symbol of wisdom, ingenuity, intelligence and patience.*

SITE MAP. **Damedame:** *multiple squares of a checkerboard game. Symbol of craftiness, intelligence and strategy.*

FIND. **Ohene Aniwa:** *The eyes of the king. Symbol of vigilance, security and excellence.*

HELP. **Nyame Dua:** *God's Tree, or altar of God. It is the symbol of the presence of God and God's protection.*

The other buttons on the navigation bar, "Natural History" and "Smithsonian," use their museum logos and launch separate browser windows which display official Smithsonian museum pages. These buttons launch separate browsers because I want users to continue to keep my thesis project in a window. Should the African Voices website

become incorporated into the official Smithsonian server, these targeted browser windows can be easily re-directed to load into a single window, linking from African Voices to higher domain Smithsonian sites.

IMAGE PREPARATION

Over 100 images were sent from the Smithsonian. Most of these were 35 mm color slides of the objects in the exhibit. Along with the slides were photocopies of the relevant caption information, often from the original field acquisition forms. For example, the accompanying text information of one of the Kongo power figures was a handwritten field caption dating from October 24, 1921, when the figure was acquired by the museum. With guidance and editing from Letty and Bea, I had to re-write some of the captions to make sense to the web audience.

I had the slide images scanned into Photo CD (PCD) files. This proved an efficient way to maintain the images on one stable disc. With the image pac on the PCD, I then chose whichever base resolution I needed, per image, to get the correct amount of file resolution needed to retouch the image without needing to interpolate their file sizes. So that the images looked clean and related to the site motif, each one needed to be masked out of its studio background, adjusted for optimum color and sharpness, given a subtle drop shadow for depth, and edited with critical color reasoning to minimize the resulting file size.

This process took a great deal of time but was crucial to the success of the project. The images need to accurately reflect the objects they represent

but also need to integrate with each other, the design of the pages and the site as a whole. A total of 88 color slides and 4 illustrations are used in the website.

DEVELOPING DIRECTORY STRUCTURE

Regarding naming conventions and file structures, I attempted to make them simple, cognitive, scaleable and transportable. These objectives are for purposes of manageability. If this site is handed over to someone, such as a museum webmaster, with no previous knowledge of the African Voices exhibit or website, they should be able to comprehend the site structure and specifics with minimal help. I wished to make it that way because I feel that good project design should take into account anonymous custodianship. Persons and points of contact on a project should be interchangeable to an extent, and the success of a project should not rely solely on a key figure's subjective knowledge. If the Smithsonian chooses to use this website without me, they will be able to do so by studying the apparent directory structure and relative linking hierarchies.

The naming conventions of the image files and pages follows a specified pattern. All the images used on the site are scanned into a PhotoCD. Their file name is their PhotoCD file number. This makes it an easy cross-reference when editing, updating or building new site content because each image already has a file name and a hard-copy thumbnail image. To rename the images would add another level of sorting and benefit neither the builder nor the user. The user, should they choose to

download a copy of the image, can rename the file to their liking, extracting their title from the inherent, surrounding content or using the HTML "ALT" tag information. The "ALT" tag is used as a remark feature to identify the image file and reflects proper HTML coding styles. If a user is using a non-graphical based web browser, such as LYNX, or is using a browser such as Netscape but with Auto Load Images turned off, the "ALT" tag serves as an image identifier. Also, the builder knows which file is referenced within the HTML code by the nature of its name.

The page names and directory structures reflect the topics they contain and are grouped accordingly. The page names are sequential, such as "bamanaPg1.shtml, bamanaPg2.shtml" and so on. Each topic, regardless of the number of pages, is named "topicPg#.shtml." For example, the help page is titled "helpPg1.shtml," even though there is only one page. Should future needs call for additional help pages, a scaleable naming convention is in place to ensure continuity of naming conventions.

Each topic has its own directory except for site-wide pages such as Help, Site Map, Main and Find. For example, every file for the Bamana mudcloth topic, including images, graphics, HTML, are contained within the "bamana" directory. Thus, I know that all the Bamana images, and only Bamana images, are within the "bamana" folder. The shared items, such as Help, Site Map, Main page and Find, including images, graphics, HTML, are broken into content specific directories,

such as "html" and "images." These directory structure implementations enable manageable and meaningful directory management. Some approaches to site architectures combine all the images into one directory and all the HTML pages into another directory. I find this impedes effective development and subsequent editing of a website because in order to edit a file, a person must sort through the files of the entire site in order to get to the specific topic file they need.

For purposes of this website, I left all of the directories on the same level within the "www" directory. For any other website, I perhaps would have grouped sub-topic directories within section directories simply for file management. For example, under a directory titled "work and environment" would go the topic folders of "pottery" and "metal." This file system maintains the parent/child relationship of the site within a sensible directory management structure. As the website exists now, all the internal links are relative, so the entire site can be moved to another server with the linking structures intact.

RESULTS

USABILITY, TESTING and FEEDBACK

During the production phase of the project, I conducted weekly tests of usability by asking colleagues and friends unfamiliar with the project to sit down in front of a browser, either at work or school or home, and navigate through the site while providing me with their comments and suggestions. I was present during these tests and noted their movements and reactions.

Overall, the general impressions were favorable regarding the images, colors and design motifs. The purpose of the sight was usually clearly understood, even if the person had no interest in African art and culture. The most consistent comments regarded the navigational icons.

Originally, I intended to provide a dual channel navigation scheme whereby the user could randomly select a topic or progress through the site in linear fashion. I wanted to have the NEXT button move the user to the next page of the exhibit in a sequential order and the BACK button perform the same action in reverse order. I hard-coded the URL locations for each BACK and NEXT button on every page, starting at Living Spaces, through Work and Environment, Kongo Crossroads, Wealth in Motion, Market Crossroads and ending at Diaspora. That satisfied the linear requirements but complicated the non-linear scheme.

The non-linear route, where a user could select any section from the homepage, or a specific topic from the SITE MAP page, request the HELP page instructions or use the FIND function, added confusion to the linear order. Specifically, the questions was, "where is back and where is next for a page that does not fit a linear route?" For example, if a user selected Wealth in Motion from the homepage, the BACK button on the Wealth in Motion page took them to the final page of the Metallurgy section. This poor mapping caused users to become confused and frustrated.

After a tremendous amount of frustration (for me) and no clear solution from various on-line HTML resources, the answer came from Steve Deal, a colleague and programmer in Internet Marketing at Eastman Kodak. Steve took the challenge and authored a simple HTML code, called a REFERER (sic), that enables the server-side computer to store the URL of the user's previous location and generate that URL location into a preformatted HTML tag:

```
<A HREF=<!—#echo var="HTTP_REFERER"—>
```

With this code, I could use the BACK button on a non-linear page, such as HELP, and that BACK button would return the user to their previous location, regardless of where they came from. This solved the linear/non-linear compatibility issue. This also created a new format for the site's pages, SHTML.

SHTML stands for Server-parsed Hyper Text Mark-up Language. This means that the server generates the HTML file and performs any special instructions embedded in the HTML. The pages must have the suffix ".shtml" for this to work. The server does not look for commands within standard ".html" files; it just generates the page instructions. For the server to embed the user's previous URL location, I had to rename all the site's pages with the ".shtml" suffix.

I tested another approach to the linear tour by applying the REFERER tag to the BACK button throughout the entire site. A user could go forward using the NEXT button and could return to the previous page with the

BACK button. This test failed completely because every single user then tried to go back more than one page, which resulted in them returning to their original page. For example, if a user was on page 2, and clicked NEXT, they went to page 3. If they click BACK, the REFERER tag returned them to page 2. But if they clicked BACK again, the REFERER tag returned them to Page 3, not page 1 as desired. This became another clear example of a violation of Norman's principle of correct mappings. The users were not going back but rather to the previous page, defeating my intended goal of forward and reverse linear navigation.

The solution to both linear and non-linear navigation capabilities is found in the appropriate use of the REFERER tag. After considerable review of the previous results, I decided to use the REFERER tag on only the non-linear pages. When a user goes to the HELP page, for example, the Sankofa symbol is labeled BACK and will return the user to the previous page. The Sankofa symbol on all of the section and topic pages is labeled TOUR BACK, and the Nyansapow symbol is labeled TOUR NEXT. This naming emphasizes to the user that the button's function performs a specific action, i.e., going to a specific URL, rather than a generic action, such as previous or next. The Sankofa symbol still retains its meaning, "to go back and fetch it," using either of the two labels. It still performs the same abstract action.

CONCLUSIONS

Building a museum website has been a challenging and rewarding experience. In general, the main design challenge was to create a visually interesting screen environment that delivered the subject matter in an

engaging and entertaining manner. Perhaps because I enjoy the topic of African art and culture, the work involving layout, production and content development was always interesting. The most difficult aspects of building this site were solving my own navigation goals and the limiting nature of the internet itself. The world wide web is still in its infancy, even though tremendous advancements of technology occurred during the time between conception and completion of this project.

The web is an amalgam of the best and worst of other forms of mass communication - newspapers, television and the telephone. It has the strengths of page design and the speed of delivery of a publication, the broadcast appeal and dynamic, moveable graphics and sound capability (albeit rudimentary) of television and the intimate, one-to-one interactivity and control of a telephone call. But the web is still limited by the challenges of narrow bandwidth resulting in long waiting times and loss of attention, inconsistent or sometimes uncontrollable displays of graphics and text which are dependent on the user's platform and communication's configuration and the demand that the user understand and easily interact with the information presented.

Long-distance coordinating and communicating with the Smithsonian proved to be of little hindrance in the execution of the project. This was due to the diligent efforts of Letty Bonnel in preparing and sending me the content in a timely manner and the mutual desire of the Smithsonian team to ensure a good-looking and successful website. They provided constant updates of written content and reviews via

email and we spoke on a weekly basis, reviewing the Content Collection forms until I had received everything they were able to provide. They also provided valuable user feedback. I sent them the URL for the website, once it was functional, and incorporated their remarks into the daily iterations, making sure the content was accurate and the navigation logical.

Certain items of the site were more successful than others. The QTVR movies of the Kongo figures were immensely popular, resulting in a local television interview on 3-D applications on the internet. The accurate and innovative use of Adinkra symbols was also successful, resulting in a local Gannett newspaper interview profiling their unique application as a graphical user interface.

This project fulfilled many personal and professional interests. I increased my design and digital imaging skills by successfully delivering a content-rich, visually pleasing, low-bandwidth project to the Smithsonian Institution. They are presently considering adding it to their official website.

I hope the website increases people's understanding of Africa and engenders an appreciation for African art and culture.

African Voices Project — Content Collection

Node: ___

topic: ___

comments: ___

Item: ___

Item	image	text	audio	video	other	Lee has	Lee needs	S.I. has	S.I. needs	S.I. needs to obtain	S.I. needs to dupe	comments

African Voices Project — Content Collection

Node: WEALTH : MOTION
Topic: BAMANA MUDCLOTH

Item	image	text	audio	video	other	Lea has	Lea needs	S.I. has	S.I. needs	S.I. needs to obtain	S.I. needs to dupe	comments
BEDSPREAD WRAP BY NAKUNTE DIARRA	✓					✓						SLIDE FROM UMB RECORD PHOTO / NOT ACCESSIONED YET
MAN'S SHIRT BY NAKUNTE DIARRA	✓					✓						" " " "
WOMAN'S SUIT & HAT BY CHRIS SEYDU	✓					✓						" " " "
MUD DYE PAINTING BY ISMAEL DIABATE	✓					✓						" " " "
WOMAN'S WRAPPER BY NAKUNTE DIARRA	✓					✓						
DIARRA WORKING	✓					✓		✓				SLIDE FROM JAN ANERBE, NAKUNTE DIARRA, P. 10 / NEED PERMISSION
PHOTOS OF PETH'HEY'S AFRICAN EXHIBITION USE	✓					✓			✓			
INTERACTIVE COMPUTER SOFTWARE w/ DIARRA				✓	✓	✓		✓				FROM INDIANA UNIVERSITY LIBRARY
TEXT	✓	✓				✓		✓				BEC WILL SEND

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