

Jonathan Gladden

Graduate Thesis Project
Preliminary Thesis Report
for Design 787:
Design Development + Evaluation
31 May 2000

Report Contents

Overview

Project Title: Visualization of Academic Website Structure through the use of 3-D Computer Graphics & Animation Techniques for the Purpose of Site Planning, Development, and Navigation in the Design of Websites for Arts Related Academic Organizations.

Advisor(s):

Susan Roth, David Bull

Presentation Contents Overview:

Hypothesis:

The use of 3-D computer graphics & animation techniques for visualizing website structure can be beneficial in the development and planning stages of design for arts related academic organization websites, by allowing the designer to better understand user paths of interaction within the site, and to conceptualize channels of information directed at specific categories of users.

Abstract:

Website cartography or the visualization of website structure is critical in the development of academic websites which effectively communicate to their users. 3-D computer graphics & animation techniques are useful tools in this structure visualization process, and offer advantages over standard indexing and tables of contents. The mapping of an academic websites can be compared to maps of transportation systems. The sitemap can assist in visualizing the routes or channels of information a user may take, and their relationship with the rest of the information system. 3-D techniques can be used to map user paths of interaction within a site, and therefore help the designer understand the needs of the user, and how best to improve the dissemination of information to that user and similar users in the same category or channel. An example of this is researching the surfing and browsing habits of students in the Ohio State College of the Arts website and trying to improve their experience with the site by developing a specific 'students' channel of information. 3-D mapping techniques could be used to compare the designer's intended routes of navigation through the site with those interaction paths taken by actual users. This user interaction information would come from questionnaires, interviews, surveys, and focus groups with the College of the Arts user groups that include students, faculty, staff, alumni, and research partners. By visualizing the designers intended routes of interaction with those of actual user scenarios the 3-D sitemap can be used as an effective tool for improving the structure of the site, planning new additions. The practical aspect of this project to support the hypothesis would be the development of a three-dimensional sitemap for the college of the arts and its departments comparing different user paths of interaction with those of intended navigation

- Designers intended routes of interaction in the site
- VS.
- Paths of interaction from actual user scenarios

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channels. This 3-D visualization will be beneficial to future designers at the College of the Arts in planning and development of this arts related academic organization's site structure.

Research References:

- User-centered design research methodologies from the Design 786 class with Dr. Liz Sanders from Sonic Rim.
- Knowledge gained about student and faculty user groups use of Virtual communication technologies from the Design 786 class.
- References from bibliography and related websites about 3-D Website Structure Visualization.

Typical Phases of Concept Development (with visuals):

- Phase 1) College of the Arts Website
 - background history of the site development
- Phase 2) Arts Related Academic Websites in General
 - to benefit more than just the OSU College of the Arts
- Phase 3)Arts Websites 3-D Mapping Techniques for Planning and Development (focus of thesis)
 - thesis project focus that is possible to accomplish in 2-3 years

Explanation of Preliminary Concepts (with visuals):

- Website Cartography Background
 - website mapping as compared to transportation maps, metaphors and analogies.
- Techniques for Arts Related Organization Websites
 - Methods of 3-D Site mapping
- Preliminary Concept Visuals and Sitemaps
 - OSUarts two-dimensional sitemap
 - College of the Arts VRML sitemap

Efforts of Evaluation:

- Research and evaluation
 - Formulation of a research plan to evaluate current users paths of interaction with the OSUarts site, and generate new ideas for user channels and website structure.

 - The user interaction information would come from questionnaires, interviews, surveys, and focus groups and other research methods learned in the Design 786 course conducted with the College of the Arts user groups that include students, faculty, staff, alumni, and research partners.

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Bibliography:

*3-D Sitemap Visualization Methods

<http://www.dynamicdiagrams.com/>

•Website and Internet Cartography

<http://www.cybergeography.com/atlas/atlas.html>

•Mapping user interaction and navigation history

<http://www.cybergeography.com/atlas/surf.html>

•"Using Graphic History in Browsing the World Wide Web"

<http://www.w3j.com/1/ayers.270/paper/270.html>

•"WebMap - A Graphical Hypertext Navigation Tool"

[http://www.tm.informatik.uni-](http://www.tm.informatik.uni-frankfurt.de/~doemel/Papers/WWWFall94/www-fall94.html)

[frankfurt.de/~doemel/Papers/WWWFall94/www-fall94.html](http://www.tm.informatik.uni-frankfurt.de/~doemel/Papers/WWWFall94/www-fall94.html)

•"WebPath - A three-dimensional Web History"

<http://www.comp.lancs.ac.uk/computing/users/gbs/webpath/webpath.html>

•"State of the Art Review on Hypermedia Issues And Applications"

http://www.csi.uottawa.ca/~dduchier/misc/hypertext_review/

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Preliminary Thesis Report —○ Research References:

Instructor: Reinhart Butter
Advisors: Susan Roth, David Bull

Possible
Co-advisors: R.Brian Stone
Wayne Carlson
Liz Sanders

Key Terms:

• *User* – a person who uses or has an interest in using the academic website.

• *User Group* – a category of users based on similar demographics and lifestyles. In academic websites these groups may include students, faculty, staff, alumni, and research partners.

Key Terms:

• *User Path of Interaction* – a visual representation of how a specific user might navigate the structure of the website when seeking a certain kind of information. Each path of interaction is based on a specific user *Scenario* which describes who the user is and what information they are seeking.

• *User Profile* – describes who the user is in terms of lifestyle and demographics.

• *Situation* – the search for a specific kind of information. Different users may approach finding the same information in different ways based on their *User Profile*.

• *Channel* – a section of the website personalized for a specific category of users. The information will be organized to fit the user's way of thinking, language, and thought processes. May be sub-divided into sub-channels for more specific groups of users.

• User-centered design research methodologies from the Design 786 class with Dr. Liz Sanders from Sonic Rim.

Brainstorming sessions, literature searches, focus groups, image & interface collage kit sessions, surveys, questionnaires, interviews.

• Knowledge gained about student and faculty user groups use of Virtual communication technologies from the Design 786 class.

The use of virtual communication technologies such as e-mail, discussion groups, and chat rooms varies with age, occupation, and lifestyle. Many people felt that e-mail was a more useful tool than chat-rooms. Discussion groups that address the needs and questions of specific user groups might be a beneficial addition to the user group channels in the College of the Arts website.

• References from bibliography and related websites about 3-D Website Structure Visualization.

The world wide web was naturally a great resource of information about the topic of cartography and mapping for websites. Lists of research papers done on this subject were found at cybergeography.com and dynamicdiagrams.com. These papers supported a lot of the theories that I was already considering. One of the most useful was by Paul Kahn of dynamicdiagrams.com. His paper titled "Mapping Websites: Planning Diagrams to Site Maps" outlined how to both visualize existing websites and plan for new 'information systems'. There are two main types of sitemaps mentioned: hand made maps and data-driven maps. Data-driven sitemaps and generated automatically by software on the webserver. Both kinds can be useful in as visualization tools for site planning and development. "Designing Information Architecture for Web Publishing" is another paper by Paul Kahn which describes how to implement the structure of the sitemap, into a functional web architecture.

Phases of Concept Development (with visuals):

• Phase 1) College of the Arts Website

-background history of the site development

At first I wanted to design the College of the Arts website in general as my thesis and as part of my GRA position at the Arts Communications office. As I soon found out through the development of the college website two dimensional sitemap, this was way too broad a topic to do in 2-3 years, and needed to contribute more to the field of arts related academic website design in general.

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Usage of the term *Scenario* in this report –

- A profile describing who the user is and their lifestyle

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- A situation where they need a certain kind of information from the academic website.

- Phase 2) Arts Related Academic Websites in General

- to benefit more than just the OSU College of the Arts

In this stage of my concept development I wanted to provide a set of guidelines and recommendation which would benefit more than just the College of the Arts, design principles that could be utilized for many different arts related academic organizations. Again this topic was too broad and undefined to accomplish within the time-frame of graduate school.

- Phase 3)Arts Websites 3-D Mapping Techniques for Planning and Development (focus of thesis)

- thesis project focus that is possible to accomplish in 2-3 years

Finally I settled on the concept of website cartography and mapping for academic websites as a visualization tool for site planning and development. The practical aspect of this project to the support the hypothesis would be the development of a three-dimensional sitemap for the college of the arts and it's departments comparing different user paths of interaction with those of intended navigation channels. This 3-D visualization will be beneficial to future designers at the College of the Arts in planning and development of this arts related academic organization's site structure.

Explanation of Preliminary Concepts (with visuals):

Key Terms:

- Sitemap* – a visual flow chart or diagram showing the structure of a website, and possible interaction with in pages of the structure.

- 2-D Sitemap* – sitemap which is layed out in a two dimensional manner. Can be made interactive with expandable and colapsable branches in the hierarchy. Limited to a single 2-D viewpoint.

- 3-D Sitemap* – sitemap which is layed out in a three dimensional manner. Can be made interactive with expandable and colapsable branches in the hierarchy, and multiple camera viewpoints. Multiple views allow for more customization and flexibility in the visualization of the site for the designer and user groups.

- Website Cartography Background

- website mapping as compared to transportation maps, metaphors and analogies.

Around the world many transportation maps color-code their specific routes so the same technique could be useful in visually showing suggested paths of user interaction and navigation through the structure of an information system such as the College of the Arts website. One of the most famous transportation maps was done for the London Underground, which set the standard for other subway systems infographics in Berlin, Frankfurt, and New York. For someone new to these cities the transport maps are a great navigation tool. For a new user to the College of the Arts website a simular color-coded system might be beneficial for the navigation of the site.

- Techniques for Arts Related Organization Websites

- Methods of 3-D Site mapping

There are two main types of sitemaps mentioned: hand made maps and data-driven maps. Data-driven sitemaps and generated automatically by software on the webserver. Both kinds can be useful in as visualization tools for site planning and development. Examples of Data-Driven 3-D sitemaps can be found

Preliminary Thesis Report —○ at cybergeography.com which is an 'atlas of cyberspace'. The company called Dynamic Diagrams has done extensive research into using 3-D sitemaps for visualization, and has many example of work done for their clients at dynamicdiagrams.com. Paul Kahn is just one of many researchers working in this field.

•*Preliminary Concepts: Visuals and Sitemaps*

Mapping User Paths of Interaction

Problem Statement –

Many academic websites don't recognize the informational needs of their users. The site offer the same information to everyone, presented in the same way. Academic Jargon meant for faculty can be confusing to students. Designers of academic organization websites need a visualization tool to help them plan and develop channels specific to different user groups such as students, faculty, and alumni. Sitemaps are a possible solutions to the problem of understanding users interaction within an academic website.

Project Objectives –

- Study uses of 3-D visualization & animation techniques as applied to website cartography and mapping.
- Provide a useful structure visualization tool for designers of academic websites for use in planning and development.
- Better develop channels that meet specific user's needs, by visually charting user Scenarios, and user paths of interaction within a website.

Strategy –

- Define who the of the site users are in the College of the Arts website.
- Discover what each groups informational needs are.
- Development an interactive 3-D sitemap to map user paths of interaction within the site.
- Evaluate the site structure through user research.

The mapping of an academic websites can be compared to maps of transportation systems. The sitemap can assist in visualizing the routes or channels of information a user may take, and their relationship with the rest of the information system. 3-D techniques can be used to map user paths of interaction within a site, and therefore help the designer understand the needs of the user, and how best to improve the dissemination of information to that user and similar users in the same category or channel. In the case of the College of the Arts user groups include students, faculty, staff, alumni, and research partners. For the purpose of this thesis project the main groups to focus on will be alumni, students, and faculty.

Scenarios can be used to describe the interaction habits of typical users in each category. The scenario for a typical user of the website begins with a user profile defining who that user is in terms of lifestyle and demographics, and adds a situation where the user needs a certain kind of information from the academic website. For example, a prospective student interested in the College of the Arts wants to know about admissions information, and where to get academic counseling. Based on the student's user profile of being a prospective student and being new to the website and the College of the Arts in general the designer can be educated guesses on how this user would navigate the structure of the site. Testing of a prototype students channel of the site can reveal if the designers assumption of what this user might do, when searching for the information they need, is correct.

Each group of user can be sub-divided into more specific sub-groups. For example, the Students user group can be divided into prospective students, new student, current students, and students preparing to graduate. These groups can be further broken down into Undergraduate and Graduate, and then categorized by specific department, program, major, and specialization. Ideally it would be beneficial to get profiles and information seeking scenarios of students from each grade level in every major by conducting user research. By taking a broad sample of students across the college the designer can be to see information needs and patterns of seeking that information which are common across all student subcategories. The designer can also note important differences specific to certain departments and majors. For example,

Preliminary Thesis Report —○ information of a visual nature may be more important to students in Design and the Visual Arts than students in Music and the Performing Arts. By studying the informational needs of these user groups a designer can begin to develop channels for each, which information organized in a way personalized for that group. The channel may include sub-paths with information to more specific users in that channel category.

Visualizing user interaction through the complex set of channels and sub-divisions may be difficult for the designer without an interaction flowchart, a visual sitemap. Traditional tables of contents and indexes may work for printed books and can be useful to describe the hierarchy of an academic website's structure, but a more visual flow chart is needed to actually describe user paths of interaction within the site.

•*Preliminary Concepts: Visuals and Sitemaps*

Sitemaps as a Visualization Tool for Academic Website Planning

- Designers intended routes of interaction in the site
- VS.
- Paths of interaction from actual user scenarios

By visualizing the designer's intended routes of interaction with those of actual user scenarios the 3-D sitemap can be used as a effective tool for improving the structure of the site, planning new additions. The practical aspect of this project to the support the hypothesis would be the development of a three-dimensional sitemap for the college of the arts and it's departments comparing different user paths of interaction with those of intended navigation channels. This 3-D visualization will be beneficial to future designers at the College of the Arts in planning and development of this arts related academic organization's site structure.

-OSUarts two-dimensional sitemap

- Target Groups* for using Sitemaps as a visualization tool:
- Designers and Developers of Academic Websites as a tool for planning and development.
 - Users as a tool for navigation within the site.

The College of the Arts 2-D sitemap was first developed in the summer of 1999 and reflects the concept of channels for each user group, even though the current site does not yet have these channels available. The 2-D map will continue to evolve as a sketch for the 3-D version, and will display color coded paths of user interaction. Hopefully user channel prototype will develop from using the sitemaps as a development and planning tool to understand user interaction within the college website.

-College of the Arts VRML sitemap

This is my first attempt at putting my 3-D sitemap visualization ideas to form based on my research from literature on the subject and examples from the web.

The site has links to most of the important pages in the College of the Arts website structure, and can show the interaction paths of three user scenarios.

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Expected Outcomes –

- 3-D Sitemap visualization tool for the College of the Arts Website to be used by designers for planning and development.
- A set of guidelines for designing channels for different user groups such as Alumni, Faculty, and Students.
- Prototype channels developed for each user group.
- Documentation and guides for using the 3-D sitemap and a visualization tool for mapping user scenarios and paths of interaction within the site.
- recommendation for further research in this area.

These scenarios are of a prospective student, a member of the College of the Arts Alumni, and one of the Research Partners working with the college. To view each of these paths of user interaction the designer clicks one of the three buttons below the sitemap. The paths are color-coded, the alumni path is orange, the student's path is green, and the research partners' path is blue. The Alumni path is based on the scenario that an alum needs to find information from an online alumni newsletter. To get to this information the alum starts at the 'Home page', goes the 'Resources' section, and then finds 'Resources for Alumni'. In a scenario for a student who wants advising information, they may follow a different path. Instead of going to "Home > Resources > Resources for Students" the student may choose to go the route of "Home > Academics > Student Advising". This shows the importance to have alternative ways of accessing the same information, because all people may not think alike. In a scenario for a research partner the person may choose to follow the path of "Home > Resources > Resources for Research Partners" or they may go a alternative route of "Home > Research > Research Partners" to find the information they need. The designer can use multiple camera views to run through each of the steps in the user interaction path in an animated sequence. The College of the Arts 3-D sitemap was created using the 3-D Modeling and Animation software called MAYA by Alias/Wavefront. The links, multiple camera views for each step in a user scenario, and interactivity are set up in MAYA, and then exported into VRML which can be viewed by any web browser with the Cosmo Player plugin. The next technical step in the development of this prototype sitemap is how to create expandable/ colaspable branches of the structure so that the designers can choose the level of detail or abstraction presented in the map. Also it would be nice to texture map thumbnails of each page onto each of the nodes in the sitemap.

Efforts of Evaluation:

- Research and evaluation
 - Formulation of a research plan to evaluate current users paths of interaction with the OSUarts site, and generate new ideas for user channels and website structure.

The research plan will include a quarter to quarter overview of steps in the development process of the College of the Arts 3-D Sitemap. This will be a plan for both the generative research that needs to be done to develop the prototype sitemap, and the user testing research that will be needed to evaluate it.

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-The user interaction information would come from questionnaires, interviews, surveys, and focus groups and other research methods learned in the Design 786 course conducted with the College of the Arts user groups that include students, faculty, staff, alumni, and research partners.

Questionnaires and Surveys will be done to discover what the informational needs of each user group are. Focus groups and personal interviews will be done to evaluate the prototype. In addition, an outline opinion survey will be developed to ask users how well they found the information they were looking for. A simplified sitemap for use as a navigation tool will be introduced for using testing. Users will be shown the interaction paths of others in their category and asked if this information is accurate and applied to their scenario. It may be possible to collect some user interaction information automatically. The Advanced Computing Center for the Arts and Design which hosts the College of the Arts website helps statistics on how many hits each page in the website gets per hour, day, week, and month. If a page is not getting a lot of hits this may mean the users are not finding it easily. This would suggest that the site structure needs to be changed in that use channel to allow the user to find the information they are looking for. Another solution for automatically collecting user data, would be to require users to log-in with their name and information when they use their respective channels in the College of the Arts website. A CGI program on the webserver would track their movement and navigation within the site, and keep a detailed record of which pages they visited, and a history of which pages they went to first. If someone when done one path and then had to backtrack to another that might mean that the way the channel is structured is confusing to them. It would be necessary to do further research with user surveys and focus groups to see if this is really the case.

Spring Quarter Summary –

- narrowed the focus of my thesis topic to a more possible project.

- continued print and electronic literature review.

- reviewed websites about site mapping and cartography.

- continued development of the College of the Arts website.

- produced a prototype VRML sitemap to demonstrate the concept of 3-D sitemaps as a visualization and planning tool.

- Contributions to the field of academic website and interactive media design

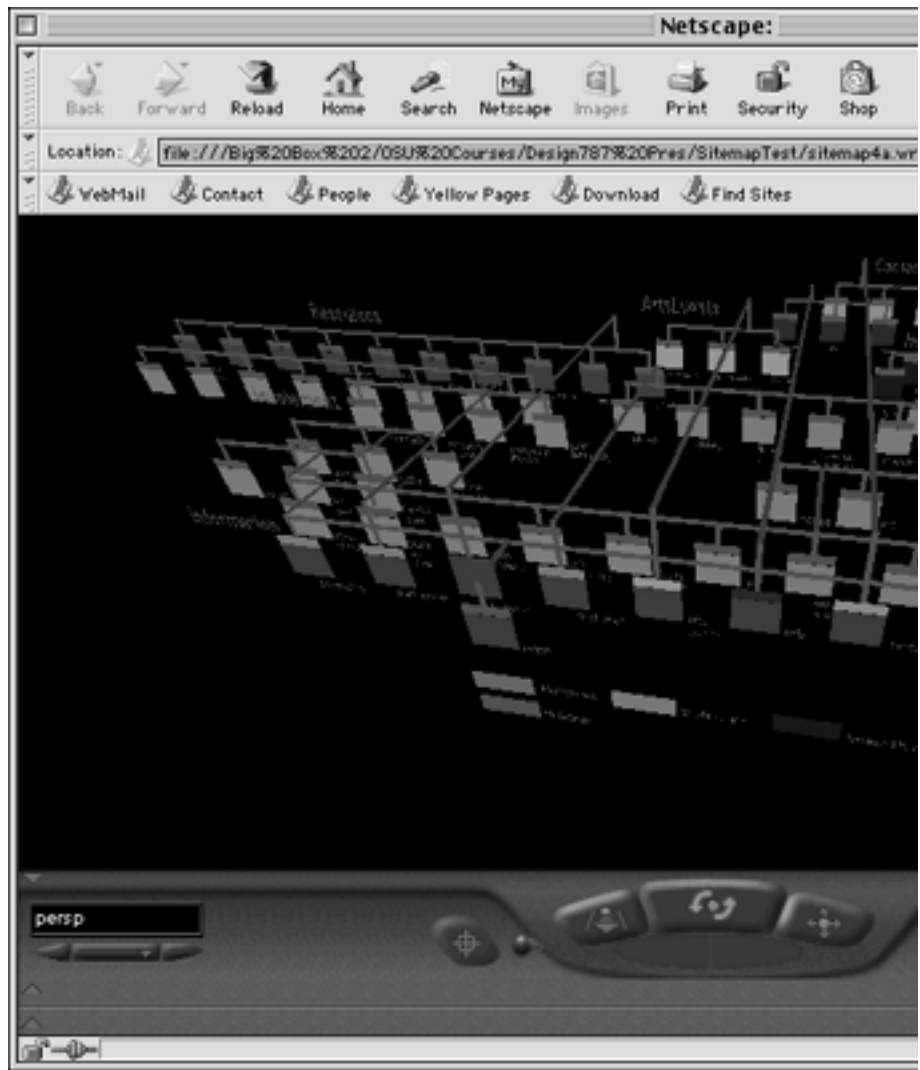
- A 3-D Sitemap visualization tool for to be used by designers for planning and development.

- A set of guidelines for designing channels for different user groups such as Alumni, Faculty, and Students.

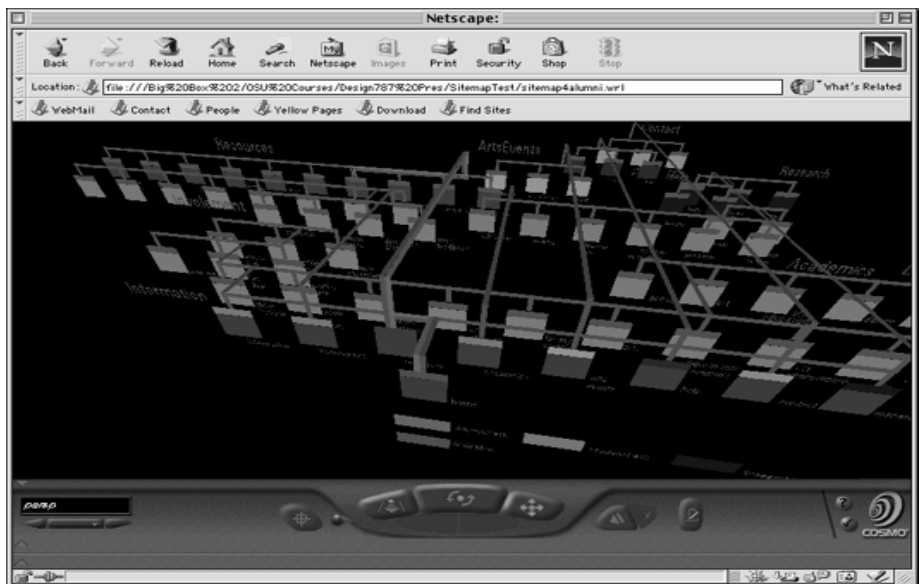
- Documentation and guides for using the 3-D sitemap and a visualization tool for mapping user scenarios and paths of interaction within the site.

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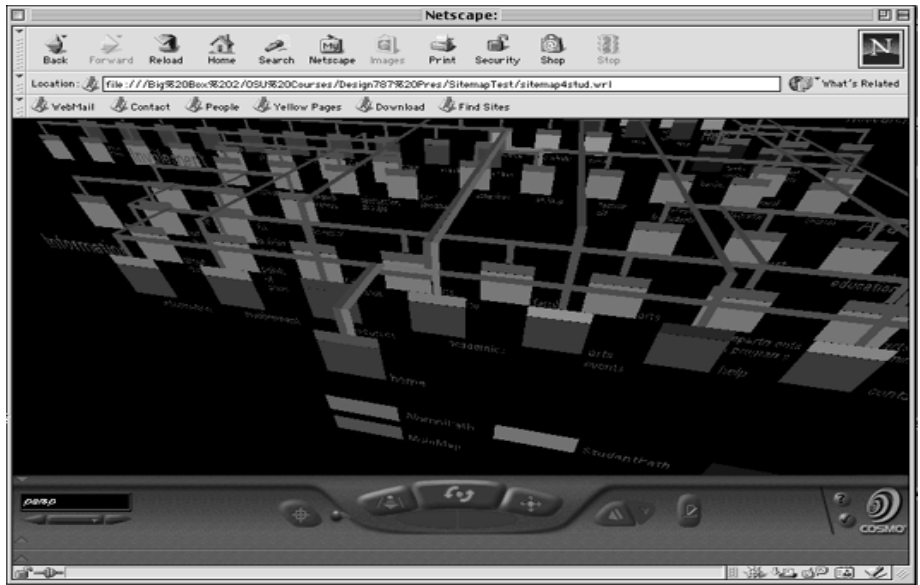
General Overview of VRML Sitemap with User Scenario Buttons at the bottom (color-coded)



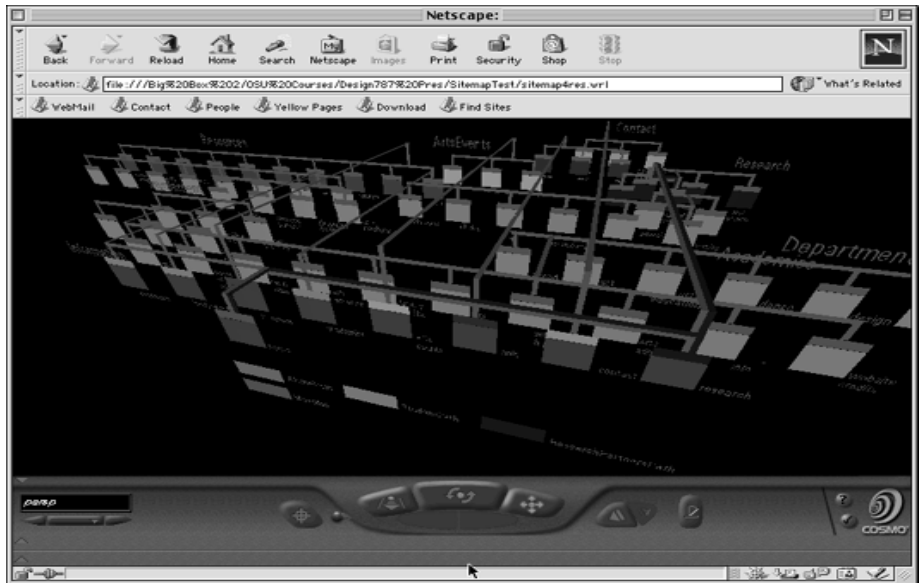
Aumni User Interaction Path - Orange



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Students User Interaction Path - Green



Research Partners User Interaction Path - Blue

Project Title: Visualization of Academic Website Structure through the use of 3-D Computer Graphics & Animation Techniques for the Purpose of Site Planning, Development, and Navigation in the Design of Websites for Arts Related Academic Organizations.

for more images from this report see the Design 787 HTML Presentation at: <http://www.cgrg.ohio-state.edu/~jgladden/Design787>

1) References from printed Literature

A) Books

Distance Education:

Burgess, William E., The Oryx Guide to Distance Learning. New York: Oryx Press, 1994.

This comprehensive guide provides information on 298 institutions offering over 1,500 media-assisted courses for which academic credit can be earned. It discusses the effective use of electronic media in an academic forum.

Flagg, Barbara N. Formative Evaluation for Educational Technologies. Lawrence Erlbaum Associates, Publishers: Hillsdale, New Jersey, 1990.

Helps the the designer of a new product during the early stages of development increase the likelihood that the final product will achieve it's stated goals. The interface and interaction of a website can be defined as a product in which formative evaluation can be helpful.

Fleming, M., and Levie, H. H. Instructional message design: Principles from the behavioral and cognitive sciences. Englewood Cliffs, NJ: Educational Technology, 1993.

Online Education and Learning:

Borrett, Edward. Sociomedia: Multimedia, Hypermedia, and the Social Construction of Knowledge. MIT Press: Cambridge, 1995.

Examines the use of integrated multimedia to support social and collaborative research, learning, and instruction in the university environment. A good resource for learning about designing hypermedia for large, diverse academic organizations like the college of the arts.

Forsyth, Ian, Teaching and Learning Materials and the Internet. London: Kogan Page Limited, 1996.

This book examines the educational and administrative considerations of offering a course, course materials or course delivery via the Internet.

Garner, Ruth, and Mark G. Gillingham, Internet Communication in Six Classrooms. Mahwah: Lawrence Erlbaum Associates, Inc., 1996.

This book looks at the Internet and the classroom as it relates to communication and social activity. Six different case studies are discussed, showing examples of this technology as informative, entertaining and persuasive.

Harasim, Linda. Learning networks : a field guide to teaching and learning online. Cambridge, Mass. : MIT Press, c1995.

Heflich, David A. The Impact of Online Technology on Teaching and Learning: Attitudes and Ideas of Educators in the Field. 1996.

Preliminary Thesis Report —○ Heide, Ann, and Linda Stilborne, The Teacher's Complete & Easy Guide to the Internet. Toronto: Trifolium Books, Inc., 1996.

An explanation of issues related to educators using the Internet as an effective tool. Examples dealing with curriculum, special projects, library access and controversial subjects are cited.

Hodgson, Viven E, editor. Beyond distance teaching towards open learning. Philadelphia : Open University Press [for] the Society for Research into Higher Education, 1987.

Hoffman, Bob. Teaching and Learning Online: Tools, Templates, and Training. 1998.

Human-Computer Interface & Cognition Studies:

Barry, Ann Marie Seward. Visual Intelligence: Perception, Image and Manipulation in Visual Communication. State University of New York Press: Albany, 1997.

Dempsey, J.V., and Sales, G. Interactive instruction and feedback. Educational Technology: Englewood Cliffs, NJ, 1993.

Laurel, Brenda ed. The Art of Human-Computer Interface Design. Addison-Wesley: Reading, MA: , 1990.

Surveys the many philosophies, design methods, and technological approaches that have evolved. Includes essays from interface design specialists.

Mclunhan, Marshall. Understanding Media: the Extensions of Man. MIT Press: Cambridge, 1998.

This book from the MIT Media Lab redefines the word media. It covers emerging technologies in mass media and discusses the concept of the 'global village'.

Newberry, Betsy. Designer's Guide to Marketing. North Light Books: Cincinnati, 1997.

Overview of marketing concepts and principals useful for designers. Marketing techniques can be used to understand the users of websites of large organizations.

Design for the World Wide Web:

Elderbrock, David. Producing Web Hits. 1997.

Producing Web Hits by David Elderbrock describes how to plan, evaluate, and execute a web presence for many types of organizations. It discusses thematic and audio-visual identity systems for a successful website. This book can help me develop a marketing or promotion strategy for the college's web presence.

Mok, Clement, Designing Business. San Jose: Adobe Press, 1996.

Designing Business by Clement Mok looks at multimedia and website development from a professional graphic designer's perspective. It's a look at using technological innovations to develop usable products and services, without being distracted by the technology itself. Using case studies, the book

Preliminary Thesis Report —○ follows a progression from problem to solution showing how the links between business and design are becoming more evident. The text asserts that the role of the designer is changing, design, business and technology are merging into one informational discipline. I feel that the information in this book is related to all large diverse organizations and not exclusively corporations.

Siegel, David. Creating Killer Web Sites. Hayden Books, Indianapolis 1996.
<http://www.killersites.com>

Rosenfeld, Louis and Peter Morville. Information Architecture for the World Wide Web. O'Reilly & associates, 1998.

Techniques and processes for streamlining usability for complex websites is covered in Information Architecture for the World Wide Web by Louis Rosenfeld. It discusses ways to design websites for large organizations like the College of the Arts, which have diverse departments and many levels of hierarchy. The text talks about labeling the content of the site in the language of its users and organizing the structure in way that can be easily understood. The authors examine web design as architecture, considering aspects such as structure, connections, and the user experience. It emphasizes the overall design of websites, providing clear navigation and giving a cohesive look.

Vitale, Joseph G., Cyber Writing: How to Promote Your Product or Service Online. New York: AMACOM, 1997.

This book examines positive and negative responses to written material on the Internet. It examines the importance of clarity, economy and personality in written form.

Weinman, Lynda. Designing Web Graphics. New Riders, 1996.

Helps designers understand the techniques needed for adding graphics and media to web pages. Covers how to prepare images for the web with guidance from case studies.

Wilbur, Peter. Information Graphics. Van Nostrand Reinhold: New York, 1989.

Design for Multimedia:

Bromley, Hank Editor. Education/Technology/Power: Educational Computing and Social Practice. State University of New York Press: Albany, 1995.

Lopuck, Lisa. Designing Multimedia. 1996.

The text Designing Multimedia by Lisa Lopuck takes a look at the many forms that the structure of interactive projects can take. Some methods of organizing the information in a Multimedia project include: Hierarchy, Linearity, Multi-track, Interactive Stories, Modularity, Construction and Simulation. Different types of organizations may appeal to the thought processes of different users.

Heller, Steven and Daniel Drennan, The Digital Designer. New York: Watson-Guptill, 1997.

This book takes a critical analysis of the definition of a graphic designer as the influx of interactive multi media affects our visual language. The authors try to answer questions on how will designers and educators deal with the change that this digital medium has brought forth and how schools are trying to integrate this new medium into traditional design curriculum.

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Oliver, Richard and Bob Lotton. Understanding Hypermedia 2.000: Multimedia Origins, Internet Futures. Phaiden Press Ltd.: New York, 1992.

Provides an introduction to new media and covers the ability of users of multimedia to create their own experience and make their own choices.

Society & Generation Studies:

Coupland, Douglas. Generation X: Tales for an Accelerated Culture. St. Martin's Press: New York, 1991.

Studies the vast generation of people born between the early 60s and 70s and shows how they differ from other generations. Discusses the hopes and aspirations of this accelerated culture.

Leeson, Lynn Hershman Editor. Clicking In: Hot links to a Digital culture. Bay Press: Seattle, 1996.

Considers the long term implications of the new technology that is being developed today.

Ritchie, Karen. Marketing to Generation X. Lexington Books, 1995.

Examines the many differences between "Baby Boomers" and Generation X form a marketing and advertising context.

Rushkoff, Douglas. Playing the Future: What We Can Learn from Digital Kids. Riverhead Books: New York, 1999.

Focuses on the mindset of the next generation of digital kids, how their culture is different form previous generations.

Tapscott, don. Growing Up Digital: The rise of the Net Generation. McGrawn-Hill: New York ,1998.

Talks about the N-Generation mindset, how this group works, learns, and consumes, how they are different from Generation X and Baby Boomers.

Art & Technology:

Hide, Don. Philosophy of Technology: An Introduction. Paragon House: New York, 1993.

Discusses technology's impact on and the Implications of technology on the social, ethical, political, and cultural dimensions of our world.

Hotzman, Steven r. Digital Mosaics: the Aesthetics of Cyberspace. Simon & Schuster: New York, 1997.

Reviews the creation of digital art, and how the computer can add a new dimension to traditional art forms and the opportunities in artistic expression that it offers. Examines the potential of the internet as an artistic tool to be explored.

Laurel, Brenda. Computers as Theatre. Addison-Wesley Publishing Company: Reading Mass., 1993.

The views expressed in this book take a fresh look at society's imperfect relationships with computers and technology. It promotes a new perspectives on

Preliminary Thesis Report —○ the development of modern communications and technology.
Lovejoy, Margot. Postmodern Currents: Art and Artists in the Age of Electronic Media. 2nd Edition. Prentice Hall: Upper Sadder River, NJ, 1997.

Explores the growing impact of the internet on the aesthetic experience. Introduces major computer artists and trends.

Research & Documentation:

Publication Manual: for the American Psychological Association. Fourth Edition. American. Psychological Association: Washington, D.C., 1994.

Written for professionals who study the behavioral sciences which can be applied to human-computer interface design. Provides guidance for content organization, expressions of ideas, editorials styles, and using mathematical copy, tables and figures.

Turahian, Kate L. A Manual for Writers of Term Papers, Theses, and Dissertations. The University of Chicago Press: Chicago, 1987.

Provides examples of an annotated bibliography. The text is more concise and readable than other style manuals.

Tufte, Edward R. Envisioning Information. Cheshire, CT: Graphics Press , 1990.

Tufte, Edward R. The Visual Display of Quantitative Information. Graphics Press: Cheshire, CT: , 1983.

Wilbur, Peter. Information Graphics. Van Nostrand Reinhold: New York, 1989.

B) Periodicals

Bull, David and Paul Nini. "Communication Design: Strategic Visual Identification for Diverse Organizations". Design Management Journal, Autumn 1999, p1.

Serves as a model for design management, design process, and visual language development in developing identity system for diverse organizations.

Cross, Lisa, "Internet to Emerge as Top Info Source" Graphic Arts Monthly, Jan97, Vol. 69 Issue 1, p20.

Focuses on the results of the survey on proposing that the Internet will become the top source of information in the United States by the year 2000. It compares the use of television versus the Internet as primary sources for delivering information.

Greenhalgh, J.B., "Using the Internet: Concept to Classroom." T H E Journal, Sept97, p15.

An examination of the application of the Internet used in the classroom. Sample projects are described and increased training needs in the area of computing are discussed.

Gregory, Diane C., "Art Education Reform and Interactive Integrated Media." Art Education, May95, Vol. 48 Issue 3, p6.

Argues that technological advances will require a transformation of the educational community. Takes a close look at Yale University's "Perseus" project.

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Schrum, Lynne and Theodore A. Lamb, "Computer Networks as Instructional and Collaborative Distance Learning Environments." *Educational Technology*, July/Aug97, Vol. 37 Issue 4, p26.

This article focuses on the advantages of using the Internet as an instructional tool and the types of information currently available.

C) Theses and Dissertations:

Appachu, Kavita. Resources Discovery with Search Engines on the World Wide Web (WWW): User Classification Based on Search Style. 1998.

By reviewing this thesis project I can better define the types of users visiting the college of the arts website based on their type of search style.

Gopalan, Nagarajan. WorldInfo: an Information Resource for International Business Accessible Through the World Wide Web. 1997.

This thesis can provide methods for sharing information over the web in large, diverse organizations.

Limmer, Ingrid. Designer's Intentions versus users' Interpretations of Web Sites - A Study with an Emphasis on Semantics 1997.

The thesis project by Ingrid Limmer from 1997, Designer's Intentions versus users' Interpretations of Web Sites - A Study with an Emphasis on Semantics, is useful for my project because it gives an overview of the history of the world wide web and explains the importance of knowing what the user wants. The project proposes ways to study and evaluate how users evaluate website and how designers can better design the sites with the user in mind.

Stone, R. Brian. Design education, New Media, and Distance Learning: An interactive Multimedia in Design History 1999.

R. Brian Stone's Thesis project, Design education, New Media, and Distance Learning: An interactive Multimedia in Design History explores ways to use new media to enhance design education. The research techniques use in this project can be applied to evaluate the effectiveness of the College of the Arts website and help make it a better on-line experience for the user. Brian Stone's CD-ROM design methods can be easily transfers to designing for web-based media in the case of the college website.

3) References from electronic Literature (Internet)

Distance Learning Websites:

Duquesne University Distance Learning
<http://www.duq.edu/distancelearning/browsertest/distance.html>

The Ohio State University Master Plan
Long Range Concept Plan
Distance Learning Paragraph 1.3
<http://www.apo.ohio-state.edu/mp/mpv2c1.htm#b13>

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TELRL
Technology Enhanced Learning and Research
<http://telr.ohio-state.edu/>

Research & Documentation Websites:

ProQuest: Digital Dissertations
<http://www.lib.umi.com/dissertations/main>

The Ohio State University Libraries
<http://www.lib.ohio-state.edu/>

Ohio State College Homepages for Evaluation:

The Ohio State University - Colleges and Schools
<http://www.acs.ohio-state.edu/academics/>

Industrial, Welding and Systems Engineering at The Ohio State University
[www-iwse.eng.ohio-state.edu](http://www.iwse.eng.ohio-state.edu)

Fisher College of Business
<http://www.cob.ohio-state.edu/>

Department of Marketing
<http://www.cob.ohio-state.edu/~mkt/welcome/index.htm>

The Ohio State University College of Medicine & Public Health
<http://www.med.ohio-state.edu/>

The Ohio State University College of Mathematical and Physical Sciences
<http://www.mps.ohio-state.edu/>

College of Humanities
<http://www.cohums.ohio-state.edu/design/contain1.htm>

Ohio State University College of Food, Agr. and Env. Sciences
<http://cfaes.ohio-state.edu/>

College of Engineering at The Ohio State University
<http://www.eng.ohio-state.edu/>

College of Education
<http://coe.ohio-state.edu/>

Knowlton School of Architecture
<http://www.arch.ohio-state.edu/>

Computers and Hypermedia:

MIT Media Lab.
<http://www.arch.ohio-state.edu/>