APPROVAL PAGE

The undersigned, appointed by the dean of Humanities and Social Science, have examined the thesis, project, or internship titled

THE WEB FOR COMMUNICATION PROFESSIONALS
Presented by Chris Hall

A candidate for the Master of Arts in Professional Communication, and hereby certify that, in their opinion, it is worthy of acceptance.

L. Paul Husselbee, Chair of Committee

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THE WEB FOR COMMUNICATION PROFESSIONALS

A Thesis submitted to Southern Utah University

In partial fulfillment of the requirements for the degree of

Master of Arts in Professional Communication

April 2012

By

Chris Hall

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THE WEB FOR COMMUNICATION PROFESSIONALS

By

Chris Hall

Dr. L. Paul Husselbee, Capstone Committee Chair

Abstract

The World Wide Web is taking an increasingly prominent role in the lives of communication professionals. Students entering the field of communication will undoubtedly be involved in web projects in their careers. The principal objective of this capstone project was to create a graduate-level course for communications students entering the field of communication that provides the web knowledge they will need to succeed in web-related projects in the workforce. The course focuses on web design for communication professionals. Students will be exposed to terminology and methodology for producing web media in a professional communication environment. Course materials include a workbook, a syllabus, a weekly required reading guide, assignments, review questions, and a grading rubric (for instructors). Collectively, these materials will help students accomplish three instructional objectives:

1. Understand the terminology required to participate effectively in web projects
2. Learn best practices for developing web projects
3. Apply the scientific approach to usability in web projects

Acknowledgements

This project is dedicated first and foremost to Lorna, who has offered endless support and encouragement in my academic endeavors. Her confidence in me has been the catalyst that has transformed my dreams into reality. I am very grateful to my parents, who always taught me the importance of education and believed I could succeed. I am grateful to many instructors at SUU for their hard work and attention, and especially to Dr. Husselbee and Dr. Barton for their help with this project. And finally, I would like to acknowledge my high school academic counselor who nearly persuaded me that I lacked the intelligence to go to college and that the highest level of education I could hope for was a high school diploma. I hope she has found another job.

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Introduction

The objectives for this capstone project were to (1) fulfill the capstone requirement for the Master of Arts in Professional Communication degree, (2) learn how to design a college-level course, and (3) create a body of work that will prepare students entering the field of professional communication for their eventual involvement in web projects. I believe that each of these objectives has been met, and the knowledge and experience I have gained as a result of this endeavor are of great value to me. The project also helped me start down the path of accomplishing several other personal goals including becoming a published author, learning print design and teaching students about the web. I believe that my unique background, coupled with these interests positioned me well to create this course. In my professional experience, I have worked as a web designer, ActionScript programmer, creative director and marketing manager. Through each of these roles I have gained an intimate knowledge of the things that are important for communication professionals to understand about the web. This experience, the intended learning outcomes and a lengthy examination of comparable courses were all key factors affecting which topics I decided to include in the course.

At the center of my work for this course lies its accompanying workbook, "The Web for Communication Professionals," which I wrote. This book is meant to provide the same information as weekly class lectures if the class were given on-campus. The book's chapters follow other course module content week-by-week teaching students course material. The final workbook contains more than 50,000 words and is the product of nearly 400 hours of work. In addition to the required reading in the workbook, students are also required to read from the textbook "InterACT with Web Standards." While "The Web for Communication Professionals" provides a broader understanding of the selected topics, "InterACT with Web Standards" offers a

more detailed technical look at how specific tasks are accomplished. For instance, in the course module explaining web presentation techniques, the workbook explains what Cascading Style Sheets are and how they fit into the broader picture of web design and development, while the required reading in the "InterACT with Web Standards" book walks through the actual code used to create a Cascading Style Sheet.

The course also requires weekly assignments, including writing a blog post and answering a series of review questions based on the reading in the workbook for that week. One of the leaning objectives requires students to learn the practical application of web design. To achieve this, students are asked to participate in hands-on learning activities that include working directly with graphic design programs, web servers and code editors. After taking this course, students should know how to create their own websites from scratch.

While time constraints unfortunately did not permit formal research to determine how effective the final course content might be, I did find the time to introduce a small, informal test group comprised of professional marketing managers, graphic designers and web designers to the course material, generating excellent feedback. Many felt that the content provided new and valuable information for their current positions and would have helped them be far more effective in their jobs had they received the information in school. While unofficial, this feedback was encouraging, and I hope that this course material will be used in a real course at SUU in the future.

Degree Applied to Capstone Project

Each course in my degree at SUU taught me skills that proved useful in the creation of this course. Because each of my courses was taught online via distance education, I also learned valuable techniques for teaching and learning online. The most important thing I learned about

online learning is that clear, constant communication is essential. Distance learners can feel disconnected from their programs and instructors because of the physical distance between themselves and those with whom they are interacting. Even though an on-site student's typical day may not include any direct interaction with the instructor, being on campus and attending classes provides students with a comfort level that they are aware of what's happening. To compensate for this comfort deficit, it is important for distance-learning students to proactively ask questions and for instructors to quickly and clearly respond. To avoid confusion, the instructor should set proper expectations on this point at the beginning of the course.

I believe that the courses that contributed most to my project were the three research courses offered by the program: Qualitative Applications for Communication Research with Dr. Kevin Stein, Quantitative Applications for Communication Research with Dr. Paul Husselbee, and Applied Audience & Mass Communication Research with Dr. Lionel Grady. These courses taught me the skills I would need to properly gather research and document and interpret findings. Dr. Husselbee's course in particular helped me learn how to "read between the lines," taking all available information into account when interpreting research data to understand the true story the numbers tell. This is particularly applicable to web analytics, where many things can affect the number of hits a website gets. It is only in diving into the numbers that the truth is learned. These research courses also helped influence my decision to include an understanding of the scientific method as one of the intended learning outcomes of the course. Too often, web usability is seen as subjective, and design decisions are made according to what the designer or client thinks looks best. Achievements of the website's goals are left to chance. Proper research and application of the scientific method offers a better way. By hypothesizing, testing, documenting and retesting web designers can achieve a solid foundation for design decision-

making that will help the companies they work for succeed.

The Professional Writing and Communication course I took from Dr. Art Challis had obvious implications for writing the workbook. I was able to apply advanced research and writing techniques that doubtlessly impacted the quality of my work. It was particularly beneficial to be exposed to the different narrative styles used in business and academic writing and apply the ones that worked best. Finally, while completing my Individual Graduate Research course with Dr. Jezreel Kang-Graham, I documented the process of redesigning a web application. This was particularly helpful in creating my workbook because it helped me identify key topics that were included in the course content. Even though I have gone though the process of redesigning applications many times in my professional experience, it was very helpful to document and analyze the procedure because I used the same technique to write the workbook.

Course Relevance to Communication Professionals

Given our increasingly digitally literate audiences and the rapid growth of new communication technologies, it is vital for communication graduates entering the workforce to have a solid understanding of digital media production. The Obama Administration's launch of an online digital literacy portal, digitalliteracy.gov, demonstrates the importance of digital literacy in today's economy. According to research:

- Ninety-six percent of working Americans use new communications technologies as part of their daily lives, while sixty-two percent of working Americans use the Internet as an integral part of their jobs (Jones & Madden, 2008).
- Between 1998 and 2008, the number of domestic IT jobs grew by 26 percent, four times faster than U.S. employment as a whole. By 2018, IT employment is expected to grow by

another 22 percent (U.S. Department of Commerce Internet Policy Task Force, 2010).

- According to one estimate, as of 2009, advertising-supported Internet services directly or indirectly employed three million Americans, 1.2 million of whom hold jobs that did not exist two decades ago (Interactive Advertising Bureau, 2009).

Digital literacy is also increasingly important in social participation and activism, especially in youth. People born after 1980 get 59% of their news from the Internet (Palser, 2010). For youth, social media activity is often the starting point of political activism (Kerwin, 2010). Many youth consider activism through social media as way of shaping their social identities (Dunbar-Hester, 2010). Social Media via mobile phone among Iranian youth has recently become popular as a way for youth to express their social needs and represent their own culture (Niknam, 2010).

To better equip SUU students for digital media-related demands they will likely encounter in today's digital workforce, this course will teach students the expertise needed to contribute meaningfully to web projects that accomplish goals. From research to planning to production and assessment, students will get a broad view of how to implement effective web design. They will also be introduced to tools and skills required to create a website themselves, using current web standards.

Despite being immersed in the Internet and new communication technologies, many communication professionals feel alienated in projects that deal with Internet technology. This feeling is due in part to a simple lack of understanding of the terminology. This course will help students become more effective Internet communicators by stripping away some of the unknown and giving them the confidence to create effective web media. After completing the course, students should be able to have an intelligent conversation with IT professionals in order to

accomplish project goals. Understanding the code that makes up the web is no different than the paper and ink that makes up a printing press. This course will give students the technical foundation needed to get started developing and deploying web projects without the help of designers or developers. Today's communication professionals live and work in an age when many people know basic web design principles. Unfortunately, very few take scientific approaches to web design. Students will learn that the scientific method can and should be applied to web design. From data mining and analytics to lab-based usability studies and one-on-one interviews, this course will help students discover the art and science of qualifying and quantifying design decisions.

Literature Review

According to estimates, 80 million students will be enrolled in online classes by the year 2025 (Hosie, and Schibeci, 2005 citing Bell, Bush, Nicholson, O'Brien, and Tran, 2002). Online courses carry distinct advantages and challenges for both students and teachers. The concept of instructor immediacy was initially documented by Meharabian (1969) as behaviors that enhance closeness and nonverbal interaction with another. Gorham (1988) extended the concept to include verbal interaction that increased psychological closeness between teachers and students. Verbal immediacy includes the frequent use of student name, encouragement of discussion and following up on student-initiated comments, encouraging future contact with students, the use of humor and sharing of personal examples. Nonverbal immediacy includes smiling, eye contact, vocal expressiveness, open gestures and body movement behaviors by the instructor. Instructors displaying immediacy often encourage students to value learning itself, a quality that has been found to enhance cognitive learning (Rodriquez, Plax & Kearney 1996)

One challenge in online learning is presented by the suggested lack of instructional

interaction and teacher-student immediacy. Without meeting several hours per week with the class and instructor in person, students can feel disconnected and grades suffer (Hutchins, 2003). Conaway, Easton & Schmidt (2005) found that if a level of learner-to-learner communication takes place, whether it is in online group chats, forums, or working on group projects together, immediacy is increased and grades are improved. However, it is important to note that the results of the study suggest that students will not automatically engage in proactive communication unless the instructor builds a learning community and transfers interactive roles to the students themselves. Research by Russo & Benson (2003) and Arbaugh (2000) also found that students' satisfaction with their own learning was dependent on the student's perceptions of the presence of other students in the class. This concept is sometimes referred to as creating a "Community of Learners." Chinnappan (2006, as cited in Littleton, and Light, 1998) suggests that "ensuing collaboration with other members increases the ability for learners to critique their own idiosyncratic perceptions and revise conceptions in the light of new information and alternative perspectives from their colleagues" (p. 356). Using a technique called "scaffolding," instructors can achieve a community of learners by creating a structure for learner-to-learner communication and early in the course initiating group interaction (Nagel, Blignaut, and Cronje, 2007). As the course progresses, the instructor gradually withdraws and students begin interacting on their own. This produces a high rate of student involvement and high rates of course performance (Davies & Graff, 2005).

Another challenge is the disconnect felt by relying solely on textual communication in emails, chats, etc. Research by Whithaus & Magnotto (2006) suggests that incorporating live video into online course design greatly improves student feelings of presence, control, dialogue and liveliness and has a positive impact on student satisfaction and grades. Students feel more

connect after conducting regular live video chats with their instructor, and the wide availability of video chat services makes this an easy way to help students succeed.

Since online learners do not attend scheduled classes, online courses are flexible and can easily accommodate even full-time work schedules. However, students tend to spend more time navigating course technology (Marsden, 2003) and are at a greater risk of failing than conventional students unless they are motivated and practice good time management (Eom, Wen, and Ashill, 2006). Young, Robinson & Alberts (2009) suggest that the absence of physical lecture may actually have a positive effect on student learning. Pedagogical research consistently finds a decrease in attention beginning somewhere between 10 and 30 minutes into the lecture. Students learning on their own, however, tend to pay attention to the course material for longer periods of time since they are actively engaged. Instructors also benefit from the flexibility of not needing to attend a physical class, but must approach online instruction differently. One of the primary responsibilities of the instructor is to provide feedback. Course tools must allow for open lines for communication between students and instructors, and instructors must provide in-depth performance feedback (Macdonald, 2004).

The model used for curriculum development with this course was the Minasian-Batmanian (2002) model for online course development. Course development using this model begins with the instructor identifying basic information about the target groups that will be taking the course, including demographic and psychographic data. The underlying theory behind this is that the better an instructor understands the students who are likely to enroll in the course, the better the instructor will be able to design the course to fit the educational needs of the students. In the case of this project, the curriculum developer was well positioned to understand the needs of the target group, having worked in the field of digital media for over a

decade. Using the Minasian-Batmanian model, once the instructor has a good understanding of the target group, course development begins using five stages: analysis, design, development, testing and evaluation.

In the analysis phase, the course developer identifies learning objectives and learning outcomes for the course. The instructor may also begin to explore potential learning methods that may be particularly useful with the target group. In the design process, the course developer defines course content and establishes a way to assess learning objectives. Course content includes any text or multimedia that will accompany the course as well as assignments, projects, etc. Assessment usually includes tests and grading rubrics that provide an accurate way to judge whether the student has met the learning objectives. In the testing phase, third-party individuals (people who were not involved in the development of the course) review the course content and methodology to help identify any potential issues. In the evaluation phase, feedback from students is used to rank the overall effectiveness of the course, and evaluate how well students were able to consume and apply the information in the course.

One of the goals for this course is that students increase their information literacy, or their ability to retrieve information and learn via their own access to the wealth of information available on the Internet. The adage "Give a man to fish and he is fed for a day; teach a man to fish and he is fed for a lifetime" is particularly applicable in the information age. While this course will prompt students to find the information needed to complete course requirements, any kind of continued independent advancement will depend on the student's ability to find information effectively. For instance, if students desire to learn advanced JavaScript after the course they should know what keywords to use to find applicable tutorials on the Web. Therefore, the pedagogical design of this course is based in part on the ACRL competency

standards for information technology (Association of College & Research Libraries, 2004) and its five established standards, performance indicators and outcomes (Appendix 2). The standards suggest two primary focuses for achieving information literacy: Fluency and Literacy. Fluency in Digital media, although it may require more intellectual abilities than simply the learning of software and hardware associated with it, is still focused solely on the technology itself. According to McNeely & Wolverton (2008), the next knowledge institution will be a "hybrid of experimental knowledge production + disciplinary knowledge. It will apply learning in experimental settings to engage with public needs, most likely in response to environmental urgencies" (p. 39). Evidence of this concept can be seen in the use of Twitter in the recent "Arab Spring." Education, especially in the field of digital media, must focus on giving students the tools to create the tools that best fit their circumstances. As a prerequisite to using these tools, students must become fluent in the technology that enables them.

Literacy in digital media, on the other hand, is more of an intellectual framework for understanding, finding, evaluating, and using digital information. Literacy will allow students to participate in activities which may be accomplished in part by fluency with digital media, in part by sound investigative methods, but most important, through critical discernment and reasoning. In order to achieve digital media literacy, this course will teach students about digital media from a theoretical perspective, inform them on emerging trends, instruct them on implementation requirements and strategies, and teach them the concepts and terminologies they will need to work effectively in the field of communication.

Competencies in the course modules are based on the WaSP InterACT curriculum framework. WaSP interACT is an initiative of the Web Standards Project. The WaSP interact curriculum framework is an community-driven project serving as a collective knowledge base

containing competencies from many collaborators across the field of web design. The framework is based on six developmental areas (WaSP InterACT, 2012): Foundations, Front-end Development, Design, User Science, Server-side Development and Professional Practice.

Foundations focus on the basic principles that provide a solid foundation for anyone aspiring to be a web professional, whether as a writer, designer or programmer. It includes a basic understanding of the World Wide Web and broad topics such as browsers, blogs and search. Front-end development exposes students to front-end technologies including HTML, CSS and JavaScript. These technologies define the interface of website and applications. The Design area reviews compositional techniques and design tools that give students the ability to design a website. Even if the student does not have a particular knack for design, they should be able to identify effective compositional techniques and reproduce them. User science introduces learners to research in the area of web design. Students should understand how to hypothesize, prototype, evaluate and redesign in order to produce websites that accomplish usability goals. Server-side development provides a broad understanding of how servers communication and store data and implications for designing web applications. Finally, Professional practice focuses on providing students with the professional tools they will need to apply what they have learned to their own professional devilment and advancement. Portfolio building, professional interaction and team collaboration skills are developed.

Course Outline

This distance-learning course will require access to the Internet and modern Internet browser software, such as Internet Explorer or Mozilla Firefox. To provide relevant feedback and accurate grades for written assignments, the course should be taught by an instructor with a background in Digital Media education or production. The instructor will need to have a

working knowledge of web technology and be familiar with production tools and techniques. The course will be administrated through an online teaching tool such as the “Blackboard” system typically found in institutions of higher education. The SUU course will be administer through the “Canvas” system. If such a system is not available, administration will be done through email. Modules will be uploaded to the Blackboard system by the instructor and would then be accessible to the students. Each assignment will be given a due date and finished assignments would be uploaded by the student in the system prior to the due date. The instructor will provide feedback on assignments by making comments on the assignment and then upload the graded, commented version to the “Graded” section of the Blackboard. The instructor may also provide feedback through direct email, phone calls or video conferencing with the students.

Learning outcomes for students will include the following:

1. Understanding the terminology required to drive web projects
2. Learning best practices for creating their own web projects
3. Applying the scientific approach to usability in web projects

These outcomes will be measured directly and indirectly. Indirect measures will include observing end-of-semester course evaluations and surveys of student’s attitudes concerning pedagogy and curriculum. Direct measures will include analysis of overall course grades, individual assignment scores, and the quality and accuracy of the completed final project.

Syllabus: The Web for Communication Professionals

The web is taking an increasingly prominent role in the lives of communication professionals. Students entering the field of communication will undoubtedly be involved in web projects in their careers. This course focuses on web design for communication professionals. Students will be exposed to terminology and methodology for producing web media in a professional communication environment. Course material will help students accomplish the following instructional objectives:

1. Understand the terminology required to participate effectively in web projects
2. Learn best practices for developing web projects
3. Apply the scientific approach to usability in web projects

Required Texts

Interact with Web Standards: A Holistic Approach to Web Design by Anderson, DeBolt, Featherstone, Gunther, Jacobs, Jensen-Inman, Mills, Schmitt, Sims and Walter (2010) (ISBN- 0321703529)

The Web for Communication Professionals by Hall (2012)

Required Software

This class requires some specialized software. These include a basic text editor and web browser, which are included in most modern operating systems. Students must also have access to a graphic editor and FTP client. Free graphics editors and FTP clients can be downloaded and installed for multiple platforms. *This class requires that you have the ability to install software on your computer if it is not available on school computers.* Students will also be asked to set up accounts (if they have not already) with a free web host and a free content management system. Please consult your instructor if you are not able to do so.

Grading

Grades in this course are comprised of Assignments, Weekly Blog Posts, Weekly Review Questions and the Final Project. Each of these four components represents 25% of your grade. Late work is accepted only if the instructor judges the reason sufficient and only if you notify the instructor at least one week before the due date. Otherwise no late work will be accepted. When projects are finished late unexpectedly in the corporate world, people lose their jobs. It's good to get in the habit of planning ahead.

Assignments
Each week there will be an assignment due the following week. These assignments include writing papers, developing code and working with web design tools.

Course Blog
Each week students will be required to write a blog post that expands upon the topics discussed in the readings. Posts should be at least 500 words in length and should contain images and links where appropriate.

Review Questions
Each week students will answer review questions covering topics discussed in the readings.

Required Format
Written papers should be submitted using current APA format, double-spaced.

Communication
Since the instructor for this course is off-site, there are no official office hours for students to stop by for a chat. I will make an effort to answer all emails from the previous day by 8pm each night. Emails from the weekend will be answered on Monday. My skype handle is chrishallmedia, and you are welcome to try to catch me if you see that I am logged in.

Final Project
The final project for this course will be the creation of a moderate-sized website including planning, content creations, design, development and presentation. Students will use the techniques learned throughout the course to develop user personas, test a prototype, write design and code and then present the final website.

Academic Honesty
Cheating is not tolerated. Respect others intellectual property as you do your own. Please remember that this policy extends to downloading illegal software and other files that are digital-rights managed through peer-to-peer files sharing. For details on the current policy please consult the student handbook.

Students with Disabilities
Please contact the instructor if you have any medical, psychological, learning or other disabilities that require academic adjustments or accommodations. You should also contact the Disability Support Center in Room 205D of the Sharwan Smith Center. The phone number is (435) 865-8022. Student support services determine eligibility for and authorize the provision of these services and aids.

Grading Scale
A 93% and Above
A- 92% - 90%
B+ 89% - 87%

B 86% - 83%
B- 82% - 80%
C+ 79% - 77%
C 76% - 73%
C- 72% - 70%
D+ 69% - 67%
D 66% - 63%
D- 62% - 60%
F 59% and Below

If you are unhappy with your grade on any particular project and feel as though you deserve something better, I welcome you to plead your case. However, if your argument is not compelling, your grade will remain unchanged. You should also plan on more critical examinations of your work in the future.

Course Schedule

Module 1
Required Reading:
- The Web for Communication Professionals Ch. 1
- Interact with Web Standards Ch. 1,2,3

Assignment: Course Blog

Module 2
Required Reading:
- The Web for Communication Professionals Ch. 2
- Interact with Web Standards Ch. 4
- Predicting the next 5,000 days of the Web (Video) by Kevin Kelly

Assignment: Web scavenger hunt
Due: Course Blog assignment, Blog Post 1

Module 3
Required Reading:
- The Web for Communication Professionals Ch. 3
- Interact with Web Standards Ch. 5
- World's Best Headlines: BBC News, by Jakob Nielsen
- Speed-Dating Your Source Content in 4 Easy Steps, by Angie King
- The Discipline of Content Strategy, by Kristina Halvorson

Assignment: What does it do?
Due: Web scavenger hunt assignment, Blog Post 2, Ch. 2 Review Questions

Module 4
Required Reading:
- The Web for Communication Professionals Ch. 4
- Interact with Web Standards Ch. 6
- Presenting Information Architecture, Web Style Guide 3rd Edtion

Assignment: IA Critique paper
Due: What does it do? , Blog Post 3, Ch. 3 Review Questions

Module 5
Required Reading:
- The Web for Communication Professionals Ch. 5
- Interact with Web Standards Ch. 7

Assignment: Project Brief
Due: IA Critique paper, Blog Post 4, Ch. 4 Review Questions

Module 6
Required Reading:
- The Web for Communication Professionals Ch. 6
- Interact with Web Standards Ch. 8
- HTML Wireframes and Prototypes: All Gain and No Pain by Julie Stanford
- How to conduct a Heuristic Evaluation by Jakob Nielsen

Assignment: Interactive prototype
Due: Project Brief, Blog Post 5, Ch. 5 Review Questions

Module 7
Required Reading:
- The Web for Communication Professionals Ch. 7
- Getting your content online by Craig Grannell

Assignment: Set up a webhosting account
Due: Interactive prototype, Blog Post 6, Ch. 6 Review Questions

Module 8
Required Reading:
- The Web for Communication Professionals Ch. 8
- Interact with Web Standards Ch. 9
- How to Choose a Website Content Management System by Theresa Regli

Assignment: Install Wordpress CMS
Due: Set up a webhosting account, Blog Post 7, Ch. 7 Review Questions

Module 9
Required Reading:
- The Web for Communication Professionals Ch. 9
- Interact with Web Standards Ch. 10,11
- Responsive Web Design by Ethan Marcotte
- Marking up textual content in HTML by Mark Norman Francis
- Validating your HTML by Mark Norman Francis

Assignment: Valid HTML document
Due: Install Wordpress CMS, Blog Post 8, Ch. 8 Review Questions

Module 10

Required Reading:

- The Web for Communication Professionals Ch. 10
- Interact with Web Standards Ch. 12,13
- Your first look at JavaScript by Christian Heilmann

Assignment: JavaScript Alert
Due: Valid HTML document, Blog Post 9, Ch. 9 Review Questions

Module 11

Required Reading:

- The Web for Communication Professionals Ch. 11
- Interact with Web Standards Ch. 14,15,16,17
- Good vs. Great Design by Cameron Moll (Video)
- Color Schemes and Design Mockups by Linda Goin

Assignment: Identify Composition concepts
Due: JavaScript Alert, Blog Post 10, Ch. 10 Review Questions

Module 12

Required Reading:

- The Web for Communication Professionals Ch. 12
- Interact with Web Standards Ch. 18,19,20,21
- Good vs. Great Design by Cameron Moll (Video)
- Color Schemes and Design Mockups by Linda Goin

Assignment: Final Assignment
Due: Identify Composition concepts, Blog Post 11, Ch. 11 Review Questions

Module 13

Required Reading:

- The Web for Communication Professionals Ch. 13
- Interact with Web Standards Ch. 22,23,24,25

Due: Blog Post 12, Ch. 12 Review Questions

Module 14

Due: Final Assignment, Ch. 13 Review Question

Module Content

Module 1

Assignment: Create a course blog

Setup a blog using WordPress. Each week of the course, write one blog post that expands upon the topics discussed in the module or readings. Each post should be at least 500 words in length, and should contain images and links where appropriate.

1. Go to http://wordpress.com/
2. Click the big orange button labeled “Get started here”
3. Fill out the registration form, creating a Blog Address for your site. Please do not purchase a domain name for this site, just use the default “.wordpress.com”
4. When you have registered your account by email, log in to your site and browse the dashboard area. There are several resources at the top of the page to help you learn how to use the interface. Read them.
5. Create your first blog post, writing about what you like and don’t like about the wordpress system.
6. Create a page titled “About” and populate it with at least one picture of yourself and a one-two paragraph description of yourself.
7. Install a theme other than the default
8. Send your instructor a link to your site

Review Questions: None

Instructor Key

Create a Course Blog Assignment

Criteria	Performance Quality			
	0 points	**1 point**	**2 points**	**3 points**
Blog Posts (evaluated weekly)	Blog post was not published on time, is poorly written, does not contain content relevant to the course, or does not meet the post length requirement.	Blog post was published on time, contains some spelling and/or grammatical errors, meets the post length requirement, but content is not very relevant to the course, or does not expand upon course topics.	Blog post was published on time, contains no spelling and/or grammatical errors, meets the post length requirement, and the content expands upon course topics.	Blog post is published on time, is very well written with no typos, grammar, or spelling errors, expands upon course topics, and exceeds the minimum post length. Post contains images where relevant to the content, and links to plenty of sources and resources.

Module 2

Assignment: Web Scavenger Hunt

Using a search engine find answers to the following questions. For each question list the query string (phrase) you typed to find the answer and the rank/position of the answer with the correct answer. If you click on links that yield no answer, note that.

- In regard to Internet Protocols, explain what is meant by the "handshake".
- Who is Tim Berners-Lee and what was his role in development of the Internet?
- In what year was the first World-Wide Web software created by Tim Berners-Lee?
- What is a homepage?
- What is a digital design?
- Give three examples of web programming languages.
- What does W3C stand for? What year was the group formed? Who formed it?
- What year was the Web Standards Project formed? Who formed the group?
- Project Gutenberg puts public domain literature and information on the Internet. What was the first document posted?
- Douglas Engelbart was a computer visionary of the 1960's. What did he invent that you find handy?
- Define SaaS.
- What is a computer virus?
- What was ENIAC?
- List three causes and 3 symptoms of Internet Addiction Disorder.
- Aside from the W3C, list two entities that help govern the web.

Review Questions: How the Internet Works

1. ARPANET was the first network to successfully _____ _____
2. The first word to be sent over the Internet was _____.
3. Tim Berners-Lee created the basic components of the _____ _____ _____.
4. One of the first graphical browsers was _____.
5. One of the problems that caused the dot-com boom was startup companies that would charge _____ or _____ for their product or service initially.

6. In order to connect to the Internet, you must first have access to an _____ _____ _____.
7. Modems modulate an _____ signal to encode digital information
8. While not every place on the web has an associated domain, every place on the web **does** have an _____.
9. The advantage to server-side scripting is the ability to customize the response based on the _____ _____.
10. Server-side scripts are never visible to the _____.
11. Basic web-hosting packages usually have _____ features and can only handle _____ traffic volumes
12. Information travels over the Internet in _____.
13. The World Wide Web Consortium was created to ensure _____ and agreement among industry members in the adoption of new standards.
14. ICANN is responsible for managing the _____ _____ _____ spaces.
15. Top-level domains are the _____ level in the domain system hierarchy.

Instructor Key

Review Answers

1. Switch packets
2. "LOGIN"
3. World Wide Web
4. Mosaic
5. Little, nothing
6. Internet Service Provider (ISP)
7. Analog
8. IP address
9. User's input
10. Browser
11. Limited, low
12. Packets
13. Compatibility

14. Internet Protocol address
15. Highest

Web Scavenger Hunt Assignment

Criteria	Performance Quality				
	0 points	**1 point**	**2 points**	**3 points**	**4 points**
Web Scavenger Hunt	No answers submitted.	No or few queries are shown and the answers are incomplete.	Some Query strings are listed. The questions are answered in incomplete, non-succinct words or phrases.	Query strings are listed for each question showing the growth of the query. The questions are answered in sentences	Multiple Query strings are listed for each question showing the growth of the query. The questions are answered in complete, succinct sentences

Module 3

Assignment: What does it do?

Analyze the http://www.xango.com/ web site and answer the following questions:

- Who is the product, service, or information for?
    - Who are the target audiences for this page?
    - Can these audiences tell from this copy that the writers are speaking to them?
    - Can other people outside our audience tell that the writers are NOT speaking to them?
- What is the product, service, or information, exactly?
- Have the writers spelled out, clearly and in simple language, what the product is?
- Are the nouns as concrete as they can possibly be?
- What does the product do for its target user?
    - Have the writers laid out the product's primary features and benefits in a clear, concrete way?
- Is it clear why the product, service, or information is better than the available alternatives?
    - What evidence is presented for those claims?
    - Are the writers presenting that evidence clearly and without fluffy, empty language that makes them look like they're boasting?

Review Questions: Writing for the Web

1. Three considerations unique to writing for the web are _____, _____ and _____.
2. _____ refers to the ability of a product to be used by as many people as possible.
3. Usability in web writing refers to the use of text to make a web page more user-friendly by using _____ _____ to describe web navigation and click through processes.
4. _____ refers to how easily users can find the information they need on a website, as well as how easily a user is able to find your website through a search engine.

5. User-centered design is based on the _____ _____ _____.
6. A _____ describes social context and attempts to exemplify the actual world that a user is experiencing.
7. _____ _____ describe the interaction between an individual and his or her interaction with a product.
8. Writing voice is comprised of writing elements such as_____ , _____, _____, dialogue, and character development.
9. _____ voice describes an action directly, whereas _____ voice describes the action indirectly.
10. One of the most important audiences on the web is the _____ _____ _____.
11. _____ identify the user motivations, expectations, and goals responsible for driving online behavior.
12. A common task of web writers is to take content from _____ _____ and include them in a website
13. A _____ is meaningful only when it makes sense out of its usual context.
14. _____ define HTML content

Instructor Key

Review Answers

1. Accessibility, usability, and findability.
2. Accessibility
3. Meaningful text
4. Findability
5. Rhetorical situation model
6. Scenario
7. Use cases
8. Syntax, diction, punctuation
9. Active, passive
10. Search engine spider

11. Personas
12. Print sources
13. Link
14. Tags

What does it do? Assignment

Criteria	Performance Quality			
	0 points	**1 point**	**2 points**	**3 points**
What does it do?	The student's work does not fulfill the basic requirements of the assignment.	The student's work fulfills the basic requirements of the assignment, but it doesn't answer all the questions or demonstrate a thorough understanding of the relevant concepts. It may contain mechanical errors, and is not written fluidly.	The student's work fulfills the basic requirements of the assignment, answers all the questions, and demonstrates a reasonable understanding, though not mastery, of the relevant concepts. It contains few mechanical errors, but may not be written fluidly.	The student's work fulfills all requirements of the assignment, answers all the questions, and demonstrates an in-depth understanding of the relevant concepts. It is fluidly written, and contains no major mechanical errors.

Module 4

Assignment: Create a Content Inventory and Site Diagram

Conduct a content inventory on a small local restaurant or club's web site. In order to keep this assignment to a reasonable size, it is suggested that you not use a national chain or any site that has more than 30 pages. Use the simple content inventory spreadsheet format described in this module to document your website. The content inventory should include at least 15 pages on the site. Each page should have a unique page id number.

After you have completed your content inventory, use paper and a pencil to create a simple content map diagram based on the content inventory. Use the page titles and unique page id numbers from the content inventory to label each page on the content map. Scan this document and send it along with your content inventory to your professor.

Review Questions: Information Architecture

1. The “heavy lifting” of the information architect takes place in the _____ three stages of the development process.
2. While client interviews can be conducted over the phone, _____ - __ - _____ is usually preferable.
3. The primary purpose of a client interview is to establish the _____ of a project in order to begin requirements documentation.
4. The creative brief should record _____ attributes such as “how do your customers feel about your product?”
5. A content inventory is a _____ analysis of website content.
6. Many websites were initially created without the aid of a _____ _____ _____.
7. It is important that a _____ _____ perform the content inventory.
8. Card sorting is a user-centered design method for increasing a system’s _____.
9. Site diagrams explain site hierarchy in the format of an _____ _____.
10. Wireframes are usually done in _____ fidelity to facilitate quick iteration.

11. An open card sort is typically done when you want to learn how users _____ content.
12. Process flows can help identify any _____ or awkward interactions.

Instructor Key

Review Answers

1. First
2. Face-to-face
3. Scope
4. Qualitative
5. Quantitative
6. Content management system
7. Living person
8. Findability
9. Organizational chart
10. Low
11. Group
12. Superfluous

Create a Content Inventory and Site Diagram Assignment

	Performance Quality		
Criteria	**0 points**	**1 point**	**2 points**
Content Inventory	Content inventory contains less than 15 items. Pages are not uniquely identified. The content inventory is inaccurate and/or incomplete. There are three or more grammatical errors.	Content inventory contains 15-20 items. Pages are uniquely identified with a page id number. The content inventory is accurate and complete. There are three or fewer grammatical errors.	Content inventory contains 20-30+ pages. Pages are uniquely identified. The content inventory is accurate and complete. There are no grammatical errors.

Site Diagram	Content Map is incomplete. The map is not well organized. The map includes data that is not represented on the content inventory. There are three or more grammatical errors.	Content Map is complete. The map is well organized. The map includes all the data represented on the content inventory including the unique identifiers. Most of the data on the map is relevant. There are three or fewer grammatical errors.	Content Map is complete. The map is well organized. The map includes all the data represented on the content inventory including the unique identifiers. All data on the map is relevant. There are no grammatical errors.

Module 5

Assignment: Project Brief

Go to ABC's online schedule application at http://abc.go.com/schedule. Imagine that this application hasn't been created yet, and that you have been tasked with managing the project. Write a description of the project including the following:

- Project purpose: who is the client? What is the purpose of the project? What are its business goals?
- Project scope: what are we producing?
- Project sponsors & stakeholders: who are the major decision-makers who have sign-off capacity? What is their contact information?
- Success criteria & quality definition: are these your criteria of success or the client's criteria?
- Project constraints, assumptions and dependencies.
- Resources: what human resources, technologies, applications and tools do we have?
- Project budget (Estimate and provide reasoning)
- Milestones
- Project time/cost estimation: what is the proposed estimated project length? How many hours will it take to complete the project within budget in the given amount of time? What is the preliminary estimated timeline for the project?
- What process will you use? (waterfall, agile or design chunking) Why?
- What are the phases of the project?

- What will be the project deliverables?

Review Questions: The Development Process

1. It is common for _____ _____ to oversee online development.
2. Development processes should be under constant _____.
3. The _____ development model was initially used in the manufacturing and construction industries.
4. The _____ approach breaks tasks into small increments with minimal planning in order to provide a less rigid development process.
5. Agile development emphasizes _____ _____ as the primary measure of progress.
6. Creative direction can be understood through the help of a _____ _____.
7. The project overview should go over _____ goals, not focusing on the details that the client doesn't care about.
8. An understanding of _____ _____ is key to effective experience planning.
9. The web designer will transfer necessary layout design _____ over to formats that can be used in HTML.
10. Websites need to be tested across multiple _____ and _____ in a multiple of scenarios to know if they look and act the same in all.
11. _____ testing is especially important in sites that receive and store sensitive information, such as payment or personal information.
12. _____ _____occurs when certain code features are excluded from the library of code currently used.

Instructor Key

Review Answers

1. Communication professionals
2. Scrutiny
3. Waterfall
4. Agile
5. Working software
6. Creative brief

7. Holistic
8. Users' habits
9. Graphics
10. Browsers, operating systems
11. Security
12. Code deprecation

Project Brief Assignment

Criteria	Performance Quality			
	0 points	**1 point**	**2 points**	**3 points**
Project Brief	Little if any of the project purpose is defined: the client description is inaccurate, the scope of the project and the project goals are unclear and difficult to understand. Required information is not submitted.	Some of the project purpose is defined: the client is described only partially, the scope of the project and the project goals are partially clear and understandable. Some of the required information is submitted.	The project purpose is mostly defined: the client is described moderately, the scope of the project and the project goals are mostly clear and understandable. Most, but not all of the required information is submitted.	The project purpose is well defined: the client is described well, the scope of the project and the project goals are clear and understandable. All of the required information is submitted.

Module 6

Assignment: Interactive Prototype

Using Microsoft PowerPoint, create an interactive prototype of a simulated web page. In PowerPoint, design a simple website layout using the drawing tools provided in PowerPoint including a header, main navigation, body and footer. Use the hyperlink feature in PowerPoint to create 5 different pages with different body content and make the navigation clickable. For help with linking, see http://office.microsoft.com/en-us/powerpoint-help/create-a-hyperlink-HA010336512.aspx.

Review Questions: Prototyping

1. Prototypes are usually created once the requirements documentation and _____ have been completed.
2. Software prototyping draws many of its methods from _____ _____ prototyping.
3. The principle of _____ _____ says that simpler explanations are, other things being equal, generally better than more complex ones.
4. _____ describes the level of detail and functionality in a prototype.
5. Throwaway prototypes fall at the _____ fidelity end of the spectrum.
6. Evolutionary prototypes are toward the _____ fidelity end of the spectrum.
7. For teams on a shoestring budget, _____ is a great low-cost alternative to many prototyping software packages.
8. _____ _____ are a valuable opportunity to gather usability information.
9. _____ _____ is a form of usability inspection where usability specialists judge whether each element of a user interface follows a list of established usability heuristics.
10. Subjective assessment is more _____ in nature and tells the evaluator how the users feel about the software being tested.
11. If you are conducting an online focus group, you will need the appropriate _____ that allows the participants to chat and see the chats of others and also allows the focus group team to send questions to the moderator.
12. An experienced _____ is important for a successful focus group.

13. Immediately _____ a focus group session, the moderator should walk through the results and review the trends, questions, and comments for each section of the study.
14. All data from the focus group should be _____ and _____.

Instructor Key

Review Answers

1. Wireframes
2. Industrial design
3. Ockham's' razor
4. Fidelity
5. Low
6. High
7. Paper
8. Focus groups
9. Heuristic evaluation
10. Qualitative
11. Software
12. Moderator
13. After
14. Coded, recorded

Interactive Prototype Assignment

	Performance Quality			
Criteria	**0 points**	**1 point**	**2 points**	**3 points**
Interactive Prototype	Prototype was not completed on time, does not show multiple pages, contains no interactivity.	Prototype was completed on time, shows multiple pages, but has basic interactivity	Prototype was completed on time, shows multiple pages, incorporates semi-functional interactivity, pages designed as outlined	Prototype was completed on time, shows multiple pages, incorporates fully-functional interactivity, pages design with extra consideration to detail

Module 7

Assignment: Set up a Web Hosting Account

1. Find a free or paid web host and create an account. Popular free hosts include www.000webhost.com and www.doteasy.com/FreeWebHosting. Be sure that the host you choose allows FTP access.
2. Download and install Filezilla, a free FTP Client from http://filezilla-project.org/
3. Using the support information on the website of the host you chose, configure Filezilla to connect to your host. Using Microsoft word, create a document containing the text "Hello World" and save the document as an HTML document named "hello.html" (under "File->Save as web page").
4. Upload the HTML document into the root directory of your hosting server.
5. Send your instructor a link to the hello.html file.

Review Questions: Tools

1. Websites are made available to the Internet via _____ _____.
2. Some people use their own _____ _____ as web servers.
3. A _____ is a company that has a large datacenter with hundreds or thousands of web servers.
4. The term _____ refers to how many visitors you receive to your website and how much they download from your site.
5. Many web hosts also offer access to different general _____ that can be added to your site.
6. Even though most people do not use a dedicated server, it is important that the web host you choose has good _____.
7. _____ is a simple, common way for non-programmers to exchange files over the Internet.
8. While it is possible to make an FTP connection using a standard _____ _____, most people prefer to transfer files with the help of a dedicated FTP software program.
9. There is no standard way to organize a website's _____ structure.
10. On your development computer, the _____ is the topmost parent folder of the website.
11. The _____ _____ is the address a user enters to access your website.

12. A domain name needs to be registered with one of the _____ approved domain registrars for a yearly registration fee.
13. Default _____ _____ ship with most operating systems.
14. _____ _____ come from three general sources: industry standards, company standards, and personal standards

Instructor Key

Review Answers

1. Web servers
2. Personal computers
3. Web host
4. Datatransfer
5. Applications
6. Scalability
7. FTP (File Transfer Protocol)
8. Web browser
9. File
10. Root
11. Domain name
12. ICANN
13. Text editors
14. Best practices

Set up a Web Hosting Account Assignment

	Performance Quality			
Criteria	**0 points**	**1 point**	**2 points**	**3 points**

Valid HTML Document	Assignment was not completed.	Host account was set up but file was not uploaded correctly	Host account was set up, FTP connection was made but file was uploaded incorrectly	Host account was set up, FTP connection was made and file was uploaded correctly

Module 8

Assignment: Install Wordpress CMS

Using the hosting account you created in the section on tools, install the Wordpress CMS on your hosting account by following the "Five minute Install" instruction located here: http://codex.wordpress.org/Installing_WordPress#Famous_5-Minute_Install.

When you have done this, send your instructor the URL of your wordpress site.

Review Questions: Content Management

1. Early web editors generally lacked _____.
2. Front-end designers are more _____ than graphic designers of the past.
3. Content Management Systems generally use some sort of _____ system.
4. One of the underlying technologies that makes templating possible is _____ _____ _____.
5. CMS software is particularly good at creating _____ _____ that can be managed by an administrator.
6. Content syndication is usually done through an _____ or _____ feed.
7. _____ refers to the ability to "roll back" to previous versions of the website.
8. _____ _____ software is updated and maintained largely by a collaborative development community and the system is available for free.
9. CMS software that allows for _____-_____ _____makes it easy to maintain the same look and feel and basic content structure while allowing for changes to language and images.
10. Without proper _____ a CMS is essentially useless.
11. Some open source solutions still require that some kind of _____ is given about the CMS on your website

Instructor Key

Review Answers

1. Sophistication
2. Technical
3. Templating

4. Cascading Style Sheets
5. Task cycles
6. RSS, Atom
7. Versioning
8. Open source
9. Multi-market localization
10. Documentation
11. Recognition

Install Wordpress CMS Assignment

	Performance Quality			
Criteria	**0 points**	**1 point**	**2 points**	**3 points**
Valid HTML Document	Assignment was not completed.	Link to wordpress site works, but with errors and assignment was submitted late.	Link to wordpress site works but assignment was not submitted on time	Link to wordpress site works and assignment was submitted on time.

Module 9

Assignment: Valid HTML Document

Using a simple text editor (Notepad if you are on a PC, TextEdit if you are on a mac) you will create and validate your first HTML document. Using the W3C reference table, create an HTML document using the correct tags for the following elements: Heading, paragraph, Hyperlink and Unordered List. Upload the file your web hosting account, using any file name you prefer. Then go to the W3C online validator, and submit the URL of your site. Click the "Check" button, and take a screen capture of the results. Email the complete html file and the screen capture to your instructor.

Review Questions: Presentation

1. HTML reads from top to bottom, _____ to _____.
2. All HTML tags use the same _____.
3. Using old HTML standards, we used HTML tags to control _____ elements.
4. _____ are used to add additional information to HTML tags.
5. Many tags are assigned _____ attributes.
6. Some HTML tags have been_____ , meaning that the HTML code base no longer supports them.
7. _____ _____ _____, or CSS, is the recommended way to control the presentation layer in a web document.
8. One of the most powerful properties of CSS is its _____ abilities.
9. When an element inherits a value from its parent, it inherits its _____ value.
10. _____ style sheets are the most common and preferred method for applying CSS to a website.
11. CSS allows websites to detect which _____ _____ is viewing the website.
12. The ability to _____ a website is useful and sometimes even necessary.
13. Media queries are meant for design presentation, not _____

Instructor Key

Review Answers

1. Left, right

2. Formatting
3. Presentation
4. Attributes
5. Default
6. Deprecated
7. Cascading Style Sheets
8. Inheritance
9. Computed
10. Linked
11. Screen size
12. Print
13. Optimization

Valid HTML Document Assignment

	Performance Quality			
Criteria	**0 points**	**1 point**	**2 points**	**3 points**
Valid HTML Document	Assignment was not completed.	HTML document was turned in incomplete, not validated	HTML document was completed correctly but validation was not turned in.	HTML document was completed correctly and validation was turned in.

Module 10

Assignment: JavaScript Alert

Using this tutorial: http://www.w3schools.com/js/js_popup.asp add a popup alert to the valid HTML page you created in the last module. Send a link to your instructor.

Review Questions: Behavior

1. Object-oriented programming consists of _____, _____, and _____.
2. Each object has inherent _____.
3. _____ are the commands that tell an object what to do.
4. _____ _____ technologies contain functionality that operates within the browser on the user's computer.
5. Languages like JavaScript and Actionscript are dialects of_____.
6. With _____ , web applications can communicate with the server side without interfering with the display and behavior of the existing page.
7. As demand for sites that use JavaScript has increased, time-saving _____ began to emerge that allowed developers to reuse chunks of code to accomplish common tasks.
8. _____ _____ scripting takes place directly on the server, as opposed to within the browser like client-side scripting.
9. Most websites today store their data in a_____.
10. Nearly all databases are _____.

Instructor Key

Review Answers

1. Objects, methods, properties
2. Properties
3. Methods
4. Client side
5. ECMAscript
6. Ajax
7. Frameworks

8. Server-side
9. Database
10. Relational

JavaScript Alert Assignment

Criteria	Performance Quality			
	0 points	**1 point**	**2 points**	**3 points**
JavaScript Alert	Assignment was not completed.	Assignment was attempted but popup does not work.	Assignment was completed and popup works, but with errors.	Assignment was completed and popup works.

Module 11

Assignment: Identify Composition Concepts

Your assignment is to find examples of websites that clearly display each of the concepts of composition outlined in this chapter. For each of the concepts, take a screenshot of the website that displays the concept and paste it into a word document. Then write a paragraph for each one describing why you think the website conforms to that concept.

Concepts

- Balance
- Rhythm
- Proportion
- Dominance
- Unity

Review Questions: Design Concepts

1. _____ is the distribution of elements in a design as it relates to their visual weight within a composition.
2. Rhythm is also known as _____.
3. Aligning a composition according to _____ ___ _____ creates more tension, energy, and interest in the composition than simply centering the feature would.
4. _____ will create an entry point on the page from which you can lead the viewer to other parts of the page.
5. In general, the way to create dominance in an element is by adding visual _____.
6. _____ gives a sense of oneness to a visual image, helping the words and the images work together to create meaning.
7. _____ is the process of putting your product in a specific place in an audience's mind.
8. _____ elements are a good way to communicate character.
9. Prior to _____ _____ technology, designers were constrained to the fonts that were available in a user's operating system.

Instructor Key

Review Answers

1. Balance
2. Repetition
3. Rule of Thirds
4. Dominance
5. Weight
6. Unity
7. Positioning
8. Anthropomorphic
9. Font embedding

Composition Concepts Assignment

	Performance Quality			
Criteria	**0 points**	**1 point**	**2 points**	**3 points**
Composition Concepts	Assignment was not completed.	The student found examples but they are not related to the concept and poorly described	The student found related examples but they are poorly described	The student found good examples related to the concepts and described the relationships well

Module 12

Final Project

For the final project you will design, develop and present a functional website of your own. The project will consist of the following steps:

1. Create a project requirements document
2. Develop a competitive analysis
3. Create a persona for your target user
4. Draw a site diagram
5. Develop an interactive prototype of the website using PowerPoint
6. Conduct and document user testing
7. Write the textual content for your website following the guidelines in the module on "Writing for the web"
8. Gather or create visual assets (photography, animations, video) necessary for the site
9. Create a pixel-perfect design for your site using a graphic editor
10. Create at least 10 pages using valid HTML
11. Present your website in a Skype interview.

Requirements

- All HTML & CSS documents must pass W3C validation
- Use at least one external stylesheet
- The site must contain at least one working form
- Use proper design composition techniques
- Contain tracking code using Google analytics
- Contain at least one multimedia element (video, audio, animation)
- Consistent and well thought-out navigation

Review Questions: Graphics and Multimedia

1. While the code for your website can be created in a simple text editor, the graphics must be created using _____ _____ software.

2. Graphic design software canvases usually allow_____ , letting designers stack different images and shapes on top of each other to keep things organized and create different effects.
3. RGB is _____ while CMYK is_____.
4. Vector images can be resized to large proportions without compromising _____.
5. _____ refers to the number of pixels per inch (PPI) or dots per inch (DPI) in the image.
6. Computer screens and printers are _____ devices.
7. It is _____ to convert from a vector file to a raster file format.
8. GIF files can be saved with a maximum of _____ colors.
9. GIFs can also be_____ , which is a way of saving a graphic so that it loads progressively as it is downloaded.
10. The 16-bit JPEG format was designed with _____ in mind.
11. Every time the browser loads an image on the page, it has to make an _____ _____.
12. Web video plays in your browser using one of a few different _____ protocols.
13. Video _____ is a process by which an editor tries to get the maximum quality from a video while maintaining the smallest possible size.
14. Web _____ can be created using a variety of tools, including Adobe Flash (plays in the Flash player), HTML5 canvas animation technology, JavaScript, or even the latest version of CSS.
15. _____ embedded multimedia is still a few years from adoption.

Instructor Key

Review Answers

1. Graphic design
2. Layers
3. Additive, subtractive
4. Definition
5. Resolution

6. Raster
7. Easy
8. 256
9. Interlaced
10. Photographs
11. HTTP request
12. Streaming
13. Compression
14. Animations
15. HTML5

Module 13

Review Questions: Analytics

1. _____ visitors are the number of unique IP addresses that visited your site.
2. _____ _____ can help you understand what is working in your advertising efforts and offer suggestions as to how people search for your products.
3. Knowing what _____ people used to find your site in a typical search can help you decide what keywords to use in search engine pay-per-click campaigns like Google Adwords.
4. Most analytics offer ways to see the top contributing _____ sites.
5. A _____ _____ _____ is a metric that helps you understand your current performance in relationship to your objectives.
6. A/B testing is a simple application of the _____ _____to web design
7. In A/B/ testing, it is very important that the two versions be tested in as _____ an environment as possible.
8. A _____ _____ is a visual representation of where your users click and show what they are doing on your site.

Instructor Key

Review Answers

1. Unique
2. Traffic sources
3. Searches
4. Referring
5. Key performance indicator
6. Scientific method
7. Similar
8. Heat map

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Appendix 1: Course Workbook


THE
WEB
COMMUNICATION
FOR
PROFESSIONALS
by CHRIS HALL
CSS
CONTENT LAYER
TEMPLATES
OPEN SOURCE COMMUNITY
BRIDGING THE GAP
AGILE
DEVELOPMENT
VERSIONING
CREATIVE BRIEF
INFORMATION
ARCHITECTURE
CONDUCTING FOCUS GROUPS
REGISTERING A DOMAIN NAME
EVOLUTIONARY PROTOTYPE
CONTENT MANAGEMENT SYSTEMS
BUILD TEST DEPLOY MAINTAIN RESEARCH
COMPOSITION
ACCESSIBILITY USABILITY FINDABILITY
DESIGN
CARD SORT
VIDEO
CONTENT INVENTORY
WRITING
PROJECTS
VOICE & TONE
MODEMS
ROUTERS
WEB SERVERS
INFORMATION ARCHITECTURE
CONTENT
MANAGEMENT

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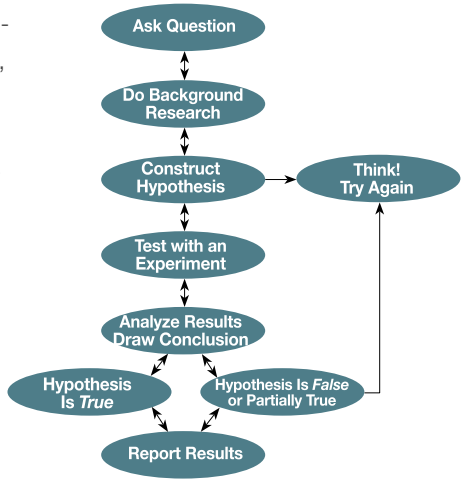
Chapter I

INTRODUCTION

The web is taking a more prominent role in the lives of communication professionals every day. Whether you are a marketing professional, graphic designer, writer, or public relations expert, chances are you are becoming more involved in web projects. The Obama Administration's launch of an online digital literacy portal, digitalliteracy.gov, demonstrates the importance of digital literacy in today's economy. According to research:

- Ninety-six percent of working Americans use new communications technologies as part of their daily lives, while 62% of working Americans use the Internet as an integral part of their jobs (Jones & Madden, 2008).
- Between 1998 and 2008, the number of domestic IT jobs grew by 26%, four times faster than U.S. employment as a whole. By 2018, IT employment is expected to grow by another 22% (U.S. Department of Commerce Internet Policy Task Force, 2010).
- According to one estimate, as of 2009, advertising-supported Internet services directly or indirectly employed three million Americans, 1.2 million of whom hold jobs that did not exist two decades ago (Interactive Advertising Bureau, 2009).



If you are a communication professional, this book will give you the expertise you need to contribute meaningfully to web projects that accomplish your organization's goals. From research to planning to production and assessment, you will get a broad view of how to implement effective web design. It will also introduce you to tools and skills required to create a website yourself, using current web standards.

Despite being immersed in the Internet and new communication technologies, many communication professionals I have worked with feel alienated in projects that deal with Internet technology. I've realized that this feeling is due in part to a simple lack of understanding of the terminology. This book should help you become a more effective Internet communicator by stripping away some of the unknown and giving you confidence to create effective web media. After reading this book, you should be able to have an intelligent conversation with your IT professionals in order to accomplish your goals. I want to take web design out of the fog of technical understanding and help you see it as it applies to you, the communication professional.

We live in an age when many people know basic web design principles. Unfortunately, very few take a scientific approach to web designs. One of the things I hope you take away from this book is that the scientific method can and should be applied to web design. If you haven't thought about the scientific method since high school biology, it basically requires us to answer questions by testing. From data mining and analytics to lab-based usability studies and one-on-one interviews, this book should help you discover the art and science of qualifying and quantifying design decisions.

Ultimately, it's one thing to read about something in a book and quite another to go out and try it yourself. While this book does not cover extensive code (programming language) or programming techniques, the nature of the medium necessitates learning some code. In order for you to use the web as a communication medium effectively, I believe it is important to understand how code works. Understanding the code that makes up the web is no different than the paper and ink that makes up a printing press. This book will give you the technical foundation you need to get started developing and deploying your own web projects.

Learning Outcomes

1. Understand the terminology required to drive web projects
2. Learn best practices for creating your own web projects
3. Apply the scientific approach to usability in web projects

About Me

In the world of web design I have worked as a digital strategy manager, web designer, ActionScript programmer, creative director, and marketing manager. Through each of these roles I have gained a clearer understanding of the things that are important for communication professionals to understand about the web. I sincerely hope that after reading this book you are more confident and successful in your web projects.

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Chapter II

HOW THE INTERNET WORKS

If you're reading this book, it's ikely that you know what the Internet is and why it's important. For communication professionals working with the web, a solid understanding of how the Internet works is requisite in successful web planning and production.

The Internet: A Brief History

Despite being a relatively new technology, the Internet has become a cornerstone of digital media and a standard global method of communication. As of 2010, one in four people worldwide have access to the Internet (Internet World Stats, 2011). Communication via the Internet has evolved over the years from basic electronic mail and static web page publishing to interactive social media and dynamic "one click" syndication.

ARPANET

In the beginning, there was ARPANET, or the Advanced Research Projects Agency Network. The Defense Advanced Research Projects Agency (DARPA) created ARPANET in 1969. ARPANET was the first network to successfully switch blocks of data known as packets, enabling multiple computers to communicate over a network at once. This technology was the foundation of today's Internet.

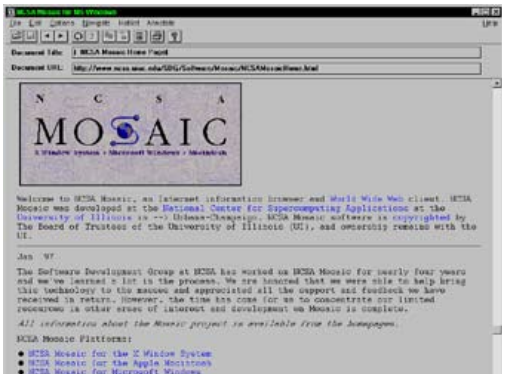
ARPANET was created to help connect a number of large research computers that were separated by wide distances, which was making it difficult for researchers to access them. Another popular theory suggests it was created because the United States was seeking a network that was impervious to nuclear attack (this was at the height of the Cold War); although, the researchers on the team, namely Charles Herzfeld (ARPA Director 1965–1967), have repeatedly debunked this notion. Nonetheless, ARPANET proved successful in solving both of these dilemmas. The network provided security because if part of the system went down, the system as a whole could still maintain information and be recovered. It also made transferring data faster than ever.

The first four computers to connect to the network were at the Stanford Research Institute, UC Santa Barbara, UCLA, and the University of Utah. The first data exchange took place between computers at UCLA and the Stanford Research Institute. A UCLA student programmer named Charley attempted to send the letters of the word "login" one by one over the connection A researcher on the telephone at the Stanford Research Institute confirmed when each letter was received. Much to the chagrin of the researchers, the network

crashed when sending the letter “g.” An hour later, however, the system was restored and the full “login” was received.

ARPANET becomes The World Wide Web

As non-military uses for the network became more evident, civilian research and development grew and technology advanced. In 1980, Tim Berners-Lee was working as an independent contractor for the European Organization for Nuclear Research, networking their research databases. He came up with the idea of using a text system to communicate over the network and realized that his model could be applied to the Internet. He created the major components that form the basic structure of the World Wide Web: a protocol for hypertext (Hypertext Transfer Protocol, or HTTP, that begins every web address), a markup language (HTML, which comprises the basic language web pages are built on), and the first web browser for all of this to be viewed in. This first browser was called “worldwideweb” and also functioned as an html editor. These basic tools made the worldwide use of the Internet possible.



Mosaic Web Browser

One of the major advancements of the World Wide Web was the creation of the Mosaic browser, which was one of the first graphical browsers that made web surfing more intuitive for typical users. Mosaic was also one of the first browsers to display images in the text of the web page rather than opening images in a new window. Current popular browsers such as Mozilla Firefox and Internet Explorer still retain interface features that were found in Mosaic, such as the back, forward, refresh, and print buttons.

By the early 1990’s, many Americans were online. They were able to access the network through Internet Service Providers such as CompuServ or America Online, and the majority of online traffic was available through com-

mercial network providers rather than government networks. Other countries, such as Canada and New Zealand, were coming online, and search engines, which search for information on the web, were gaining popularity. The Internet was ripening for commercialization.

The dot-com bubble

As more people gained access to the Internet, commercial demand for web presence also grew. When marketers saw the potential for selling goods directly to consumers online instead of at a physical location, the web went crazy. In the late 1990's, hundreds of new startups were being created every day, most of which operated at a loss in order to gain market share. The prevailing idea amongst these startup companies was that they could charge little or nothing for their product or service initially, but would be able to charge later as their customer base grew. Obviously, such a business structure was unsustainable. One example of this was Boo.com, which spent $188 million in just six months in an attempt to start an online fashion store. The company went bankrupt.

Eventually the rapid growth was unsustainable, and in 1999–2000 the bubble burst. The NASDAQ composite, which tended to be technology-heavy, peaked at over 5,000 points at the top of the boom in 2000 and fell to just over 1,000 points two years later (NASDAQ, 2011).

The Mobile Web

Between 2008 and 2010 the web experienced a huge surge in mobile devices accessing the Internet. This was due, in part, to the rapid increase in the availability of smartphones that use mobile browsers, enabling users to access the Internet from anywhere, anytime. Wireless Internet access had also become prevalent, becoming a basic part of many carrier networks' phone plans.

The rapid growth of location-based services, such as foursquare and Facebook, have also increased the popularity of accessing the Internet from mobile phones. Users are able to tell their friends via social networks where they are and what they are doing. Online shopping from mobile phones has also increased greatly, with over 3.4 billion dollars in purchases being made from mobile devices in the U.S. alone in 2010 (ABI Research, 2010).

Because the screens of most mobile devices are so small, mobile browsers usually require a specially formatted web page in order to be viewed easily. While mobile browsers still have limitations, many web designers have begun to use a programming language called JavaScript that automatically reformats pages based on which device is viewing the page.

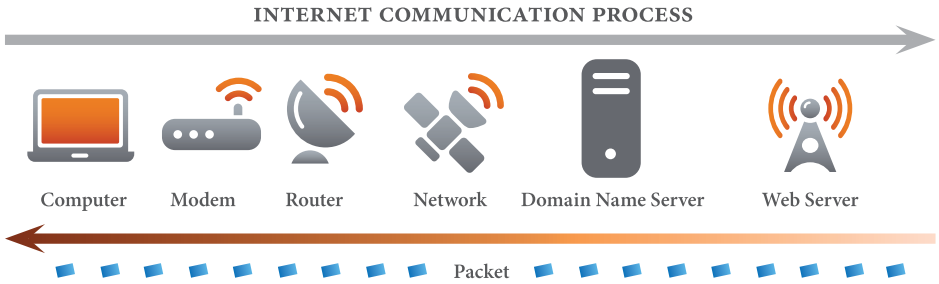
Many mobile browsers have trouble playing various video file types. Large video sharing sites like YouTube and Vimeo have made advances in video technology, creating new mobile formats that play well on mobile browsers.

More recently, tablet computers have also contributed to the rise in mobile web access. The popularity of Apple's iPad tablet launched in 2010 spawned a sea of new tablet computers and operating systems. These devices usually have browsers that are slightly more capable than a phone browser, but they still usually lack all of the features of a desktop browser. Many web technologists believe that the mobile web and mobile computing will continue to grow in popularity.

How the Internet Works

Imagine that you have just opened up your laptop and launched a browser. You browser opens to a search engine, which you have set as your Home Page. You just recorded a television program about the blobfish, but your roommate turned off the recording before it got to the mating rituals. You are fascinated by the idea of such an ugly creature mating, so you type, "What are the mating rituals of the blobfish?" into the search field. When you hit "Enter," this is what happens:

Blobfish



Internet Service Providers

In order to connect to the Internet, you must first have access to an Internet Service Provider (ISP). As we learned, in the early days of the Internet, access was limited to government research laboratories and universities. While government ISPs still exist, thousands of commercial ISPs have cropped up in the private sector, making the Internet accessible via telecommunications networks. Your ISP grants you access to its network through a modem.

One important term to understand in the world of ISPs is "bandwidth." The term has become somewhat ambiguous among electronic devices in recent years because of the distinction between network bandwidth and analog (non-digital) signal bandwidth. Network bandwidth refers to the net bit rate or average rate of successful transfer through a network path at any given time. In wireless communication, bandwidth can refer to analog signal strength that is measured in hertz. To further confuse the issue, many web-hosting providers use bandwidth to describe the amount of data transferred to and from their web-hosting server over the period of a billing cycle. Other providers refer to this measurement as "data transfer".

Modems

When your request leaves your computer, the modem is the next link in the data path on the Internet. The word "modem" stands for "modulator-demodulator." The basic function of a modem is to produce a signal that can be transmitted and decoded easily. Modems modulate an analog signal to encode digital information, and then demodulate the signal to decode the transmitted information. While most people are familiar with modems as a means for connecting to the Internet, modems can be used over any means of transmitting

analog signals, from light emitting diodes (LED) to radio. Internet modems convert the digital data of a personal computer into modulated electrical signals in the voice frequency range of a telephone channel. These signals are transmitted over telephone lines and demodulated by another modem at the receiver side to receive the digital data.

Routers

Routers are the next step in the Internet data transmission path, and their main purpose is to forward data packets between telecommunications networks. Think of a router as an electronic railroad switch, routing information based on where the conductor says it needs to travel. A router is connected to several data lines from different networks. When data comes in on one of the lines, the router reads the address information in the packet to determine its ultimate destination. Then, using information in its routing table or routing policy, it directs the packet to the next network on its journey. The data packet is then forwarded from one router to another until it gets to its destination node (in the case of our search, the search engine's web server).

The most familiar type of routers are home and small office routers that simply pass data, such as web pages and e-mail, between the home computers and the owner's cable or Digital Subscriber Line (DSL) modem, which connects to the Internet. However, more sophisticated routers include enterprise routers, which connect large business or ISP networks to core routers that forward massive amounts of data through fiber-optic lines.

Domain Name Server

Next, our search would come to a domain name server. The most important function of the Domain Name Server (DNS) is to translate the domain name (for instance, cnn.com) into the domain name's corresponding Internet Protocol (IP) address (for instance 10.2.111.189). While not every place on the web has an associated domain name (with letters, which humans can remember more easily), every place on the web does have an IP address (with numbers, which we have a harder time remembering). Domain names mainly exist so that the human mind can remember where to go on the Internet. Now our

search knows which IP address to find in order to get to the correct web host. We're one step closer to our information about the blobfish mating rituals!

Web Servers

Once the domain name server has located which IP address to go to, our request can travel to the web server of the search site. The request will usually be passed to a server-side script on the web server located at the IP address. These scripts are used to create HTML documents "on-the-fly" as opposed to returning fixed documents. This is different from client-side scripting in which scripts are run by the web browser using technologies such as JavaScript. The advantage to server-side scripting is the ability to customize the response based on the user's input. In our case, the server-side script will display a web page based on what we entered in the search field (we will discuss server-side scripts and coding languages in greater detail later.)

Server-side scripting generally relates to dynamic content, or content that changes based on interactions from the user that retrieves and/or modifys information from databases. Server-side scripts are never visible to the browser, as these scripts are executed on the user's computer's server and emit HTML corresponding to user's input to the page. Static content, on the other hand, has no interaction with other data sources.

Large companies such as Google usually own and operate their own web servers. However, most small, light traffic websites rent server space from a web-hosting provider. Web hosts are companies that provide space on a server that they own or lease for use by their clients, and they provide Internet connectivity, typically in a data center.

There is a wide spectrum of web-hosting services. The most basic is web page and small-scale file hosting, where files can be uploaded via File Transfer Protocol (FTP) or web interface. These basic packages usually have limited features and can only handle low traffic volumes. Many ISPs offer this service free to their subscribers. Personal website hosting is typically free, advertisement-sponsored, or inexpensive. Business website hosting usually has more features and can handle high traffic volume, but comes at a higher expense.

At this point, the Google web server receives your request for information about the mating rituals of blobfish and runs code that queries its databases for the results of your search. When it finds your search results, it sends them back to you in

packets.

Packets

Information you request from search engines travel in packets. A packet is essentially a formatted unit of data carried by a packet mode computer network. The advantage of transmitting data in packets is that the bit rate of the communication medium can be better shared among users than if the network were circuit switched, in other words, you'll get your blobfish mating ritual search results faster.

Important Internet Organizations

W3C

The World Wide Web Consortium (W3C) was created to ensure compatibility and agreement among industry members in the adoption of new standards. Prior to its creation, incompatible versions of HTML were offered by different vendors, increasing the potential for inconsistency between web pages. The consortium was created to get all those vendors to agree on a set of core principles and components that would be supported by everyone.

Tim Berners-Lee founded the World Wide Web Consortium (W3C) at the Massachusetts Institute of Technology Laboratory for Computer Science (MIT/LCS). Today, the group is comprised of member organizations, a full-time staff, and participants from the public who work together to develop web standards.

Starting in 1997, W3C created regional offices around the world; as of September 2009, it has 18 world offices covering Australia, the Benelux countries (Netherlands, Luxembourg, and Belgium), Brazil, China, Finland, Germany, Austria, Greece, Hong Kong, Hungary, India, Israel, Italy, South Korea, Morocco, South Africa, Spain, Sweden, and the United Kingdom and Ireland (World Wide Web Consortium).

ICANN

The Internet Corporation for Assigned Names and Numbers (ICANN) is a non-profit corporation headquartered in Marina del Rey, California, that was created in 1998 to oversee a number of Internet-related tasks previously performed by other organizations on behalf of the U.S. government. ICANN is responsible for managing the Internet Protocol (IP) address spaces (IPv4 and IPv6) and the assignment of address blocks to regional Internet registries, for maintaining registries of Internet protocol identifiers, and for managing top-level domain name space (DNS root zone), which includes the operation of root nameservers. Most visibly, much of its work has concerned the introduction of new generic top-level domains (TLDs). Top-level domains are the highest level in the domain system hierarchy. For example, in the domain www.suu.edu, the top-level domain would be ".edu."

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Terminology Review

- ARPANET—The Advanced Research Projects Agency Network
- HTML—Hypertext Markup Language
- ICANN—The Internet Corporation for Assigned Names and Numbers
- W3C—World Wide Web Consortium
- IP address—Internet Protocol address, consists of numbers
- FTP—File Transfer Protocol
- HTTP—Hypertext Transfer Protocol
- Modem—modulator-demodulator
- Network bandwidth—The net bit rate or average rate of successful transfer through a network path at any given time
- Router—Forwards data packets between telecommunications networks
- Packet—Formatted unit of data carried by a packet mode computer network

Chapter III

WRITING FOR THE WEB

Writing has distinct differences and challenges in every medium. Writing for the web can be challenging because it requires specialized and somewhat technical knowledge. The way web copy is structured impacts not only the way it appears to the user but to other computer systems, like search engines and web indexes, as well.

Guidelines

Accessibility, usability, and findability

Three fundamental considerations unique to writing for the web are accessibility, usability, and findability. Accessibility refers to the ability of a product to be used by as many people as possible, including users who are visually impaired or blind, illiterate, or learning-disabled. Blind or visually impaired users are able to use the web through screen-reading software. Screen readers attempt to identify and interpret what is being displayed on the screen. This interpretation can then be sent to a braille output device or heard through text-to-speech icons. Screen readers rely on visible text and other text associated with the images and videos that appear on the page to describe what the page looks like and how a user should interact with it. A web writer must be able to identify these key points of description and create copy that gives impaired users adequate information to navigate.

Accessibility is becoming a more common requirement and many organizations have created disability policies that require their websites to be compliant with the American Disabilities Act. In the United States, government websites are required to meet these standards (American Disabilities Act, 2003).

An important part of a web writer's job is contributing to the usability of the website. Usability refers to making a web page more user-friendly by using meaningful text to describe web navigation and click-through processes. In some cases, reducing the overall amount of text on a page can make it more meaningful. For instance, the Google.com home page uses minimal text.

The page consists of a logo, a search bar, and a short message. The purpose of the page is obvious, whereas the purpose might be more obscure if it were a text-heavy page.

The text on a page must quickly and intuitively guide users to the information they need. In some ways, navigating a website can be like going into a maze. Users may have a general idea of the direction they want to go, but it can be easy to get off-track and waste time trying to reach their ultimate goal. A web writer's responsibility is to provide hints and signals to guide people through the maze so they can easily find the content they seek.

Users tend to have little patience for not being able to find the information they need, and if it's difficult, they will leave your website because they can usually find it somewhere else. One of the best ways to guide them is with hyperlinks. Think of hyperlinks as shortcuts through the maze. Hyperlinked text takes users to other pages and documents within the same website or on another website. Hyperlinks called "anchor tags" can also take the user somewhere on the same page by jumping to a particular vertical point on the page. In addition to the general navigation, the use of hyperlinked text within body copy can increase findability on your website.

Findability refers to how easily users can find the information they need on a website, as well as how easily a search engine is able to find your website. Search engines use hyperlinks as one way to find content on the web. When a search engine analyzes the data on a page using programs sometimes referred to as "spiders" or "bots," it identifies the hyperlinks it encounters and records the pages that the hyperlinks are linked to. It then stores those hyperlinks and uses the list to determine which sites to crawl next. Search engine results are ranked based on a number of factors, including site age, the amount of content, the number and ranking of inbound hyperlinks, trends, and metadata like domain names and keywords.

User-centered approach

User-centered design philosophy is focused on the needs and wants of a user. User-centered designers attempt to foresee how a user will interact with a product. In web design, this philosophy is particularly applicable to writing, because the language of the site should fit the user's profile to make interaction easy and familiar. For instance, an educational website for underprivileged

youth may want to avoid verbose, academic words and use more contemporary, conversational language.

User-centered design is based on the rhetorical situation model, which is comprised of three main elements: audience, purpose, and context. The audience is the person using the website. The purpose is whatever action the website is attempting to persuade the user to take. Context describes the circumstances surrounding the process. Context can be established by asking questions, such as, "Why is someone visiting this website? What situation prompted the need for the visit? What are the social circumstances surrounding this person?"

In order to answer some of the previous questions, a writer can employ some of the tools of user-centered design, such as personas, scenarios, and use cases. A persona is a fictional character that exhibits the applicable characteristics and attributes of the user. Personas are useful because they help create a consistent image of the target market that can be identified by each member of the design team. Personas can be developed after gathering data through research, including observation, qualitative inquiry, one-on-one interviews, questionnaires, and focus groups. Depending on the level of research that is required, a secondary persona can be created. Secondary personas exhibit the attributes of a user that may be second in priority to the primary user.

A scenario is an attempt to add context to the persona by creating a fictional "life story" or daily routine for the persona. The story might be a sequence of events that would occur in the average, everyday life of the user. A scenario describes social context and attempts to exemplify the actual world that a user is experiencing. As with personas, it is important to base scenarios on data gathered from viable research, not just what a handful of people think a user's environment might be like.

Use cases are a tool that help identify how a user will actually use the text on a website by describing the interaction between individuals and a product. The interactions may occur for a short period of time but can still consist of intricate details and actions. It is represented as a series of simple steps the user will take to achieve his or her goal, in the form of a cause-and-effect scheme. Kenworthy (1997) outlines eight steps to developing use cases:

1. Identify who is going to be using the website.

2. Pick one of those actors.
3. Define what that actor wants to do on the site. Each thing the actor does on the site becomes a use case.
4. For each use case, decide on the normal course of events when that actor is using the site.
5. Describe the normal course in the description for the use case. Describe it in terms of what the actor does and what the system does in response that the actor should be aware of.
6. When the basic course is described, consider alternate courses of events and add those to "extend" the use case.
7. Look for commonalities among the use cases. Extract these and note them as common course use cases.
8. Repeat the steps 2 through 7 for all other actors.

Planning

Defining primary and secondary purposes of web content

A website may have general goals, but each page will have its own set of independent goals. Defining these goals can be easy, such as in the case of a contact page. This page usually has a clear primary goal: to get someone in contact with you. The text on the page should be focused around helping the user contact you in whatever method you have provided (contact form, telephone number, etc.). A page can also have a secondary focus. In the case of the contact page, a secondary focus might be to let the user know where you are located. Embedding a simple map on the page could do this. The easiest way to define primary and secondary content goals is to make a list of possible goals for a page and then prioritize the list, paying most attention to the top two items.

Identifying a target audience and reading level

You can go into great detail identifying a target audience, but in order to communicate effectively you should collect some basic demographic and psychographic information. Typical demographic information includes age, gender, occupation, household income, marital status, and geographic location. Psychographic information can include more intangible attributes, such as the need for elevated status, ethics, risk-takers vs. conservative, or spendthrift vs. money hoarder. Identifying some of these attributes should allow you to estimate the target audience's average reading level and reading habits. For instance, a site for children would obviously require a low reading level. Conversely, a site geared towards users with higher education might require more literary sophistication.

Developing user personas

As we mentioned earlier, personas are imaginary users of a website that represent the needs of larger groups of users in terms of their goals and personal characteristics. They act as stand-ins for real users and help guide decisions about functionality and design. Personas can help identify the users' motivations, expectations, and goals that are responsible for driving online behavior.

Although personas are fictitious, they are based on knowledge of real users. Some form of user research is conducted before they are created to ensure they are a true representation of the end users rather than the opinion of the person developing the personas. Personas brings users to life by giving them an identity—names, personalities, and often photos.

Consider the following persona created for an outdoor supplier website based in Colorado:

Doug is a 32-year-old family man living near Denver, Colorado. He, his wife and their three young children live in a modest home in the suburbs. The way he spends his time and his purchasing decisions mostly revolve around his family. Doug is socially and fiscally conservative and tends to save more than he buys.

Doug is very Internet savvy and works for an Internet company. He spends many hours per day online and stays connected to friends and associates mainly through social media. He does all of his shopping and banking online and loves feeling like he's getting a bargain. He likes speed and efficiency, but will wait for an item he wants to go on sale before purchasing it. There are only two things he can justify spending money on that are outside of his familial obligations: new tech and camping supplies for his summer hiking forays into the mountains. In these two categories he doesn't mind spending a little more if he knows he's getting a quality product.

By analyzing what we know about Doug, we can make some assumptions about his web use and online buying habits related to outdoor equipment. Given his Internet savvy he will probably not have any trouble navigating your site, but will be keenly focused on content. He'll take the time to read through product descriptions and wants the details. He wants information to be easily accessible, so links should be named appropriately and keywords should be used repetitively to let him know he's in the right place. Doug is not an impulsive buyer and is not likely to be converted with gimmicky text. It's more important that product descriptions make him feel like he's getting a quality product than a bargain. Keep in mind that he'll read reviews online and compare products. The better you can make him feel about the quality of the camping equipment he's buying, the more likely he is to buy.

Doug and his family

Writing

Voice, tone, and style in web writing

When creating a writing strategy for a web site, it is important to consider the attributes of the target user. These attributes will almost certainly affect the voice, tone, and style of the writing.

An author's voice is his or her personality. It is comprised of writing elements such as syntax, diction, punctuation, dialogue, and character development. It may also be reflected in the choice of subject matter. Using a consistent, unique voice can be a great way to make your web writing easily identifiable and attract readers. Blog writers such as Perez Hilton have successfully attracted large groups of readers online with a distinct, identifiable writing voice.

Voice is also active or passive. Active voice describes an action directly; whereas, passive voice describes the action indirectly. For instance, "The user clicks the Home link" is active, whereas "The Home link is clicked by the user" is passive. Passive voice tends to be somewhat verbose and requires more effort for the reader to understand. Active voice should be used whenever possible for a number of reasons:

- It's easier to understand
- It's more specific: "It's telling me 'I' can do something"
- It maintains the subject/verb/object order
- It tends to be more concise

Voice and tone differ in that voice reflects the personality of the author, and tone expresses a distinct feeling about the subject matter. Tone can be established by answering a few basic questions:

- What is the purpose of this?
- Who is the target audience?
- What do the readers need to understand as a result of reading this?

Tone conveys the author's attitude toward the audience and subject matter. Tone might be described as frivolous or serious, casual or formal, sweet or stuffy.

Style is the way an author chooses to address the audience considering what is appropriate for the circumstances. It reveals how the author perceives the audience and how the author wishes to be perceived. The main factors that contribute to style are situation and purpose. For example, a person writing a letter would use a different style depending on whether it is a letter of complaint to a local business, a letter of condolence to a friend, or a business letter to a colleague. Or, a news website would have a much different style of writing than a website devoted to fashion trends or comedy. The author must decide what the goal of his or her writing is and how best to accomplish it.

Challenges in web writing

Ultimately, most of the challenging aspects of writing for the web are writing for multiple audiences, getting the reader's attention, and helping users navigate. You may be thinking, "I've written for multiple audiences before. The corporate brochure I created for my uncle's business targeted prospects, customers, partners, and investors." However, the web is different. One of the most important audiences on the web is the search engine spider, roaming the web looking for keyword-relevant pages to index in its database. Keyword density, word count on a page, metatags, and the words you use in links are all meaningful to search engines. You don't face these challenges when writing for print media. Sometimes, the most challenging audience might be within the walls of your own company. The CEO, Vice President of Sales, and Marketing Director all have their own idea of what the website needs to communicate and how it should. Because your website is much more than a

corporate brochure and can expand almost indefinitely, you will have a number of internal constituents clamoring to get their message on the website. Add to this mix your main audience of customers and prospects, and you can see conflicts arising. Ideal writing for search engines may not be good for customers and prospects. What's important to the executives may not be relevant to your reader. As the writer, it will fall to you to sort all of these competing needs into one cohesive and functional website.

Upon landing on a web page or opening an e-mail, the majority of users quickly scan the page to determine if it contains information relevant to their needs. They will look only for a few seconds before making a decision whether to stay and read on or to abandon the site or delete the e-mail. Web writers must learn to capture their audience's attention quickly, with a compelling and relevant headline. The copy should also be easily scannable. It is recommended to use the inverted-pyramid style, beginning with the conclusion or most important point, then following with supporting information, background, and details. Secondary headlines (sometimes called subheads), bullets, captions and action-oriented commands can also help users scan efficiently. Without such scanning language to anchor users to your page, they will leave quickly—and never find your beautifully written prose hidden behind the "read more" button.

Books and magazine articles are written and designed to read front to back, beginning to end. Brochures allow jumping around, but it is impossible for readers to get lost because the pages are still in sequential order. On the web, users will scan and click, jumping from page to page, following what interests them. This can cause a user to get lost on your site, especially given the fact that no two websites are alike. Visual highlighting of navigation elements can help orient the user, but the writer is responsible for coming up with clear language on navigation and other links, along with page headlines, to make sure users understand where they are on the website and where to go next.

Reworking existing copy from print sources for web use

A common task of web writers is to take content from print sources and include it in a website. Small businesses tend to begin with hand-distributed printed materials, such as flyers and brochures, and then transition to the web as business expands. When transitioning content from print to web, as with

writing original content, it is important to keep a few familiar things in mind:

- Convert passive voice to active voice whenever possible
- Use the inverted pyramid. In print, the reader is interacting differently and you have more time to communicate. A person picking up a brochure or pamphlet is more likely to read the text than on a website. The user is needs to be able to get more information in less time. Eye-catching, interesting "hooks" are vital to getting people to read your content. One advantage of the web is that the inverted pyramid can descend infinitely, unlike a print document with a finite number of pages. If something needs more explanation on the web, you can create a page or many pages that go into as much depth as you would like.
- SEO. A brochure isn't worried about being found on a search engine. Figure out a way to include important keywords and phrases.
- Print documents tend to be linear, as in people read from left to right, start to finish. You can take time to build a story. On the web, each section needs to make sense independent of any of the other sections, because you don't know where a user will enter the site or what page they were on previously.

Writing meaningful link text

In order to make hyperlink text accessible to impaired readers, it must be meaningful. Without being able to see it, readers need to understand what the link points to, and the text in the link itself needs to make sense. A typical method for adding a link to a file is to copy a URL from the location bar of a browser and simply paste it where you want it in your document—and many programs, such as Microsoft Word, recognize certain text as a URL and automatically convert it to a link with the URL as the link text. The URLs, though important in and of themselves, become an afterthought in how they are presented to readers.

In its Web Content Accessibility Guidelines, the World Wide Web Consortium has a simple recommendation concerning link text: "don't use 'click here'" (World Wide Web Consortium, 1999). The main reason for this guideline is because the phrase says nothing about what the link points to; it is not meaningful to the user without additional text. A link is most meaningful when it makes

sense out of its usual context.

As we mentioned in the accessibility overview, many people who have vision problems use screen readers to navigate web pages. Instead of having an entire web page read to them, these users can click the Tab key to jump from link to link. In turn, the text of each link is voiced to the user as "link, [link text]." Sequential links with the text of "click here" and "read more," for example, would thus come back to the screen reader user as "link, click here" and "link, read more." This information provides little value to the user out of context, as it provides no clues regarding where the link goes.

Some screen readers provide a list of links for the user as an additional way to navigate a web page. The links list might list all the links on a page, all the links on a page that the user has visited (or not visited), or even a list of links that contain certain information requested by the user, such as all links on a page that point to the www.suu.edu domain. With vague link text, a link list could very well end up reading like this:

- Read more
- Click here
- 3 comments
- More information
- Visit
- Download
- Watch now
- Transcript

There is one good attribute about all the link text examples mentioned so far: They all clearly meet the requirement of being short. These examples, however, are probably too short. With just a little more information, the links would likely have been able to stand alone.

Consider a resume-like web page that lists the various major resume categories (education, experience, etc.) on separate pages, accessible via links on the main page. A link worded as "Work Experience" is much shorter and more succinct than a link worded as "Page that explains more about my work experience"; the former link text is also more useful in part because it mentions the important information first. Likewise, "Work Experience" is more informative than just "Experience" because it specifies what kind of experience will be

described; the reader will not confuse it with possibly being about teaching, educational, volunteer, or computer experience.

So, what can you use instead of "click here"? Clear, specific, and informative text like "SUU home page" or "JCMC Fall Conference Schedule" or even "research procedures" are much better alternatives. Such examples mean that you may have to change the way you write your text when you add links. The following table lists some examples of ways link text could be improved (Pollack, 2008):

Instead of this link text:	Use link text like this:
A transcript is available.	Read the Lesson 1 video transcript.
I have prepared a number of writing tips for you to review when you compose your paper. Read them now.	Take advantage of these writing tips as you compose your paper.
Guidelines are available for the term papers that are due next week. More information…	Be sure to review these important term paper guidelines before you turn in your paper next week.
I have posted answers to the quiz here.	I have posted answers to the quiz on a separate page.
Stephen D. has some interesting video about distance learning on his website. Watch videos here.	Stephen D. has some interesting videos about distance learning on his website.

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Terminology Review

- Markup—A system for annotating text
- Accessibility—The degree to which a product, device, service, or environment is available to as many people as possible.
- Usability—The ease of use and learnability of a human-made object.
- Findability—The ease with which information contained on a website can be found, both from outside the website (using search engines and web indexes) and by users already on the website.
- Screen reader—A software application that attempts to identify and interpret what is being displayed on the screen for visually impaired users.
- Metatag —Element used to provide structured metadata about a Web page.
- Active voice—Active voice is used in a clause whose subject expresses the agent of the main verb.
- Passive voice—Passive voice is used in a clause whose subject expresses the theme or patient of the main verb.
- Hyperlink—A reference to data that the reader can directly follow or that is followed automatically.

Chapter IV

INFORMATION ARCHITECTURE

Information architecture is the structural design of information. It is used for a broad spectrum of disciplines, including library systems, database development, and technical writing. In web design, information architecture is a step in the planning process that identifies how users will access information. Good information architecture is built on thorough research and understanding of how users will want to interact with a website.

Information Architecture

Information architecture in web design and development

Information or content architecture is the process of structuring how users will retrieve the information they are looking for. To understand the importance of information architecture, consider the information on a website in contrast to the Internet as a whole. The Internet contains vast amounts of information, which is generally found through search engines. Search engine results identify information and organize it in such a way that a user can easily target the desired content. But what if search engines didn't exist? Much of the valuable content available on the Internet might never be found. In the same way, content on a website does no good unless there is a way to find it.

A good example of the value of information architecture is the case study of the Children's Hospital of Pittsburgh website. Like many institutional organizations, their site had mountains of valuable content but had grown to the point where it was no longer easy to navigate and lacked the personal feel that board members felt a hospital website should convey.

before

after

The hospital hired a digital strategy firm to help them improve content architecture on their website. After conducting interviews with stakeholders—the site users such as physicians and patients—and doing a competitive analysis, the firm identified ways to re-prioritize content and navigation to make the experience more efficient. They presented user personas, wireframes, and a site architecture diagram to the stakeholders to illustrate the intended changes. When the changes were approved, the firm then created a content-conversion document outlining the scope and requirements for the team of web designers, copywriters, and developers who would be working on the project. The result of this information architecture redesign was a more visually engaging site with a warmer, more personal feel than the previous interface. The new layout makes it easy for the user to easily identify the commonly accessed sections of the website and uses keyword-heavy hyperlinks to improve SEO (Musuraca, 2010).

Information architecture in the web design process

Web design projects are generally made up of seven steps. The process may differ slightly depending on the approach (iterative, agile, etc., which we will discuss in greater detail in the next module), but it should always be comprised of these components:

1. Define project requirements
2. Conduct research and analysis
3. Develop design
4. Build
5. Test
6. Deploy
7. Maintain

The "heavy lifting" of the information architect takes place in the first three stages of the development process. He or she will be heavily involved in the research and analysis, and therefore should provide input throughout the process. The information gathered is integral to the project because it will guide the structural design of the website.

Research

Research is a vital part of any web design project. Methods differ but tools commonly used by information architects include client interviews, creative briefs, and competitive analyses.

Client interviews

Client interviews are great not only for establishing relationships but also for getting inside the head of a client. While interviews can be done over the phone, face-to-face is usually preferable. The interview doesn't need to be formal, but it should be a direct, open conversation about the vital aspects of the website.

The primary purpose of a client interview is to establish the scope of a project in order to begin requirements documentation. It should not cover the detailed information that will be covered in the creative brief, but instead give a broad picture of project budget, timeline, general goals, etc.

Getting a realistic idea of the scope of a specific project is vital, and it can be very difficult. You may use a project request form that the client fills out about elements of the project, or you may collect project specifications informally via telephone or e-mail. Regardless of the format, the client interview should provide answers to some general questions:

1. What is the budget?
2. What is the timeline for completion?
3. Who is the audience?
4. What are the goals/objectives of the project?
5. What are the deliverables that are expected?
6. What are the expectations in terms of responsiveness and meeting milestones?
7. What are the expected results?
8. What is the background of the project (is it brand new, was it started

previously)?

9. Does the client have preferences or guidelines for the project?
10. Will the client want regular status check-ins? How frequently?
11. Will there be any training, follow-up, or support necessary after the completion of the project?
12. Who is the contact person?
13. Who is the decision-maker?
14. Who else needs to be involved in the project?

For those working in an agency with client discretion (i.e., the ability to choose whom to work with), this interview is a good opportunity to consider whether the agency's offerings are a good fit for the client's needs. "Weeding out" potentially troublesome clients early on in the process can save a lot of time, money, and grief. When possible, selecting clients that are a good match for the agency will increase the likelihood of success and help bring in more business because the clients are happy. Being a little bit picky in the client acceptance process is not a bad thing; it puts both the agency and the client in a position for long-term success and will likely lead to a more positive working relationship. Some questions to ask to determine if clients are a good fit for the agency include (Gregory, 2009) the following:

1. Who is the client and what do they do?
2. Do the services they need mesh with what the agency offers?
3. Do they understand the type of services the agency offers?
4. Do they understand agency rates (and not question them)?
5. What are they looking for in a provider?
6. Do they understand the agency's work process?
7. What is their communication preference?
8. Are there any hurdles that will be difficult to overcome (i.e., separated by several time zones)?
9. Do they seem to respect the agency?
10. What type of reputation do they have?
11. What is their general availability?
12. Do they have a sense of humor or are they all business?

The creative brief

The creative brief is an opportunity to dive into the project a little deeper following the client interview. Creative briefs are used all across the spectrum of marketing and creative services, but the questions in a creative brief will be different depending on what the project is. A creative brief for a website will have different answers to the questions than a 30-second television commercial. The primary focus of the creative brief is establishing qualitative data that will contribute to the overall aesthetic value of the site.

The brief will include much more than just demographic information—consider the profile of "rich men over the age of 35." That group could include Clint Eastwood, Richard Branson, or President Obama, each very different people. The creative brief should record qualitative attributes of the client's service or business, which can be identified by asking questions such as "How do your customers feel about your product? What kind of emotions are involved in the buying process? What kind of car do they drive? What are their dreams and fears?"

The following is an example of a common outline for a creative brief (gotomedia, 2011).

The Creative Brief Worksheet

Project Summary: State general project information, goals, and relevant background information for site redesign. This paragraph should be a statement overview of the project as a whole.

- What is the basic overview of the project? Briefly include background information if relevant.
- What is the single purpose of the new site?
- What are the secondary goals of the new site?
- What are the long-term goals?

Audience Profile: Profile the target audience. Provide enough detail to enhance everyone's understanding of who the audience is. Include some user demographic information. The goal of this section is to answer the following: Who is the target? What do they care about? And what do they do online on

a daily basis?

- Who is the target audience? Choose a typical user and profile in detail. Include occupation, age range, gender, online frequency, online activities, and any other relevant information. Profile more than one if applicable.
- What is a typical task the user might perform on the new site? For example: register, log-on, search for information, buy a specific product, send their e-mail address, call for more information, etc.

Perception/Tone/Guidelines: How should the target audience to respond to the new online presence?

- What does the target audience currently think and feel about the company and the current website?
- What does the client want them to think and feel?
- How will this new website help to achieve this goal?
- What adjectives can be used to describe the way the web site and company should be perceived?
- What are some specific visual goals the site should convey?

Communication Strategy: How will the website persuade the user?

- What is the overall message that needs to be conveyed to the target audience? For example: cost-effectiveness, security, reliability, efficiency, etc.
- How will the overall message be conveyed? For example: effective messaging through copy, directed path towards goal, specific offer on homepage, etc.
- Identify stages of development (if appropriate) used to execute goals.
- How will success of the redesigned site be measured?

Competitive Positioning: How is your client different from his or her competition? What are the factors that will make the project a success?

- How is the company or its web presence different from the competition?
- What specifically sets the client apart from the competition?
- What areas of the current site are successful and why?

Competitive Analysis

Understanding an existing website's position in the competitive landscape is essential to making decisions throughout the redesign process. Competitive analysis is an exploration of the companies in a given industry sector or market niche that are competing with the client's products or services for market share. The analysis may be an in-depth exploration of the top five competitors, or a larger number of competitors could be examined in less depth. In most cases, the client will have identified important competitors already. In web design, this analysis is generally a side-by-side comparison of competitor's content and functionality. A complete competitive analysis will help identify core content/functionality that competitors have in common, as well as features that may be unique to the strongest competitor(s).

A simple way to conduct competitive analysis is to identify features common to competitor's websites and chart their features using a spreadsheet as shown below. This is a sample analysis of the "Online Giving" portion of a nonprofit website. In a full analysis, the information architect would create a similar chart for each applicable section or feature of a website (Withrow, 2006):

	Competitor 1	Competitor 2	Competitor 3	Competitor 4
Online giving	Y	Y	Y	Y
General support	Y	Y	Y	Y
Program-specific support	Y	Y	Y	Y
In memory of another	Y	Y	Y	Y
For a special event	Y	Y	Y	Y
Gift Club		Y		
Offline giving	Y	Y	Y	Y
General support	Y	Y	Y	Y
Program-specific support	Y	Y	Y	

	Competitor 1	Competitor 2	Competitor 3	Competitor 4
In memory of another	Y	Y	Y	Y
In honor of another	Y	Y	Y	Y
For a special event	Y	Y	Y	Y
Corporate sponsorship	Y	Y	Y	Y
Planned giving	Y	Y	Y	Y
Major gifts	Y	Y	Y	Y
Employer Matching	Y	Y	Y	Y
Stock		Y	Y	Y
Endowment		Y	Y	Y
Gift Club		Y		

Content: Organization and Structure

Content inventories and audits

A content inventory is a quantitative analysis of website content, while the content audit is a qualitative analysis of the information found in the inventory. The inventory identifies the information that is there; the audit asks whether it is any good.

You might be wondering: Shouldn't a client already know what is on his or her own website? Unfortunately, the answer is no surprisingly often. Many websites were initially created without the aid of a Content Management System (CMS, which we will discuss in a later chapter) and have grown over the years by multiple contributors using different web design methods. Long forgotten programmers might have used outdated techniques to allow content

to appear on remote pages, making it difficult to locate and retrieve the actual content on the page. The client knows that their website is a mess and wants to consolidate it into a CMS to make it easier to maintain. The question is how to begin? The answer: a content inventory.

A simple content inventory can be created in a spreadsheet or database. List all of the pages in the website directory in the first column on the sheet. Then in the corresponding columns, list different attributes of the content on that page. This approach accomplishes two things: it creates a list of each content section on the website, and it provides a snapshot of the content that exists and how it is organized.

As the spreadsheet progresses, patterns will emerge in the content. For example, elements that comprise specific types of content such as newsletters can be identified by their issue date, or press releases containing media contact information. Inventorying content in this manner can be a mundane, overwhelming task. It is not uncommon for even a relatively small website to have 500+ pages. However, it is important that a living person perform the content inventory. Having a programmer index each of the files in a directory can be helpful, but a human eye is best to evaluate content. To complete a more detailed content inventory, web user experience pioneer Jeffery Veen offers additional attributes to identify (Veen, 2002):

- Link ID: When doing a content inventory, we create a numbering system as we move through the site. It helps us refer back to particular sections and pages as we fill in the spreadsheet. In the sample Excel file, you'll see that "Products" is the second section of the site we've been analyzing, and the pages under the Product page are numbered accordingly. A system like this can prove invaluable later in the process when writing functional or interface specifications.
- Link Name: The content you are evaluating needs to be called something. We usually just use the title of the HTML doc, or if that's not specific enough, the headline from the content. It should be unique and descriptive.
- Link: It can be very useful to record the URL of the piece of content you're looking at—not only can you click and navigate from the spreadsheet, but you've also captured the canonical location of the document on the web server. Remember, the URL should point to the location of the actual HTML file, not a symbolic link or redirect.

- Document Type: What template does the page use, or which should it? Is it a product page, or a legal brief, or a press release? Every site will have different types of documents, but most have fewer than a couple dozen.
- Topics, Keywords: What is the content about? View the source of the page and see what, if anything, is in the "keywords" metatag. Ideally, you would develop a controlled vocabulary—a collection of approved keywords used to describe your content. This not only helps you choose the appropriate descriptive words, but also keeps your metadata in check. With a controlled vocabulary, you can avoid having half of your content creators labeling transportation stories with "trains" and the other with "locomotives."
- Owner, Maintainer: Who created this content? Who maintains it? If you run a smaller site, this may be you, so you might ignore this. With our corporate clients, we assign responsibility for every piece of content.
- ROT: This acronym stands for Redundant, Outdated, or Trivial. It's a tag we use to identify content that should possibly be removed from the site. Is there another copy of this content somewhere else? Is it no longer timely? Maybe it should never have been posted in the first place? If it doesn't belong on the site any more, make a note here. This is stuff that shouldn't make the jump to your new database.
- Notes: Anything else you may notice. Things to include here are issues like broken images, or other HTML problems. Really just try to record anything you want to remember for later.

	A	B	C	D
1	**Link ID**	**Link Name**	**Link**	**Document Type**
2	2.0.0	products	http://www.xyz.com/products/index.htm	collector page
3	2.1.0	software	http://www.xyz.com/products/software/	collector page
4	**2.1.1.0**	**internet software**	http://www.xyz.com/products/internet/in	paragraphs
5	**2.1.1.1.0**	**server products**	http://www.xyz.com/products/servers/in	paragraphs
6	2.1.1.1.1	web server	http://www.xyz.com/products/servers/we	paragraphs
7	2.1.1.1.2	mail server	http://www.xyz.com/products/servers/m	paragraphs
8	2.1.1.1.3	portal server	http://www.xyz.com/products/servers/po	paragraphs
9	2.1.1.1.4	press releases	http://www.xyz.com/pressreleases/serv	paragraphs
10	2.1.1.1.5	events	http://www.xyz.com/events/2002.html	paragraphs

Card sorting

Card sorting is a user-centered design method for increasing a system's findability. The process involves sorting a series of cards, each labeled with a piece of content or functionality, into groups that make sense to users or participants. According to Information Architecture for the World Wide Web, card sorting "can provide insight into users' mental models, illuminating the way that they often tacitly group, sort and label tasks and content within their own heads." The process identifies patterns in how users would expect to find content or functionality. Those patterns are often referred to as the users' mental model. By understanding the users' mental model, web designers can increase findability, which in turn makes the product easier to use.

There are two types of card sorts: an open card sort and a closed card sort. In an open card sort, participants are asked to organize the cards into groups that make sense to them and then name each group. In a closed card sort, participants are asked to sort items into pre-defined categories. An open card sort is typically done to discover how users group content and understand the terms or labels they would give each category. A closed card sort typically works best when working with a pre-defined set of categories; it will reveal how users sort content items into each category. Conducting an open card sort first will identify categories of content, then a closed card sort will show how well the category labels work.

Conducting a Card Sort

Getting the Cards Ready

1. List the content topics or types of information that are likely to appear on the site, if it's a new site, or list the most important/popular types of content on the current site. To create this list, begin by reviewing the content listed in the content inventory. Next, identify the most important or most frequently used content.
2. Write each topic on a separate index card. (Hint: Use self-adhesive labels and a word processor. The cards will be neat, legible, and consistent. Also, the list of topics in the computer will be available for later analysis.)

3. Limit the sort to 100 cards or less. (About 50 is a good number.)
4. Have blank cards available for participants to add topics and to name the groups they make when they sort the cards. (Hint: Consider using a different colored card for having participants name the groups.)
5. Number the cards in the bottom corner or on the back. (This helps when analyzing the cards.)

Arranging Cards for Sorting Sessions

1. Plan about one hour for each session—longer if there are several cards.
2. Arrange for a space where the participant has enough room to spread the cards out on a table. A conference room works well.
3. Plan to have someone take notes as the participant works and thinks aloud.
4. As with other techniques, arrange for payment or other incentives to thank the participant for their time and effort.

Sorting Session

1. Show the participants the set of cards and explain that they are helping to identify what categories of information should be on the site's home page and what those categories should be called. Explain that they should group the cards in a way that makes the most sense to them and when they are finished grouping the cards, they will be asked to provide a name for each group of cards.
2. Ask the participants to talk out loud while working. (This is the same technique used in usability testing.) Take notes of what participants say to better understand their thoughts and rationale if needed later during the analysis.
3. Let the participants work. Also, let them add cards—for example, to indicate lateral hyperlinks or additional topics. Let the participants put cards aside to indicate topics they would not want on the site. Minimize interruptions but encourage the participant to think aloud.
4. At the end, if the participants have too many groups for the home page, ask if some of the groups could be combined for the home page.
5. Give the participants a stack of different colored cards and ask them to

use the colored card to name each group. What words would the participants expect to see on the home page or second-level page that would lead them to that particular group of content items?

6. At the end, thank the participant and give the payment or other gift (if promised).

Analyzing Data

- Use the numbers on the cards to quickly record what each participant has done. Write down the names that participant gave to each grouping and the numbers of the cards the participant included under that name. Then you can reshuffle the cards for the next session.
- For a complete picture of the detailed site diagram each user has created, create a computer file for each session. Working from the original list of topics, move topics around to recreate each participant's groupings and enter that participant's name for the groupings.
- For a less detailed analysis, use the notes and recordings of the participants' names and card numbers under each person's name to find commonalities from different sessions.
- For a more detailed analysis, consider using an Excel spreadsheet to show the relationship between the cards or use one of the available software programs to analyze the data (Usability.gov, 2011).

As with any other method, card sorting has both advantages and disadvantages. Keeping these in mind will help to determine whether the technique is appropriate for a given situation and provide guidance about how to run the activity. Some of the advantages of card sorting are:

- Simple—Card sorts are easy for the organizer and the participants.
- Cheap—Typically, the cost is a stack of 3×5 index cards, sticky notes, a pen or printing labels, and time.
- Quick to execute—Several sorts can be performed in a short period of time, which provides a significant amount of data.
- Established—The technique has been used for over 10 years, by many designers.
- Involves users—Because the information structure suggested by a card sort is based on real user input, not the gut feeling or strong opinions of

a designer, information architect, or key stakeholder, it should be easier to use and a fairly accurate representation of how users would interact with a site's content.

- Provides a good foundation— It's not a silver bullet, but it does provide a good foundation for the structure of a site or product.

Disadvantages include:

- Does not consider users' tasks—Card sorting is an inherently content-centric technique. If used without considering users' tasks, it may lead to an information structure that is not usable when users are attempting real tasks. An information needs analysis or task analysis is necessary to ensure that the content being sorted meets user needs and that the resulting information structure allows users to achieve tasks.
- Results may vary—The card sort may provide fairly consistent results between participants, or may vary widely.
- Analysis can be time consuming—The sorting is quick, but the analysis of the data can be difficult and time consuming, particularly if there is little consistency between participants' sort results.
- May capture "surface" characteristics only—Participants may not consider what the content is about or how they would use it to complete a task and may just sort it by surface characteristics such as document types (Spencer & Warfel, 2004).

Experience Planning

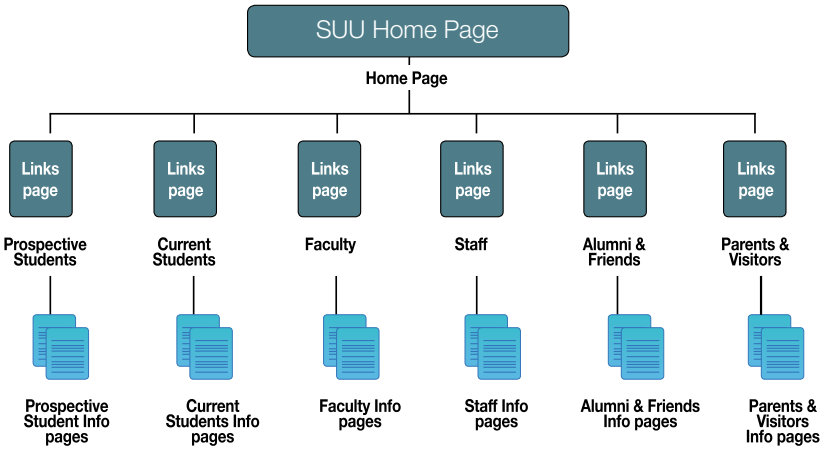
Once proper research has been conducted, experience planning can take place. In this section we will discuss four effective planning tools: site diagrams, wireframes, prototypes, and storyboards/process flows.

Site diagrams

Site diagrams explain site hierarchy in the format of an organizational chart, similar to the kind used to show job hierarchy for employees in large corporations. Major elements of a mature site diagram include the following:

- Content structure and organization: major site content divisions and subdivisions
- Logical functional groupings or structural relationships
- The “click depth” of each level of the site that shows the number of clicks required to reach any given page
- Page type or template (menu page, internal page, major section entry point, etc.)
- Site directory and file structure
- Dynamic data elements like databases, rss, or applications
- Major navigation terms and controlled vocabularies
- Link relationships, internal and external to the site
- Levels of user access, log-ins required, or other restricted areas

Site diagrams start simply and may evolve into two distinct variations: conceptual site diagrams that communicate at a general level the evolving site structure to clients and stakeholders, and more complex blueprint diagrams that are used by the technical, editorial, and graphic design teams as a guide to the structure of both the user interface and the directories and files. These site diagrams can be developed with drawing software such as Adobe Illustrator but are usually developed with specialized diagrammatic software such as Microsoft Visio, ConceptDraw, or OmniGraffle (Lynch & Horton, 2011).

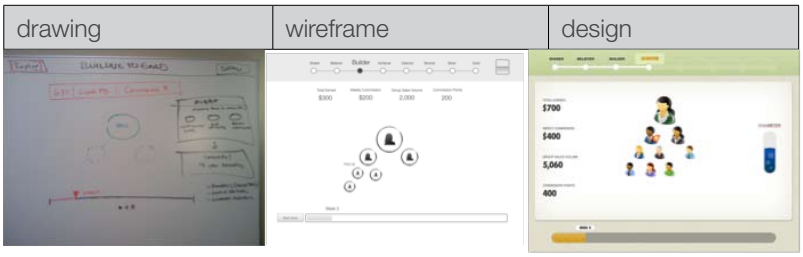


Wireframes

Wireframes are a visual guide that represents the framework of a website or application. Wireframes are usually created in low fidelity to facilitate the quick formation of different versions (also called iterations). Wireframes are a great way to quickly put an idea on paper. Some of the biggest ideas in the history of the web have started out as simple interface sketches on a restaurant napkin (Google started this way). Wireframes can fall anywhere on a spectrum of hi-fidelity to lo-fidelity. The advantage of wireframes is the ability to quickly mock up interfaces and more complicated interactions that would take a long time to create in code or in a graphic design program. They lack typographic style, color, and images in order to draw attention to the underlying functionality and content structure. Wireframes serve as the link between the information architecture and the visual design of the site. They are generally used by designers to create the final designs and will also help identify potential interaction issues. An effective wireframe should illustrate:

- The kinds of information displayed
- The range of functions available
- The relative priorities of the information and functions
- The rules for displaying certain kinds of information
- The effect of different scenarios on the display

The following shows the process of an initial wireframe concept on a white-board, then transferred to a digital copy, then to the final application design.



Prototypes

Protoypes are sometimes used instead of or in conjunction with wireframes, but their purposes differ. Both offer the ability to quickly mock up interfaces; however, prototypes are best at modeling and refining actual user interactions. Prototypes usually offer "clickability" or the ability for users to actually go through processes like sending a form or adding a product to a shopping cart. They also may be high or low fidelity, but they offer the ability to spot problems or inefficiencies in the processes. Prototypes are often used for A/B testing, which is also referred to as split testing, multivariate testing, or bucket testing. In A/B testing, the experience planner will distribute multiple versions of an interface or process to various test users. The users will be monitored to see which version accomplishes the desired task most efficiently.

It is important to note that to have meaningful results in an A/B test, there needs to be a large enough test group to identify true statistical significance. Just having a few users try out software will not do it. In recent years, the ability for small companies to accomplish this has risen due to a sharp growth in available tools, and the result has been a great improvement in online user interactions. Software such as Silverback and Google Website Optimizer makes it easy for a researcher to send prototypes to many people and record their time and even record screencasts of their session, making it easy to spot areas where the user might be confused or frustrated.

The process of content collection can also begin at this point. Once you have an idea of what the box looks like, it is easier to know what can fit in it. Content collection should really start as soon as possible, especially if content needs to be translated and localized for different languages and geographical audiences.

Storyboards and process flows

Storyboards and process flows help visualize user interactions. These tools offer the powerful ability to sum up hours of research in a few simple images. A client can quickly understand how the product will work and how it will be used.

A process flow is a series of wireframe screens showing what a website or application will look like to the user as they accomplish a task. For instance, you may be planning a multipage form and want to show how the screens will change as users go through the process in order to identify any superfluous or awkward interactions. You might draw a process flow using screens like this to illustrate (Neil, 2010):

Storyboards can also be used to illustrate the holistic view, showing how a user (shown as the persona) will interact with the application in context. Is the person using the website from a computer or mobile device? Do they live in the city or in a rural area? What kind of a computer or device are they most likely viewing it on? Understanding the larger picture can help in making decisions in the user experience.

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Terminology Review

- Information architecture—The structural design of information.
- Client interviews— An initial meeting with a client with the purpose of establishing project scope in order to begin requirements documentation.
- Creative brief—A questionnaire document used to establish qualitative data that will contribute to the overall aesthetic value of the site.
- Competitive analysis—An exploration of the companies in a given industry sector or market niche that are competing with your client's products or services for market share.
- Content inventory—A quantitative analysis of website content.
- Content audit—A qualitative analysis of the information found in a content inventory.
- Open card sort—In an open card sort, participants are asked to organize the cards into groups that make sense to them and then name each group.
- Closed card sort—In a closed card sort, participants are asked to sort

items into pre-defined categories.

- Site diagram—A visual site hierarchy in the format of an organizational chart.
- Storyboard—A series of visualizations showing the context of use for a website.
- Process flow—A series of wireframe screens showing what a website or application will look like to the user as they accomplish a task.
- Wireframe—A visual guide that represents the framework of a website or application.

Chapter V

THE DEVELOPMENT PROCESS

Nearly every organization maintains some sort of web presence. Even if they do not work for a web design company, it is common for communication professionals to oversee online development. Basic familiarity with the development process is important for anyone involved in communications, as inefficiencies in the web production process can cost a company time, money, and clients. Web design agency's development processes should be under constant scrutiny, changing and adapting to individual products, teams, and environments.

As a young creative director, I was tasked with creating a web development process for a small web software startup company. Small businesses would hire us to design their website, and then they would subscribe to our online content management system to maintain the site themselves. The initial requirements and design phases went smoothly, but many of our clients were just getting off the ground and had little or no content to put on the site. As busy small business owners, they lacked the time and resources to create the content themselves. Our clients would pay for the site, we would provide a design, but no progress would be made on the site after that for months because there was nothing to put in it. The clients knew this delay was their fault, but they were still unhappy that they didn't have a finished site. The problem was magnified when our marketing team decided to charge payment for half of the site up front and half at the launch of the site. We desperately needed to figure out a way to complete the websites quickly in order to collect the full invoice.

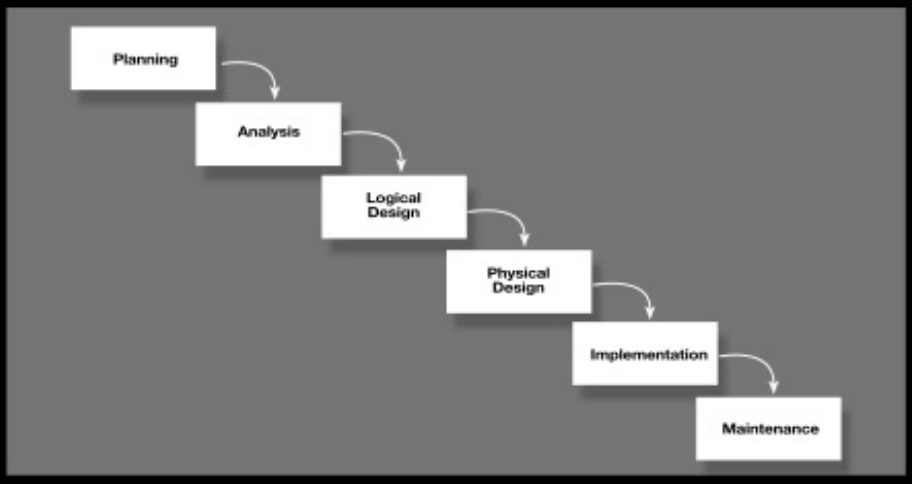
The solution to this problem was to add another step in our process: content collection and creation. After the requirements had been documented and the design had been approved, we would have a project manager work with the client to complete their content. If the client did not have all of the content they needed, we had content specialists (copywriters and graphic artists) create content for them. This solution had two effects: it made our clients happy because they got their websites done faster, and it made our company happy because we had another product to sell.

Waterfall, Agile, and Design-Chunking Approaches

While no two organizations' systems for developing websites are exactly the same, most organizations follow one of a few common processes. The most frequently used are the waterfall approach, the agile approach, and a newer agile-related concept called "design

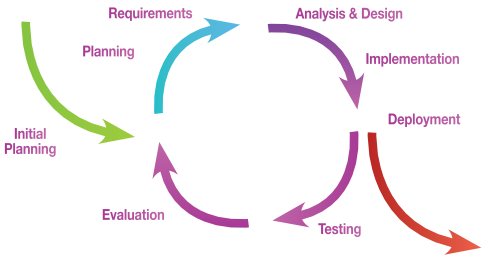
chunking."

The waterfall development model was initially used in the manufacturing and construction industries. Waterfall development was a good approach when the process required steps that could not easily be changed after they were produced (such as in building construction). When early software developers began looking for a structure for their projects, this hardware-oriented model was simply adapted for software development. While the waterfall approach was used frequently in the early days of software development, an agile approach is more common today.



The agile approach breaks tasks into small increments with minimal planning in order to provide a less rigid development process. Iterations are completed in short time frames that typically last from one to four weeks. Each iteration, or version, involves a team working through a full software-development cycle, including planning, requirements analysis, design, coding, unit testing, and acceptance testing when a working product is demonstrated to stakeholders. This minimizes overall risk and allows the project to adapt to changes quickly.

An iteration may not add enough functionality to warrant a market release, but the goal is to have an available release at the end of each iteration. Multiple iterations may be required to release a product or new set of features.



Team composition in an agile project is usually cross-functional and self-organizing, without consideration for any existing corporate hierarchy or the corporate roles of team members. The idea is to have team members with the best skills for the project. Team members normally take responsibility for tasks that deliver the functionality the iteration requires. They decide individually how to meet an iteration's requirements.

Agile methods emphasize face-to-face communication over written documents when the team is all in the same location. Most agile teams work in a "bullpen" (a single open office), which facilitates such communication. In order to simplify team communication and team collaboration, team size is typically small (5–9 people). When a team works in different locations, they maintain daily contact through videoconferencing, voice, e-mail, etc. Most agile teams have a formal, daily face-to-face communication routine among team members. In a brief session, team members report to each other what they did the previous day, what they intend to do today, and what their roadblocks are. This face-to-face communication exposes problems as they arise.

Agile development emphasizes working software as the primary measure of progress. This, combined with the preference for face-to-face communication, produces less written documentation than other methods. The agile method encourages stakeholders to prioritize wants with other iteration outcomes based exclusively on business value perceived at the beginning of the iteration.

Each agile team typically contains a customer representative. This person is appointed by stakeholders to act on their behalf and makes a personal commitment to being available for developers to answer mid-iteration questions. At the end of each iteration, stakeholders and the customer representative review progress and re-evaluate priorities in order to ensure return on investment and alignment with customer needs and company goals (agilemanifesto.

org, 2001).

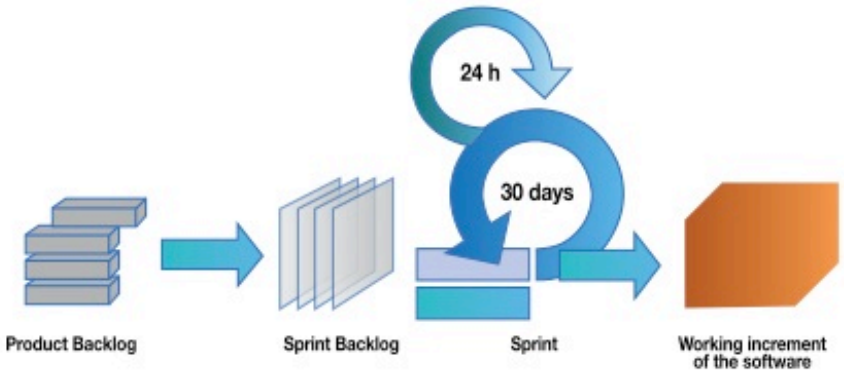
The "Manifesto for Agile Software Development" was written in February 2001. A group of software developers met at a resort in Snowbird, UT, to discuss lightweight development methods. They published the manifesto to define the approach now known as agile software development:

12 Principles Underlying the Agile Manifesto

- Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.
- Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
- Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.
- Business people and developers must work together daily throughout the project.
- Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.
- The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.
- Working software is the primary measure of progress.
- Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.
- Continuous attention to technical excellence and good design enhances agility.
- Simplicity—the art of maximizing the amount of work not done—is essential.
- The best architectures, requirements, and designs emerge from self-organizing teams.
- At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

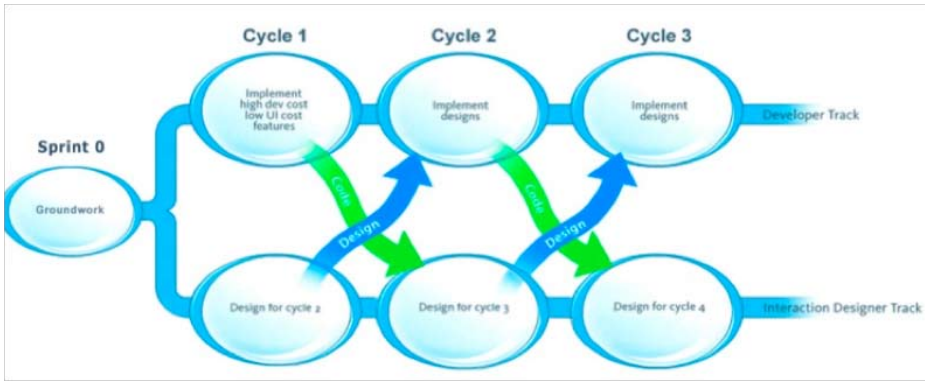
One approach to agile development is called "scrum." The term comes from rugby and describes a strategy in which a team circles in order to get the ball back in play. Scrum is an iterative, incremental framework for project manage-

ment often seen in agile software development. Although the scrum approach was originally suggested for managing product development projects, its use has focused on the management of software development projects, and it can be used to run software maintenance teams or as a general project/program management approach. Scrum projects make progress in a series of sprints, which are iterations no more than a month long. At the start of a sprint, team members commit to delivering features that were listed in the project's queue. At the end of the sprint, these features are coded, tested, and integrated into the evolving product. A sprint review is then conducted during which the team demonstrates the new functionality to the product owner and other interested stakeholders who provide feedback that could influence the next sprint.



Design-Chunking

Design-chunking is a newer approach that combines agile principles while maintaining consistent user experience and information architecture. This may seem like a contradiction, as information architecture is largely driven by a holistic approach, whereas agile development is more focused on small iterations and incremental development. In design chunking, the initial concepts are defined up front and then information architecture and user experience are broken apart into smaller pieces so that they can be delivered incrementally, in a scrum-type way. In this process, there is an initial sprint that takes place before development begins. Then, information architecture is removed from the development process (Mamoli, 2008).



Steps in the Web Design Process

Whether using the waterfall, agile, or design chunking approach, the standard web development process consists of seven major steps: define project requirements, conduct research and analysis, develop design, build, test, deploy, and maintain.

Define project requirements

Defining project requirements is a critical step in the web development process. The ability to correctly decipher the true scope and requirements of a website will make the process easy and successful or difficult and poorly delivered. Generally, when seeking to understand a client's vision for websites or applications there are three things that need to be understood: creative direction, scope, and feasibility.

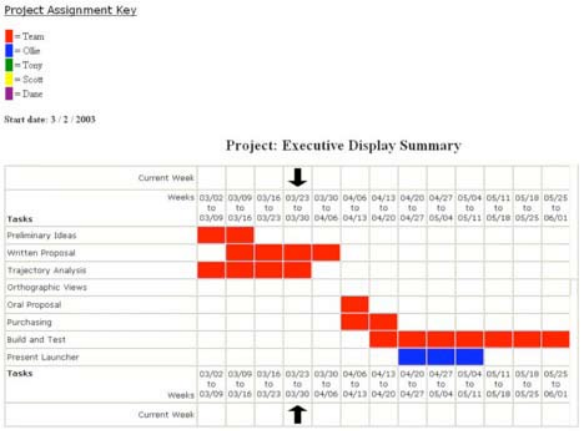
Creative direction can be understood through the help of a creative brief. Creative briefs are standard in the creative industry and help paint a picture of the end product that the client has in mind. Many clients know just what they want, but lack the terminology to communicate their vision to the creative staff. The creative brief remedies this by asking the right questions to reduce ambiguity. Some questions can be direct, such as "What color(s) would you like the site to be"? Some might be less direct, such as "If the site were a vehicle, what make or model of vehicle would it be?" Others could provide background information for the designers such as "What do you like or dislike about some of your competitor's websites?" The more questions a designer asks at this phase, the better he or she will understand her objectives. A good understanding of the client's desires from the outset will also save time-consuming revisions. Creative briefs can be used to gather more technical data as well, such as site architecture and special scripting requirements. Otherwise, that information can be collected during the scope phase.

Scope is also quite important to understand at this phase in the process. Scope can be best understood by discovering how many pages need to be built and what particular interactions need to take place on each page. At this phase it helps to gather input from someone who understands the development process. It is important to keep in mind that the client usually does not have any idea what the difference is between a small requirement and a large requirement. A web developer can bridge that gap and offer technical advice. The timeline should also be considered. A web marketer I once knew was fond of telling clients that our company could create anything they wanted as long as they had the time (and of course, money). The deliverable from this step should be some sort of "requirements" document outlining what needs to take place. This document should include things like rough project timelines, human and technological resources that will be needed to work on the

project, overall purpose, and a set of features that the website or application will possess.

The same marketer I previously mentioned used to say that a web project could be fast, cheap, or big. It could be two of the three, but never all three. Feasibility is discovering which of these is going to give. Every organization has to generate revenue in order to survive, and feasibility planning will help weigh where the priorities fall. I personally experienced this when a web design company I worked for discovered that it was losing money. Management was baffled because we were building more websites and adding more clients than ever before. It turned out that we were attempting to give our clients all of the three things: large, complicated websites done fast and cheap. We were doing a ton of business but were actually losing money on each of the projects that were completed. Our process was not economically feasible because we were paying massive amounts of money on overtime for employees (not to mention the amount we spend training new ones because many got burnt out and quit) and not charging enough from our clients to cover it.

At some point when determining feasibility, a project overview should be presented to the client and stakeholders. While an entire chapter, if not book, could be dedicated to the art of presenting the project to the client, it is particularly important to clearly communicate the project overview, timeline, and scope prior to project launch. The project overview should go over holistic goals, not the details that the client doesn't care about. It should include a timeline that identifies key deadlines, preferably presented in the format of Gantt chart that shows what different teams will be doing and when. Scope should also be included and simply define what the project includes and what it does not, especially if you are taking a phased approach.



Develop design

Once requirements have been established, the website should start to take form. At most interactive agencies, the task of translating the static requirements document into visual form is usually the task of a dedicated experience planner. At organizations with smaller staff, this job might fall to the project manager or the web designer. Experience planning is closely related to information architecture. The experience planner takes all of the information gathered by the information architect and uses it to design a vision of what the experience will look and feel like so that the production team and client can understand. It is the job of the experience planner to know what a user is going to do in order to accomplish the company's goals, such as creating an account or purchasing an item. The experience planner will identify key interactions, such as what kind of alert messages pop up when forms are filled out incorrectly and how images are enlarged when clicked on.

An understanding of users' habits is key to effective experience planning. These habits can be cultural. When I started work for my first international company, I prepared designs for a new video site. The design was sleek and modern, and in order to add contrast to the page and make the videos stand out, the background had been designed as very dark grey. As I showed the design to marketing managers from the different markets, all of them were very impressed. My ego was put in check when I presented the design to the representative from one of our southeastern Asian markets. She said bluntly," Our market will never use it." I was aghast, and asked why. She replied that the culture in her part of the world looked on dark web pages as ominous and preferred light, colorful pages, even for playing videos. I then went back to my office and spent some time previewing sites from that market. Sure enough, I found that pages typically had light backgrounds and colorful, animated text. I also found that the pages tended to have large amounts of content, a contrast to the clean, minimalist design preferred by some of our other locales. A new, different design was created for users in that market, and I learned important lesson about localization.

Experience planners spend as much time as possible learning as much as they can about their audience. As we discussed in chapter 3, it is typical for planners to create personas, or educated profiles of their typical users. Planners will identify user traits that correlate with results of demographic and

physiographic inquiry. For instance, say you were designing a website for a direct selling nutritional supplement company. After some research, you find that 70% of the company is made up of women over the age of 50 who are generally socially active and healthy. Other research has shown that users of this age and gender may not be as technologically savvy or spend a much time online as a group of Gen-Yers, and they might require a simple and feature-light interface to be successful.

Once all information has been gathered and the initial mockups have been approved, the final web design can begin. Web design is the process of taking the information that has been gathered and presented by the experience planner and creating the final designs. These designs are mocked up in a graphic editor, such as Adobe Photoshop or Fireworks, and then implemented using programming code. The web designer will transfer necessary layout design graphics over to formats that can be used in HTML such as .jpg, .gif or .png. The web designer is usually responsible for creating the Cascading Style Sheets (CSS) that will achieve the visual effects that have been proposed in the graphic mock-up; it is therefore important for the web designer to understand how style sheets work and be familiar with their advantages and constraints. The web designer needs to have an understanding of front-end technologies, such as JavaScript, to implement the user interactions that are required. The development team may handle some of the more complex interactions; however, it is typical for the web designer to implement moderately advanced JavaScript functions such as buttons that change when the user rolls over them or popup alerts when a problem has occurred. Complex JavaScript actions based on multiple variables may require the help of a programmatically advanced web developer.

Development

Web development is a somewhat broad term, but in the process I have illustrated, it means any of the non-design aspects of a website. This can include server-side coding, networking, security configuration, e-commerce development, and database configuration, anything that is written in code.

Test

Once the website is functioning, testing may begin. Platform testing is particularly important in the web development process. Different operating systems, such as Apple's OSX and Microsoft® Windows, will react differently to website content because they interpret the HTML code differently. To further complicate the issue, different browsers also can interpret web pages differently. Websites need to be tested across multiple browsers and operating systems in multiple scenarios to know if they look and act the same in all. The rapid expansion of the mobile browser market has added a new step to this, because mobile browsers and operating systems also act differently. Some browser-mimicking tools such as Adobe's BrowserLab allow testers to view the web page as it would look in multiple browsers in order to see differences.

Security testing is especially important in sites that receive and store sensitive information like payment or personal information. Open source developers have created some tools to help in the testing process, such as the Firebug and Web Application Security Testing plug-ins for the Mozilla Firefox browser.

Deploy

Delivery of the website usually consists of making the website "live" on the Internet and delivering the assets of the site (depending on the contract) to the client. Websites are usually developed on a secure server so that only those with permission can access the site in progress. When it is ready to go live, the domain name is pointed to the server holding the site and the security is disabled. This process can take up to 48 hours, depending on the capacity of the domain name server.

Maintain

Maintenance is not always the responsibility of the web development team, but it is important to keep it in mind. The web is a constantly changing environment and it is impossible for a website to exist statically. When new versions of HTML and other web languages are rolled out, code deprecation occurs, rendering code obsolete. Code deprecation occurs when certain code features are excluded from the library of code currently used. For instance, one

feature of HTML in the early days of the Internet was the “blink” tag, which allowed any given text to blink on the page. Use of this feature ran rampant, and the blink tag became so annoying to web surfers that the tag was disabled in most major browsers. It is important to make sure that your website is always compatible with the current version.

Sources

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Terminology Review

- Waterfall development—A rigid, non-iterative software development process.
- Agile development—an iterative approach to software development.
- Sprint—A short development iteration that contributes to the final product.
- Feasibility—An understanding of whether a project can realistically be completed given scope, timeline, and budget constraints.
- Browser compatibility—The extent to which a website looks and functions the same in different browsers.
- Code deprecation—When code is no longer included in the master code base and becomes unusable.

Chapter VI

PROTOTYPING

Prototypes are an effective way to test ideas, communicate concepts to clients, and assess usability. Prototypes are usually created once the requirements documentation and wireframes have been completed. A user experience designer will use these documents to create a functional prototype that can be interacted with. Unlike static wireframes, prototypes offer a way to interact with the concept in a real-life sequence of events. Doing so allows designers to spot potential issues before they become costly mistakes. In this way, prototyping reduces risk. By developing a prototype based on the requirements document, teams can also refine existing requirements, clarify the process, and eliminate problems before they are difficult to fix.

Software prototyping draws many of its methods from industrial design prototyping. Johnny Ive, a renowned industrial designer and the mind behind the design of many Apple computer products, said, "I love making prototypes. We go right from idea to prototypes. Prototypes create this dramatic shift in the conversation—suddenly it becomes tangible and the silence goes away" (Jary, 2009). Prototype design has the same effect when designing a website. Even in very detailed discussions, individual members of a team will have very different ideas of how something will work. When a product doesn't tangibly exist yet, it is natural for people to conform the idea to something they are familiar with. Creating a prototype puts a product in real-world context. Prototypes demonstrate the fundamental experience of using a product and eliminating the unknown.

The principal of Ockham's' razor says that simpler explanations are generally better than more complex ones. When creating a prototype and determining how a website or application will function, keep this as your mantra. As a general rule, the easiest user interactions are best. Beginning user experience designers are often tempted to design unnecessarily complicated interactions in misguided attempts to make a website fun and engaging. In the early days of the Internet, it was popular for websites to have a flash animation on the landing page that users had to click through to view the site. While these animations added personality, they eventually died off because they obstructed one of the user's primary goals, which was to get to the content on the website. Applied to web design, the Ockham's razor principle suggests that the path of least resistance is usually the best. If content can be displayed on a page without making it too content-heavy, don't put the content in a popup window that requires the user to click again.

Prototype Fidelity

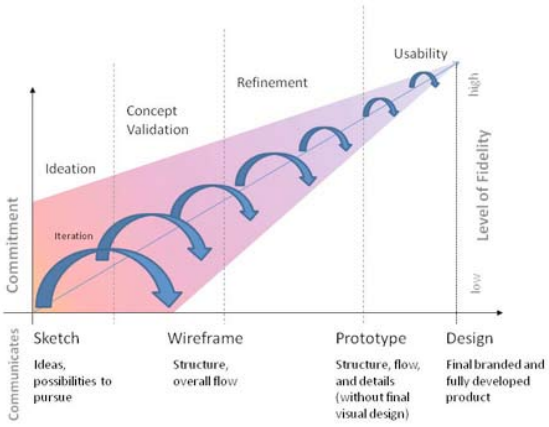
The first step to developing a prototype is determining fidelity. Fidelity describes the level of detail and functionality in a prototype. As a result of their placement in the design flow, prototypes will have a fidelity that falls somewhere between wireframe and final design. Within this range, there is a wide spectrum. On one hand, prototypes can be hand drawn on sticky notes and

shown interchangeably to illustrate a process. On the other hand, a prototype can be a designed, functional application that contains many of the final features. Each level of fidelity carries inherent benefits and risks. For instance, one common problem with presenting hi-fidelity prototypes is the tendency of clients to get hung up on minor design and functionality details and miss the opportunity to identify broader issues. Low fidelity prototypes, especially those not viewed in a browser or on a computer, make it easy to focus on interactions and not design. However, a low fidelity prototype may not be able to communicate advanced interactions like drag and drop or swipe.

Adobe has attempted to make creating prototypes in a wide range of fidelities easy with their Creative Suite software. Designers can design basic wireframes in Illustrator® or InDesign®, which can then be imported into Catalyst® and given some added design and functionality. The Catalyst® file becomes the working prototype and is eventually imported into Flex® where it is given the entire back-end programming requirements.

Throwaway prototypes

Throwaway prototypes fall at the low-fidelity end of the spectrum and are models that show only basic user interactions and are not used as part of the final product. These prototypes are simple, working simulations that can be created rapidly in computer programs like PowerPoint or drawn on paper then be discarded after testing. Throwaway prototypes can be very useful in the early stages of the development process because when changes are required, no reprogramming needs to occur. The prototype can be discarded and another one easily implemented. Throwaway prototyping is especially helpful in determin-



ing final requirements. It is common to initiate a web project with preliminary requirements in mind and use a prototype to think through the process and refine the requirements.

Evolutionary prototypes

Evolutionary prototypes are toward the high-fidelity end of the spectrum and are used as the foundation of the final product. They form the heart of the new product and can be used as features are being built and requirements are added.

One type of evolutionary prototype that is common to the web is Extreme prototyping, sometimes called HTML prototyping. It consists of three phases that build on the preceding phase. The prototype is initially constructed in basic HTML, but without any functioning web services (for instance, a form submission button would exist on the page but nothing would happen when clicked). In the second phase, dummy web services are implemented to show added functionality. In this case, when a form button is clicked the use might see a popup confirming the sent form, but no information is actually sent. In the third phase, the actual web services are implemented and the website or application becomes fully functional.

Prototyping Tools

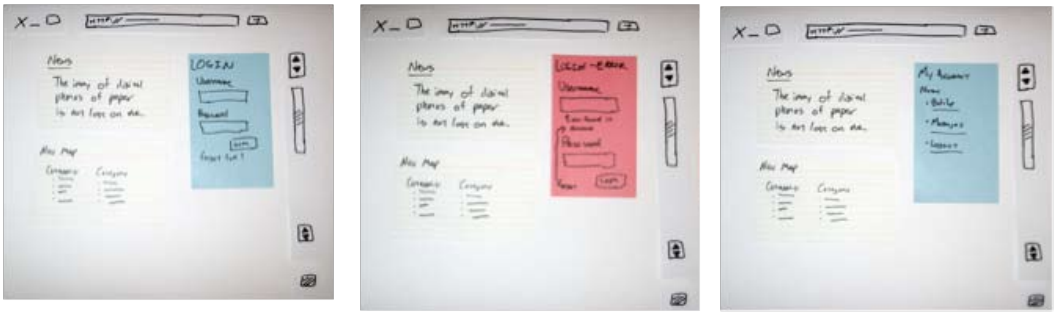
Paper

Paper prototyping is becoming common for prototyping in user-experience design, mostly due to the flexibility and disposability of paper and its ability to encourage experimentation and speedy iteration. It is the most basic form of throwaway prototyping, allowing designers to avoid wasting hours worth of layout code on ideas that don't work.

For teams on a shoestring budget, paper is a great low-cost alternative to many prototyping software packages. Even with a larger budget, some may still prefer paper prototyping because of its speed and ease of creation

using tools like Post-it® Notes or tabbed index card dividers. If it helps your team, you can print full-color objects to use in your prototype brainstorming sessions. It can be helpful to have a low-quality printer in the meeting room connected to someone's laptop for printing out new ideas. If you see a feature on a website that is close to one you would like to create, simply print out the web page and post it on the wall for everyone to see and make notes on. One of the biggest benefits of using paper is that you can write notes right on the prototype or on the back of each sheet or index card. This is a great way to capture ideas that might not make it into meeting notes.

Below is an example of illustrating a web interaction with a paper prototype. It shows a basic login form and what happens when someone logs in or fails to provide the correct information:



(Medero, 2007)

HTML

Another common way to design prototypes is by creating simple HTML documents. These evolutionary prototypes are created with code that can be used for the front-end of the final product. This method is most useful for front-end designers who are very comfortable with HTML and CSS and can create new iterations quickly. Advantages include being able to use the code in the final project and the ability to show the client how the website will function in the browser.

Software

There are a wide variety of software solutions for web prototyping, all with varying levels of fidelity, ease of use, and price. Many user experience experts use presentation tools like Microsoft PowerPoint or Apple's Keynote. These programs can be configured to jump to different screens when a user clicks and allow some basic screen design as well. In recent years, more advanced prototyping tools like Axure have arrived on the scene. These programs allow for advanced custom interactions that mimic actual web programming. They also come with stock components that look and work like web components, such as drop-down menus, forms, and drag-and-drop functions. Advanced programs like Axure are very feature heavy, can be somewhat complicated to learn, and can be relatively expensive. Somewhere between the complexity of Axure and the simplicity of PowerPoint there are also many new web-based prototyping services that reside completely on the web and require a minimal learning curve. Web-based prototypes are easy to send to clients for review; however, there is a slight drawback because they cannot be worked on offline.

Analysis

Once your prototype has been created, your team will want to spend time interacting with it and critiquing it. You may invite potential users to use it and gather feedback in a focus group. A focus group is a form of qualitative research in which a group of people are observed and asked about their perceptions, opinions, and attitudes towards a product. Focus groups are a valuable opportunity to gather usability information. The data you extract will help you refine your approach.

Types of analysis

Heuristic: Heuristic evaluation is a form of usability inspection in which usability specialists judge whether each element of a user interface follows a list of established usability heuristics, or procedures. Usually two to three expert

analysts evaluate the system with reference to established guidelines, noting their observations and often ranking them in order of severity. This type of analysis does not typically take place in the form of a focus group.

Subjective: Subjective assessment is more qualitative in nature and tells the evaluator how the users feel about the software being tested. This is distinct from how efficiently or effectively they perform with the software. For instance, while the time it takes to complete tasks on iOS and Android devices is comparable, iOS users are more likely to express affinity for their device. The usual method of assessment is to use a standardized opinion questionnaire to avoid criticisms of subjectivity.

Diagnostic Studies: General diagnostic studies help the evaluator identify significant usability problems. These studies are done with typical users, usually in the setting of a traditional focus group.

Conducting focus groups

When conducting a focus group, you will want to include the following:

- The product team who defines the goals and basic questions/topics for the focus group.
- The moderator who plans and conducts the focus group.
- The observers. Observers can be note takers or members of the product team who want to see the focus group firsthand.
- The technician who is responsible for setting up the recording and data collection equipment.
- The participants in the focus group.

Materials Needed

- Focus group sessions are generally videotaped, so you need a facility with video and audio equipment.
- The seating for a focus group should allow participants to see each other (a round table is useful) and also allow the easy recording of the entire group.
- Flip charts, adhesive notes, colored marking pens, and other materials for capturing the comments of participants and making those comments vis-

ible to the entire group.

- Audio recording can be a problem when you have people who are quiet or have heavy accents, so it is useful to have multiple microphones that can be adjusted to pick up voices from different locations in the room.
- If you are conducting an online focus group, you will need the appropriate software that allows the participants to chat and see the chats of others and also allows the focus group team to send questions to the moderator.

Steps for Conducting the Focus Group

1. Stakeholders work with the moderator on a discussion plan and decide on the criteria for recruiting participants.
2. The client and moderator prepare a screening questionnaire and draft a discussion guide for the focus group.
3. Develop a data analysis plan.
4. Recruit participants. If possible, provide incentives. Some participants may not be able to accept incentives (government officials and participants from regulated industries, such as insurance and banking, may not be allowed to accept any incentives).
5. Conduct a pilot test of the moderator's guide with a small group. Modify the guide based on the results of the pilot test.
6. Check out the facility where the focus group will be held to ensure that the audio and video is set up properly (some of us have been embarrassed by blank videos because we were working in a remote site and forgot to flip a switch!).
7. Describe the topic and rules for the focus group. Be clear on the rules, as this may help if the discussion strays or someone tries to dominate the group.
8. Begin the focus group with a good general question that everyone can answer and that the group will find involving. The first question must be one that gets everyone to talk.
9. Follow the discussion guide and try to cover all the topics/questions that are important to the client.
10. At the end of the session, summarize the key points that emerged, ask if there are any final comments, and thank the participants.

11. After the focus group, collect any forms, make sure the forms are coded properly, and spend some time debriefing the focus group team.

Common Focus Group Issues

- Focus group moderation is difficult because remaining neutral and not influencing answers is harder than one might think. An experienced moderator is important for a successful focus group.
- The results of a focus group depend on the interaction between the participants and the moderator, and poor moderating can lead to distorted data and misleading conclusions.
- A single dominant participant can cripple the focus group by intimidating the other participants into agreement. The moderator must work hard to prevent dominant personalities from monopolizing the discussion.
- The participants for a focus group should be reasonably homogenous because the discussion of opinions and attitudes is facilitated when the participants share some type of common bond. If the people are too diverse, you may end up with few common threads.
- It is often useful to overbook a focus group by about 20%, as some people may just decide not to show up, get caught with late meetings, or end up stuck in traffic.
- While refreshments are often a minor incentive and are important for making the participants feel comfortable, consider keeping the food outside the focus group room so the focus stays on the topic rather than the food.

(usabilitynet.org, 2006)

Post analysis

Immediately after a focus group session, the moderator should walk through the results and review the trends, questions, and comments for each section of the study. The moderator should also conduct a quick review of the notes and any participant response forms soon after a session to identify any moderator or participant errors. Videotapes can be consulted if the notes are unclear, and questionnaires can be reviewed for obvious inconsistencies.

All data from the focus group should be coded and recorded. Data from a usability focus group will generally fall into either qualitative or quantitative

categories. Quantitative codes from closed questions or exercise data (for instance, the amount of time it takes each user to complete a process) can be tabulated into summary tables showing frequencies, percentages, and other descriptive statistics. Qualitative data come from open-ended questions and the dialogue between moderator and participants. Setting up codes and categories for open-ended and verbal data begins with the transcription of all the open-ended and verbal data (Usability Body of Knowlege, 2011). As data are transcribed, the analysis team (often the moderator) will categorize responses into trends, issues, and topics. Some common categories in Human Computer Interaction include (Kuniavsky, 2003)

- Mental models
- Metaphors
- Likes and dislikes
- Stories and quotations
- Problems and issues
- Differences between competitive products
- Differences between different groups or subgroups

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Terminology Review

- Waterfall development—A rigid, non-iterative software development process.
- Agile development—an iterative approach to software development.
- Sprint—A short development iteration that contributes to the final product.
- Feasibility—An understanding of whether a project can realistically be completed given scope, timeline, and budget constraints.
- Browser compatibility—The extent to which a website looks and func-

tions the same in different browsers.

- Code deprecation—When code is no longer included in the master code base and becomes unusable.

Chapter VII

TOOLS

There are a few tools and resources necessary for producing a website: a web host, a way to transfer files, and a code editor to edit the documents. Free versions of these items are available for beginners, and more advanced, feature-rich software packages are available for nearly any price.

Website Hosting

As we discussed in our chapter on Internet Fundamentals, websites are made available to the Internet via web servers. A web server technically can be any computer with an Internet connection and the proper configuration. Some people use their own personal computers as web servers; although, this method can be difficult because of the time and effort involved in technical maintenance. A more common and practical solution is to rent server space from a web host. A web host is a company that has a large datacenter with hundreds or thousands of web servers, an ultra-fast Internet connection, and a professional staff to maintain the servers. Web hosting is a huge market and there are thousands of companies and resellers of hosting services worldwide.

Web hosts

For small, personal websites that probably won't get a lot of traffic, free web hosting services may be available and can be a good choice. Most free web hosts will provide between 10 to 100 MB storage and a monthly data transfer (also known as bandwidth) of about 1 GB, which would accommodate a small site of around 15 pages with images. Some free web hosts recoup money by placing advertisements on the websites; although, a growing number allow limited space and traffic free of advertisements in the hope that the site will expand and require one of their paid packages.

For a normal site with average traffic and storage needs, the price is reasonable. Full-featured professional hosting services can be found for between $6 and $15 per month. The price differences depend not only on the amount of disk space and monthly data transfer (bandwidth) offered by the web host, but also on certain additional hosting features and the availability of technical support.

Space and bandwidth

Storage space on a web server refers to how many web pages, images, media files, and other data (access logs, contact lists, product databases, backups) will be stored on the hosting account. Web pages alone will prob-

ably take up the least amount of space. With an average file size of about 15 KB, well over 3,000 web pages could be stored at a 50 MB server space. Much more space is taken up by images, databases, and downloadable files such as audio, video. or large PDF files.

The term “data transfer” refers to how many visitors visit a website and how much they download. Every time someone visits a web page, the web page itself and everything contained in it are downloaded to the visitor´s browser. Assuming the average web page has a file size of 15 KB and all the images (logo, buttons, banners) have a total size of 25 KB, each new visit would equate to a total of 40 KB of bandwidth usage. So with as little as 1 GB bandwidth, a website could get more than 250,000 visitors every month. Most web hosts provide at least 1 GB of server space and 30 GB of bandwidth for a monthly price of $10–15 a month.

Web hosting features

It is important to know which features to look for in a web host, even if they are unfamiliar. For instance, to install the WordPress Content Management System (CMS), a server that can run the latest version of PHP is necessary. The following list is a basic list of features needed to host a medium sized site with an average amount of traffic:

- Linux Apache web servers
- At least 500 MB disk storage
- At least 10 GB bandwidth
- Several POP3 e-mail accounts
- Multiple e-mail aliases
- E-mail forwarding
- E-mail autoresponders
- Webmail
- At least 10 Subdomains
- At least. 1 MySQL database
- FTP access (for file uploads)
- SSI (Server Side Includes)
- .htaccess support to override basic server configuration
- PHP support

- Secure Shell access (SSH)
- Website statistics
- Shopping cart
- SSL Secure Server

Many web hosts also offer access to different general applications that can be added to websites, such as bulletin boards, chats, web auctions, polls and surveys, help desks, and blogging software.

Shared hosting vs. dedicated servers

Most medium-priced hosting plans operate on a shared server, meaning a website will share the space and data transfer rate of one server with dozens or hundreds of other websites. This means that the responsiveness of the site can be affected by changes to the traffic to the server as a whole. For instance, if a site were hosted on the same server as other sites that get a lot of Black Friday traffic, the speed on that site will be affected. A dedicated host, on the other hand, is a single box dedicated to one site and handles its own load.

Even though most people do not use a dedicated server, it is important that any web hosting service has good scalability. Scalability means that in the event of a sudden increase in traffic they would be able to quickly move the affected website to a server with more available bandwidth to accommodate the traffic. This flexibility is what keeps a site from crashing if it unexpectedly experiences a dramatic increase in traffic.

Working with Files on a Server via FTP

After selecting a web host, the next step is to find a way to transfer files from a personal computer to the site's shiny new server space. Even if a website has been created with the help of a CMS, there will be occasions when files on the server will need to be accessed directly. FTP (File Transfer Protocol) is a simple, common way for non-programmers to exchange files over the Internet.

In fact, most people are unaware that they use FTP every time they download a file from the Internet. Accessing a server through FTP is similar to HTTP because it is accessed at an address.

FTP uses the prefix ftp:// instead of http://. Everything after that remains the same.

Standard website address: http://www.suu.edu
Corresponding FTP site address: ftp://ftp.suu.edu

Most often, a computer or server with an FTP address is dedicated to receive an FTP connection. Just as a server that is setup to host web pages is referred to as a "web server" or "website," a server dedicated to receiving an FTP connection is referred to as an "FTP server" or "FTP site."

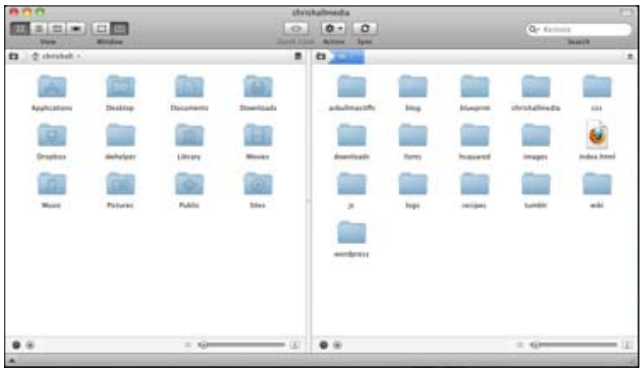
FTP security

Obviously, it is important that connections made over FTP are secure. Consider the possibilities: By gaining access to the files kept on a web server, hackers can change HTML files to show damaging or embarrassing content or make users vulnerable to cyber attacks. Hackers can gain access to user information stored in databases and many other kinds of secure information and use it maliciously. For this reason, there are several methods of transferring files securely over FTP. They include FTPS, SFTP, and FTP over SSH. Each offers slightly different ways of transferring files with different benefits. Generally, they all require some kind of username and password to get access. Some files are made available anonymously and do not require login, such as software updates that are downloaded from a support site.

FTP clients

While it is possible to make an FTP connection using a standard web browser (Mozilla Firefox, Internet Explorer, Google Chrome, etc.), most people prefer to transfer files with the help of a dedicated FTP software program, referred to as an "FTP client." When using a web browser for an FTP connection, FTP uploads are difficult and downloads are not protected (one of the reasons it is not recommended for uploading or downloading large files). FTP clients are

generally simple to use, can use secure transfer methods, and have additional features like upload queues and drag and drop functionality. Most FTP client interfaces incorporate a simple two-pane design. The pane on the left displays the files on your computer and the pane on the right displays the files on the remote computer. File transfers are as easy as dragging and dropping files from one pane to the other or by highlighting a file and clicking one of the direction arrows located between the panes.



Directory Structure

Think of the web server space in a hosting account like a large filing cabinet. One of the most important aspects of web development is creating a well-organized file directory structure to contain the various files needed. There is no standard way to organize a website's file structure. In fact, it doesn't have to be organized or have any folders at all (though not recommended).. There's no explicit rule in HTML, CSS, or JavaScript that requires files to be organized. The problem with that should be obvious. If files are unorganized, it will become harder and harder to update and maintain a website.

Most websites will contain files that will fall into at least three categories that should each have distinct files:

- Images
- Styles
- Scripts

When naming the folder, choose something that easily communicates its contents. Some web designers name their styles folder "CSS" and their scripts

folder “JS.” There are likely other names, but usually these are the most common. More advanced websites that take advantage of server-sided scripts will usually have other folders such as a folder for data, a folder for code, as well as unique folders that handle specific functions, such as web services or classes.

The initial structure would look something like this:

```
/ Root (the parent folder where all files are placed)
    / Images
        Logo.png
        Banner.png
    / Styles
        Main.css
    / Scripts
        Script.js
    Index.html
```

Some tech companies have a pre-set file structure in place or a specific template structure that will need to be used when creating a website from scratch. Having a consistent structure is very helpful for updating and maintaining more than one website, as well as turning over a website to another team. For sites that require users to have different levels of permissions for access, it is helpful to create folders that address needs. Organizing a website in this manner helps with what is often called “membership and roles.” With membership and roles, account holders can have rights assigned to them to allow or disallow them to see certain content.

Having a clearly defined folder structure will be very helpful developers because they can keep things much more organized and find things much more quickly. It will make development easier, because the files users access can be defined by the content of a folder rather than a list of paths to different files that could reside anywhere. Thinking early on about the file structure will help to avoid costly mistakes later, like needing to change referenced paths throughout a website because a folder should have been added to the structure.

The root

One of the most important concepts in setting up a website is to understand a website's root. When publishing a website (sometimes called "going live" or "deploying") the root becomes the base domain, for example http://www.suu.edu. On the development computer (referred to as "local") this root is the topmost parent folder of the website.

If, for example, the developer put all of the files for a website in the directory C:\Users\Administrator\Projects\mysite\, that directory's path is the root of the website. When the site goes live, the directory path will be replaced by the base domain (http://www.mysite.com). "Index.html" is the file opened at the root. In other words, if a user typed in "www.myfirstwebsite.com," the browser would look for index.html and open it first. If there isn't such a file, the browser will attempt to open up the directory file tree. For basic sites, there must always be a file called index.html located in the root.

Setting Up a Domain Name

Domain name configuration

The domain name is the address a user enters to access a website. Before we review how to configure a domain name, it is important to be aware of how a domain name works. There are three parts to setting up a domain name for a website: (i) registering the domain name with a domain registrar, (ii) setting up the domain name entry in a Domain Name System (DNS) server, and (iii) configuring the web server to "listen" to the requests for the domain name. A request for the domain (e.g., http://chrishallmedia.com) starts at one of the registrar's servers, which then routes it to a DNS server containing the DNS information for the domain. Once the DNS record for the domain resolves the domain name to a particular IP address, the request is sent to the web server listening to that IP address.

Registering A Domain Namet

Most web hosting companies will offer domain name registration as part of their package. While it is convenient to use the same company to host a website and register the domain name, it is not necessary and merely requires some additional legwork to redirect the domain. A domain name needs to be registered with one of the Internet Corporation for Assigned Names and Numbers (ICANN) approved domain registrars for a yearly registration fee. One of the cheapest and most popular registrars is GoDaddy.com (http://www.godaddy.com). There are also registrars for country-specific domain names (such as .co.uk for United Kingdom, .nl for Netherlands).

ICANN will ask for the following information:

1. Domain name owner credentials (name, company name, address, phone, e-mail address, etc.)
2. Administrative contact credentials
3. Technical contact credentials
4. Domain Name System (DNS) server details

The DNS server (also known as name server) is usually provided by the web hosting company. The DNS server should have entries of the domain name as explained in the next section. At least a primary (e.g., ns1.chrishallmedia.com) and a secondary (e.g., ns2. chrishallmedia.com) name server address are required.

Domain setup

The domain setup on the DNS server can be done after the domain is registered; however, the domain name will not work until the DNS setup is completed. The setup is complete when a DNS server maps the domain name to the IP address(es) of the web server and mail server so that a user can connect to the webserver or mail server using the domain name and not the IP address.

At this point a “forward lookup zone” is created for the domain name on the DNS server. Start of Authority (SOA), Name Server (NS), Hostname (A), Alias or Canonical Names (CNAME), and Mail Exchanger (MX) entries are added to

the forward lookup zone as shown below for a domain “foodomain.com” with name servers “ns1.dnsserver.com” and “ns1.dnsserver.com”.

Start Of Authority (SOA) record:

The SOA record is very important because it denotes the official DNS record for the domain name. There can be only one SOA record for each domain in a zone file.

Address (A) record entry:

The address (A) record is added to the forward lookup zone of the domain and it is associated with the IP addresses of the web server, which will handle the requests for the domain. There can be multiple A records, in which case, it will use the round robin DNS load balancing mechanism to assign the requests.

Alias (CNAME) entry:

A canonical name (CNAME) record maps an alias to the real name. Note that an alias for www is setup as a CNAME, so that requests to www.domain.com is sent to the same website that handles the requests for domain.com.

Name Server (NS) record:

The NS record is used to define the name servers for the domain. It may seem redundant to keep a record of the name server in the DNS entry since the name server lookup is already present in the registrar records, where the lookup for the domain starts. However, since it is possible to use more than one set of name servers for domains and subdomains, this record can help find the name servers for each one. The NS records are then mapped to CNAME entries.

Mail Exchanger (MX) setup:

The mail exchanger domain configuration is required if an e-mail server is set up to handle the domain mail accounts. For example, an e-mail address like chris@chrishallmedia.com will require a domain setup for handling emails sent

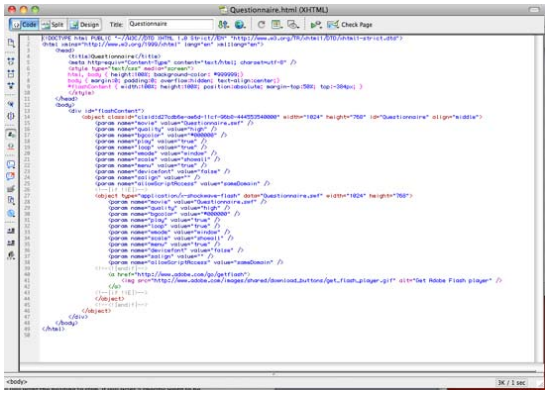
to chrishallmedia.com. The setup is similar to the CNAME setup but with MX records. There can be multiple MX records (e.g., for backup mail servers).

Configuring web server for domain

Once the DNS server is set up to send the request for the domain to the corresponding IP address, the work of the web server begins. The web server needs to be configured appropriately to handle the request for the domain based on either the IP address or the host header entry. Host headers are commonly used by web servers to host multiple domains on one IP address. For instance, the domains chrishallmedia.com and chrishall.com could both point to the same IP address, taking visitors to the same site.

Editing Files

HTML, CSS, and JavaScript files don't require any specific software to edit. These files can all be edited with a simple text editor. Default text editors ship with most operating systems, and on a Windows computer you can use Rich Text Editor and on a Mac you can use textedit. Professional web designers generally prefer more advanced software packages that contain more features, such as the current industry standard web development package, Adobe Dreamweaver. Dreamweaver's main appeal is that it is designed around a designer's perspective rather than a programmer's, yet it still has powerful tools for programming. It also works seamlessly with Photoshop, Illustrator, and Flash. There are alternatives to Dreamweaver, however, that do a fairly good job. Expression Web is Microsoft's direct answer to Dreamweaver. It too integrates with Photoshop and



Illustrator. But, instead of Adobe Flash. it uses Microsoft's Silverlight for animations.

Website editing tools with advanced features offer several benefits. One is color coding. Many code editors will color different tags differently in order to more easily locate the block of code later. Advanced editing tools also can number lines and have marking mechanisms for locating or bookmarking important lines of code. This can become very important with large files, as some code documents can run into the tens of thousands of lines. Another feature common to coding software is the ability to autocomplete certain code phrases. This is extremely helpful for beginning coders who may not be familiar with every available syntax available in a code language. When part of a word is entered into the editor, a list of close suggestions appears. Some advanced editors also have FTP technology built in, so files can be uploaded straight from the editor, and some include testing services, making it possible to see how code renders in the browser before it is uploaded to the server.

Best practices

Often used in software design, the term "best practice" denotes a developer's desire to create clean, readable, and maintainable code that complies with generally held standards. The idea of using best practices basically means that a developer is adhering to the generally expected way of doing things. A best practice is a method or technique that has consistently shown results superior to those achieved with other means and that is used as a benchmark.

Best practices come from three general sources: industry standards, company standards, and personal standards. Sometimes all three agree completely. Other times they don't. Some standards are recommendations from standards committees such as W3C, which is a trusted source for sound advice on industry-based best practices.

Terminology Review

- FTP—File Transfer Protocol, the protocol used for transferring files over the Internet.
- SFTP—Secure FTP, uses SSH to transfer encrypted files.

- FTP client—Software used to transfer files between a personal development computer and a web server.
- Code editor—Software used to edit code documents, such as HTML, CSS, and JavaScript.
- Best practices—A best practice is a method or technique that has consistently shown results superior to those achieved with other means and that is used as a benchmark.

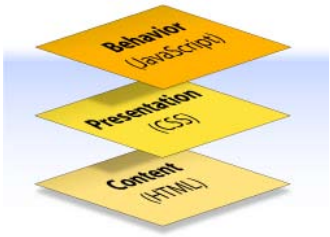
Chapter VIII

CONTENT MANAGEMENT

From a technical perspective, the components that make up a web page can be separated into three layers that define to the way it appears and how we interact with it: content, presentation, and behavior. We've already covered some content strategies in our chapters on Writing for the Web and Information Architecture; this chapter will focus on working with content though web content management software.

Layers of Web Design

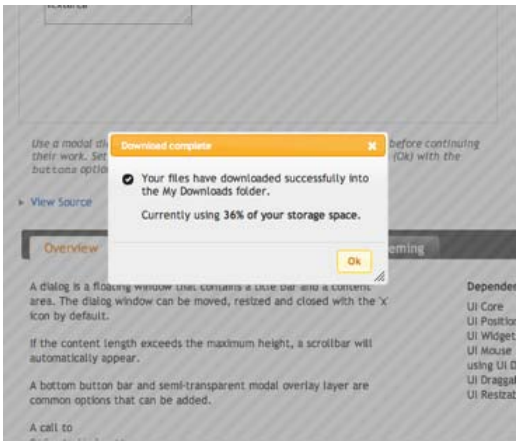
Content layer



Content is the basic information contained within the page. It is embedded within HTML or XHTML markup that defines its structure and semantics. Text makes up the vast majority of web content, but images, animations, sound, and video are all considered content. Consider the whitehouse.gov website. Content on this page includes the body text, headlines and words used for navigation. We could also consider the photo in the banner content. Web design layers also overlap in some areas. For instance, the hyperlinks would be considered content, but since they also exhibit the functionality of taking the user to another page they can be included in the behavior layer. In the example below, the content is the text shown in the popup.

Presentation layer

The presentation layer defines how the content will appear to a user. The presentation layer is growing more complex all the time due to the myriad ways people access the Internet. The presentation layer can be different based on device size, shape, and operating system, and even browser. Presentation also applies to non-visual elements such as accessibility for the visually impaired. There is some overlap between the presentation layer and content layer, because some tags in HTML can be used to affect the appearance of text. For instance, it is possible to create red title text by specifying font color and size in the HTML of the content layer. The best way to control the



presentation layer is through Cascading Style Sheets (CSS). In the example to the left, the presentation layer is comprised of the visual elements such as the shape and color of the popup box and the size and color of the font.

Behavior layer

The behavior layer denotes real-time user interaction with the document. Behavior is produced by everything from basic HTML interactions, such as clicking on hyperlinks, to complex back-end database schemas and web services. The behavior layer encompasses how the web page responds to and interacts with the user. The popup example above shows a simple JavaScript alert that displays information and requires user acceptance in order to proceed. The programming that enables the popup requires client-side scripting technology like JavaScript or ActionScript.

The Evolution of Web Content Management

Web Content Management System (CMS) software makes it easy for web designers and editors to contribute to a website without having extensive knowledge of code. In the early days of the Internet, web developers usually coded websites line-by-line from scratch. As technology advanced, WYSIWYG (What You See Is What You Get) web editors emerged, allowing non-coders to use simple graphical interfaces to drag and drop elements, such as images and text, to design their layouts. These early editors generally lacked sophistication and still relied heavily on coding for their web pages to function properly. One such popular site was Yahoo's Geocities.com, a service that allowed users to create and host their own web pages for free and to edit the HTML in a code editor. MySpace.com offered page owners the ability to modify the look of their "space" with an HTML editor, which spawned a host of 3rd party applications that would create MySpace code with the help of more graphical interfaces. While these early editors offered little in the way of real website administration, they were the foundation of the robust systems

we use today.

When blogging and online syndicated content began gaining traction in the early 2000's, CMSs graduated from being perceived as novelties to journalism tools. There was a growing need for people to be able to easily write and manage blog posts, while still being able to customize the look of their site. Websites like BlogSpot.com offered minimal aesthetic modification tools but made syndicated content publishing a breeze. Blogging increased in popularity and a generation of new CMSs sprang up to accommodate the demand. One of the more popular was WordPress, a still widely used platform that we will discuss later. As the blogosphere reached maturity, users grew accustomed to having blogs on their websites and began to demand more aesthetic flexibility.

It is important to note that during this time a new breed of web designers with different skills than previous generations were beginning to emerge. Sometimes called "Front-end designers," these individuals had more technical knowledge than graphic designers of the past and, thus, were able to use code to achieve more intuitive and aesthetically pleasing interfaces. Historically, the web design process had generally consisted of graphic designers, most of whom were more familiar with print design, and back-end (code) web programmers who did not have any experience with designing the front end (what the user sees on the page). These new front-end designers had the coding knowledge to integrate their designs with the back-end, and they also had the design experience to make it look good. They demanded better design tools from their platforms, and as a result, many CMSs evolved into more sophisticated platforms capable of advanced interface manipulation.

Content Management Systems have become nearly ubiquitous in web design, even for small business websites with only one or two editors. They allow developers a consistent framework to build on. They provide designers the tools they need to modify the interface. And they allow webmasters the ability to manage content with whatever level of scrutiny is needed.

Advantages of Content Management Systems

Templates

Content Management Systems generally use some sort of templating system that allows designers to make layout changes in one place that will affect all pages using the same template. For example, if a designer needs to change a link in a website's navigation, by using a navigation template, he or she could change the link in the template once, rather than having to reiterate the change on each individual page that contained the navigation. One of the underlying technologies that make this possible is Cascading Style Sheets (CSS), which can be imported into a group of HTML documents but modified from one central document. One style sheet can control the look of countless pages, making layout changes easy.

Roles and permissions

Often there will be different groups of contributors and editors making changes to a website who will need different levels of access. Good CMSs will support this. For instance, if you were the webmaster of a local newspaper website, you would likely have a team of writers who need to add content to the website daily but who do not have much technical knowledge. You obviously don't want them inadvertently changing the web pages as they add content. As the administrator of your CMS, you can assign them to a permission group that has minimal access to the website interface code, but unlimited access to adding new content. The "administrator" level of permission would be allow the webmaster to add new content and make changes to the layout of the site; however, the writers with less permissions will not able to see any of the functionality that controls layout, only the functionality that allows them to write and edit news stories. To add further control, many systems allow the administrator to see which writer or editor made which changes to the site. This is also a function of versioning, which we'll talk about later in the chapter.

Intuitive for the non-tech savvy

Because non-web designers are common users of CMSs, the interfaces are usually fairly easy to understand and navigate, most using some type of WYSIWYG editor. All of the major functions of the CMS can be accessed through the graphical interface; however, most still provide a code editor for making direct changes to the code of a website and editing templates for those who have more technical knowledge.

Workflow

When working on a website that has multiple editors and content creators, CMSs make it easy to manage the flow of changes that appear to the public. CMS software is particularly good at creating task cycles that can be managed by an administrator. For instance, an online news website CMS could be configured to allow many reporters to create and submit stories for the website, but they would not be published to the live site until they had been approved by the editor.

Syndication

Most CMSs offer some way for readers to subscribe to updates in the website content. Content syndication is usually done through an RSS (Really Simple Syndication) or Atom feed. These feeds are simple XML (Extensible Markup Language) documents that contain basic information about the website content being subscribed to, such as an article's title, description, and URL. The CMS handles the task of automatically updating the XML document every time new content is published. Many CMSs also have built-in e-mail database features that allow site visitors to get automatic updates when changes are made to the site.

Versioning

Versioning capabilities are common in web development, and many CMS solutions come with some sort of built-in versioning feature to make the process easy for non-programmers. Versioning refers to the ability to "roll back" changes made to the website. In a versioning system, changes to the code

of a website are "committed" when they are ready to be made live. The versioning system keeps track of each commit, and users are able to go back and revert to previous versions if needed. For instance, if company XYZ had a disgruntled employee who decided, before leaving, to place an embarrassing photo of the company's CEO on the main page of the company website, the administrator could simply roll the website back to the version before the embarrassing photo was uploaded.

Open source collaboration and communities

While some systems are available for a one-time fee or through a subscription, many CMS solutions are open source. Open source software is updated and maintained largely by a collaborative development community, and the system is available for free. One of the advantages to open source software is that the direction of an application (the features and upgrades) is decided largely by the community of developers who use it. For instance, consider a CMS that allows the use of plugins for functionality. Developers who identify a particular need for a specific type of plugin, such as an image rotator or e-mail form will write the code for the feature themselves and then make the plugin available to the public. As the developer community grows, more plugins become available options for functionality expand.

Support for multiple websites

Many companies have multiple websites to support their online marketing strategies. For instance, some may have a B2B (business-to-business) site in addition to a B2C (business-to-consumer) site, with each site having different goals and content. CMS software that allows administrators to manage multiple websites in one place makes the process of managing content for both sites much easier. For instance, an electronics store may sell the same products to businesses as well as consumers and have different sites for both. In a CMS that allows for multiple sites, the website administrator might only have to upload the image of a new product once and be able to use the product information on both sites, rather than having to upload multiple times.

Localization

Similar to managing multiple websites, many companies have multi-national audiences and need to have different versions of the same site that appear depending on the user's geographical location. The ability to manage this is quite important, given that different countries may have different legal requirements for selling items online, what type of language can be used to sell products, etc. Translations for the website copy will also need to be uploaded easily into the various languages that the markets require. CMS software that allows for multi-market localization makes it easy to maintain the same look and feel and basic content structure while allowing for changes to language and images.

Choosing a CMS

As previously mentioned, there is a good chance that, at some point, a communications professional will be in a position to help select or create a web CMS. This is not a task to be taken lightly; the strength of a company's web presence can rest on how effectively their CMS functions. Whether as a writer, a graphic artist, a web designer or an Internet marketer, any communications professional who works with online content will probably be spending quite a bit of time in the system. It is important to consider the following factors when choosing a CMS:

Community

While it is not a good idea to choose a CMS based solely on the size of the user base, it is important to consider what the size implies. Generally, CMS solutions with large user groups are popular because they have most of the features that a broad range of companies are looking for. Small, specialized shops or large companies with a multitude of web technology needs might require more specialized solutions. However, if the pre-existing software seems to be working for most people, it is probably a good choice. If the software is open-source, a large user base might mean that there is also a large developer community actively working on enhancements to the software. This is

an important consideration if it's necessary that a website be able to offer the functionality of new technologies as they emerge.

Documentation

A CMS without proper documentation is essentially useless. Select a CMS that offers documentation beyond a simple reference document and includes community discussion boards with active moderators contributing to the discussion and some kind of searchable database or online wiki.

License

Be aware of the CMS' license restrictions and that make sure the software is being used legally. Some open source solutions still require that some kind of recognition is given about the CMS when used on a website. Also, some CMSs have restrictions on the number of websites or markets that the CMS can be used for. Being aware of the CMS licensing restrictions can save a company time and money down the road by avoiding legal issues and the cost of changing CMS software.

Bridging the gap

Content Management Systems can sometimes cause friction between departments in a company. Most companies have separate IT and marketing / creative departments. The IT department will have very different needs than the creative and content managers. Generally, the IT department will want software that plays nicely with its backend and development team (for instance, a team of Java developers might not want a solution built in a coding language that their servers do not support). The content manager, who is usually part of the marketing or creative team, is going to want intuitive software that makes whatever he or she does easy.

Page creation can be difficult. Usually, pages that can be used in the CMS as templates have to be written in code by developers. So, if a designer is not sure how the template code works, the process can be frustrating for both sides. When considering template creation it is important to have someone working on the project who understands both design and development and who has an intimate knowledge of how the CMS templating system works. Such a person might be hard to find, but it is worth the search because it will save you many headaches in the future.

Purpose

The goals of a project can dictate what kind of CMS is needed. CMS software tends to be focused in one of two areas: content syndication or website design. Online systems such as Blogger and Tumblr make it very easy to add blog posts, but offer little in the way of website customization. Systems like WordPress and Moveable Type have evolved from basic blogging software into feature-rich website builders that have many of the full CMS functionality we've been talking about.

Resources

CMSmatrix.org is a free online tool that allows users to compare hundreds of CMSs side by side by selecting feature requirements. Use this for doing a quick filter of which systems have the desired features to begin narrowing down the options.

Terminology Review

- Web Content Management System (CMS or WCMS)—A software system that makes it relatively easy for non-programmers to contribute, collaborate, and administrate a website.
- "What You See Is What You Get" (WYSIWYG) Editor—A software interface that lets users design a website using visual elements rather than code so it's possible to see what a document will look like as a finished product.
- Front-end designer—A web designer who focuses his or her efforts on the visual, user facing interface of a website or application. This person generally uses HTML, JavaScript, and CSS extensively, as well as desktop graphic design programs.
- Localization—Customizing or adapting a website or application to a specific country or region.
- Open source software—Software that's source code is available to the public.
- Versioning—The process of differentiating versions of software, generally with a name or unique version number.
- RSS (Really Simple Syndication)— A web feed format that is used to

publish web content such as blog posts or news stories.

Chapter IV

PRESENTATION

Content is presented visually on a web page with the help of HTML and CSS. Content such as text and images are presented on the page through HTML tags. Once content has been tagged in HTML, designers are able to style the content contained within the tag by using Cascading Style Sheets, or CSS. These components represent the presentation layer and help define how the content will appear visually to the user.

HTML

HTML tags

For some people, the thought of writing code makes them want to hide in a cave. Don't go buying spelunking gear just yet. HTML is really nothing but a way of organizing content into a simple, logical format. HTML reads from top to bottom, left to right. Content elements and sections of the site such as headings, paragraphs, and footers are defined in a series of what we call "tags." This is the basic structure of any HTML page:

```
<html>
    <head>
    </head>
    <body>
    </body>
</html>
```

All HTML tags use the same formatting, beginning with a less-than sign: < and ending with a greater-than sign: >. The information between the < and > is used to identify the tag. Most tags have a bookend format, like this example of a list item:

```
<li>This is a line in the list</li>.
```

The information that appears on the page is contained between the bookends. However, some tags, such as the line break tag <br>, can be used without an ending because nothing is contained between. These tags are the building blocks of HTML, and learning them is the key to creating websites. The most important thing to learn about tags is that they are the web's way of defining content. For instance, the tag for a paragraph is "p":

```
<p>Jack and Jill went up a hill.</p>
```

Using old HTML standards, we used HTML tags to control presentation elements such as <B> for bold, <I> for italics, etc. Current web standards suggest that it is better to separate content from presentation as much as possible—in other words, define the structure of the document in HTML, and control how it displays using CSS (we'll get to that later). This is an important concept that will be reiterated throughout this chapter. Separating content from presentation makes it possible to mark keywords using and tags, which have the same effect but comply with the latest standards. So instead of writing:

```
<b>Chris</b> and <i>Hall</i>
```

which directly affect presentation and can only be manipulated directly in HTML, we write:

```
<strong>Chris</strong> and <em>Hall</em>
```

which are standardized tags that can be manipulated in CSS.

Attributes

Attributes are used to add additional information to HTML tags. When a web browser interprets a tag, it will also search for set attributes and then display the element (tags+attributes) in its entirety. Attributes are placed within the opening tag and they follow a precise syntax. Many tags can accept style information as attributes, such as adding a background color to the body element. That would look something like this:

```
<body background-color="red"></body>.
```

Remember, we would never want to do something like this because we

want all of our styles to be contained in the CSS. However, there are many attributes that affect interactivity, like the “target” attribute of a hyperlink. The target attribute affects whether a link is opened in the existing browser window or in a new window. By setting the attribute in a link like this: Click Here the link will open up in a new window. By not setting the attribute, or setting it to target=“_self”, the link will open in the existing window.

Many tags are assigned default attributes. This means that unless you specify a tag attribute, it will automatically display a set attributes. For example, a paragraph tag will always align its text to the left unless it has an align attribute in it specifying otherwise. Elements placed within a table are vertically centered and to the left unless otherwise specified. With practice using the different HTML elements, these defaults will become more familiar.

Marking up content pages semantically using XHTML

While the list of HTML tags is extensive, there are a few tags are used repeatedly. There are also tags that were used in the early days of the Internet that shouldn’t’ be used anymore (mostly because they affect presentation). Some HTML tags have been deprecated, meaning that the HTML code base no longer supports them. It is best to know what tags should be used for each situation. The following table contains a list of HTML tags, including some that are no longer used, and explains what they are for and how they should be used (Hunt, 2010):

tag	What it is	When to use it
<a>	Anchor (most commonly a link)	Use to create links in content, most often to jump to another place on the same page vertically. Use the title attribute whenever the contents of the <a>… pair do not accurately describe what you’ll get from selecting the link. Title attribute often displays as a tooltip in visual browsers, which may be a helpful usability aid.
<abbr>	Defines an abbreviation	Works in a similar way to <dfn> and <acronym>, using a title attribute (displays a tooltip in standard visual browsers). e.g,. <abbr title=”Hypertext markup language”>HTML</abbr>
<ACRONYM>	Defines an acronym	Works in a similar way to <abbr> and <dfn>, using a title attribute (displays a tooltip in standard visual browsers).

<ADDRESS>	Used for marking up a physical (e.g., mailing) address	Not commonly used. Recommend looking into microformats, which allow for more detail and interoperability.
<APPLET>	Inserts a Java applet	The old way to insert a Java app. Use <object> instead today.
<BASEFONT>	Sets default font size	Display info—never use it. Set in the CSS.
<BIG>	Larger text	Display info—never use it.
<BLINK>	Makes text blink	If you have a conscience, please never use this.
<BLOCK-QUOTE>	Large block of quoted text	Use for any quoted text that constitutes one or more paragraphs (note: should contain <p> tags as well). Use <q> for quotations within a paragraph. Often used in conjunction with <cite> to cite the quotation's source.
<BODY>	Document body	Essential
 	Line break	This is arguably display information. Still commonly used, but use with restraint.
<B>	Bold text	Display info—never use it. Set in CSS.

<BUTTON>	Used for a standard clickable button within a form	Often better than <input type="button" /> or <input type="submit" />, as it allows you to assign different styles based on the HTML element alone; whereas, differentiating style based on the type of input is less well supported.
<CAPTION>	Caption for a table: describes the table's contents	The correct way to assign a title to a table.
<CAPTION>	Caption for a table: describes the table's contents	The correct way to assign a title to a table.
<CENTER>	Centered block of content	Display info—never use it. Use or some other block-level tag with the style "text-align:center" instead.
<CITE>	Defines a citation	Defines the source of a quotation (in conjunction with content in <q> or <blockquote> pairs).

<CODE>	Defines an extract of code	Not commonly used. Similar to <pre> tag, but collapses consecutive white spaces and line breaks in the source.
<COL>	Identifies a particular column in a table	Can be very useful. For example, <col class="namecol"> can be applied to each first column in a series of tables, then the width of each column may be set to be equal in the style sheet, overriding the table's natural tendency to adjust its own column widths to fit its contents.
<DFN>	Definition of a term	Works in a similar way to <abbr> and <acronym>, using a title attribute (displays a tooltip in standard visual browsers).
<DIR>	Directory list	Now deprecated. Use a standard or other list instead.
<DIV>	Division	Specifies a logical division within a document. Use it to separate or identify chunks of content that are not otherwise distinguished naturally using other tags. One of the most common HTML tags.
<DL>	Definition list	Contains one or more definition-term / definition-description pairs.
<DT>	Definition term	Used as part of a <dt></dt><dd></dd> pair within a definition list (<dl></dl>).
<DD>	Definition description	
<EM>	Emphasis	Commonly used in place of the old <i> (italics) tag to indicate emphasis (but less than).
<FONT>	Font settings	Display info— never use it. Set in CSS.
<FORM>	Input form	Essential for data input.
<H1>	Level 1 header	Aim to have one H1 on each page, containing a description of what the page is about.
<H2>	Level 2 header	Defines a section of the page.
<H3>	Level 3 header	Defines a sub-section of the page (should always follow an H2 in the logical hierarchy).
<H4>	Level 4 header	Etc. Less commonly used
<H5>	Level 5 header	Less commonly used. Only complex academic documents will break down to this level of detail.
<H6>	Level 6 header	Less commonly used.

<HEAD>	Document head	Essential. Contains information about a page that does not appear on the page, such as links to JavaScript and CSS files
<HR>	Horizontal rule	Display info with no semantic value —never use it. “Horizontal,”, by definition, is a visual attribute.
<HTML>	Core element of every web page.	Every time you create a website
<IMG >	Show an image	Vital. Always use the alt or longdesc attributes when the image has content value.
<INPUT>	Input fields within forms	Vital. (I prefer to use <button> for buttons and submit buttons though).
<ISINDEX>	Old type of search input	Not really used any more. Use <form> instead.
<I>	Italicized text	Display info—never use it.
<KBD>	Keyboard input	Display info—never use it.
<LINK>	Defines a relationship to another document	Commonly used to reference external style sheets, but has other minor uses.
<LI>	List item	Specifies an item in an unordered or ordered list (or).

<MAP>	Client-side imagemap	May have occasional value, but only use when absolutely necessary when the goal cannot be accomplished through other means such as JavaScript.
<MARQUEE>	Makes text scroll across the screen	See <blink>.
<MENU>	Menu item list	Deprecated. Do not use. Use other standard list types instead.
<META>	Meta-information	Useful way to insert relevant information into the <head> section of the page that does not need to be displayed, such as keywords.
<OL>	Useful way to insert relevant information into the <head> section of the page that does not need to be displayed, such as keywords.	Type of list where the order of elements has some meaning. Generally rendered with item numbers (best managed with CSS).

<OPTION>	Selection list option	Vital for options within a drop-down control.
<PARAM>	Parameter for Java applet	Used in conjunction with an <object> or <applet> tag to pass additional setting information at runtime.
<PRE>	Preformatted text	Renders text in a pre-formatted style, preserving line breaks and all spaces present in the source. May be useful. (This one's a paradox, as it is strictly display info that applies only to visual browsing, but it's still so commonly used and useful that I'm hesitant to advise against using it.)
<P>	Paragraph	Only use to denote a paragraph of text. Never use for spacing alone.
<Q>	Short quotation	Use for inline quotations (whereas <blockquote> should be used for quotations of a paragraph or more). Often used in conjunction with <cite> to cite the quotation's source.
<SAMP>	Denotes sample output text	Similar to the <code> tag. Rarely used. Avoid.
<SCRIPT>	Inline script (e.g,. JavaScript)	It's better to have all scripts as separate files than to write inline or in the <head> section; however, still has its uses.
<SELECT>	Selection list	A drop-down selector for a form.
<SMALL>	Smaller text	Display info—never use it.

<SPAN>	An inline string of text	Use to apply meaning (and style) to a span of text that goes with the flow of content (whereas a tag is block-level and breaks the flow).
<STRONG>	Strong emphasis	Use this instead of the old <b> tag.
<STYLE>	CSS style settings	Normally used in <head> section of a page. Try to use external style sheets to enable you to apply different styles for different output media.
<SUB>	Subscript text	Arguably display info— recommend using alternative tags (e.g,. <cite>). May be required in some academic uses, e.g., chemical formulas.
<TABLE>	Table	Use for repeated data that has a naturally tabular form. Never use for layout purposes.

<TD>	Table data cell	A cell containing actual data. If a cell actually contains a descriptor or identifier for a row or column, use a <th> (table header) tag, not a <td>. This usually applies to column headers (within a <thead>), column footers (within a <tfoot>), as well as row headers (usually the first cell in a row in the <tbody>).
<TEXTAREA>	Multi-line text input area	Essential for use within a form.
<TH>	Table column or row header cell	May appear in a <thead> (to denote a column header cell), <tbody> (to denote a row header), and in <tfoot> (to denote a column foot cell, e.g., a total).
<TBODY>	Indicates the main body of a data table	It is always worth using this tag, as well as using <thead> and <tfoot> where appropriate. Note that it is permissible to have more than one <tbody>, <thead>, and <tfoot> in the same table.
<THEAD>	The head section of a table	The place to put column header cells (<th>).
<TFOOT>	The foot section of a table	Good place to put sample summary data, such as totals. Note that it goes before the <tbody> tag.
<TITLE>	Document title	Essential
<TR>	Table row	Essential with tables
<TT>	"Teletype" - simulates typewriter output	Similar to <pre>, except that it collapses white space like normal HTML (whereas <pre> leaves all consecutive white space intact). Avoid if possible.

tag	What it is	When to use it
<UL>	Unordered list	Essential. Use for lists where the order or items has no particular importance.
<U>	Underline text	Display info—never use it.
<VAR>	Variable in computer code	Obscure tag. May only be useful in academic documents. Avoid.

Cascading Style Sheets

Using Cascading Style Sheets (CSS) is the recommended way to control the presentation layer in a web document. If you think of a website as a house, HTML might be the wood and brick that form the structure, while CSS is the paint and décor. If you want a red house, wouldn't it be easier to paint it red than buy all red materials? The main advantage of CSS over presentational HTML markup is that the styling can be kept entirely separate from the content. Why is it so important to keep the content and presentation separate? Consider working on a site that has 1,000+ pages (this is not uncommon for a medium-sized business). If there were a heading element on each page that was red and you needed to change it to blue, you would need to make that change to all 1,000 pages. However, if you used CSS, you would be able to change the color in only one document and the change would automatically occur on all 1,000 pages. CSS help save time and avoid the headaches associated with the varying changes that inevitably occur during the design process.

Benefits of using CSS

- All styling is kept in a limited number of style sheets. The positive impact

this has on site maintenance can't be overestimated—editing one style sheet is obviously more efficient than editing hundreds or thousands of files.

- The overall saving in bandwidth is measurable. Since the style sheet is cached after the first request and can be reused for every page on the site, it doesn't have to be downloaded with each web page. Removing all presentational markup from your web pages in favor of using CSS also reduces their size and bandwidth usage—by more than 50% in many documented cases. This benefits the site owner, through lower bandwidth and storage costs, as well as the site's visitors, because the web pages load faster.
- The separation of content from presentation makes it easier for site owners to reuse the content for other purposes, such as RSS feeds or text-to-speech conversion.
- Separate styling rules can be used for different output media. We no longer need to create a special version of each page for printing—we can simply create a single style sheet that controls how every page on the site will be printed.

Inheritance

So why are they called Cascading Style Sheets? One of the most powerful properties of CSS is its inheritance abilities. Unlimited numbers of CSS files can be linked, and each one will inherit the properties of the one before it (or its parent). When an element inherits a value from its parent, it is inheriting its computed value. What does this mean? Every CSS property goes through a four-step process when its value is being determined. Here's an excerpt from the W3C specification:

The final value of a property is the result of a four-step calculation: the value is determined through specification (the "specified value"), then resolved into a value that is used for inheritance (the "computed value"), then converted into an absolute value if necessary (the "used value"), and finally transformed according to the limitations of the local environment (the "actual value") (World Wide Web Consortium, 2012).

In other words:

- Specified value—The user agent determines whether the value of the property comes from a style sheet, is inherited, or should take its initial value.
- Computed value—The specified value is reconciled to a computed value and exists even when a property doesn't apply. The document doesn't have to be laid out for the computed value to be determined.
- Used value—The used value takes the computed value and resolves any dependencies that can only be calculated after the document has been laid out (like percentages).
- Actual value—This is the value used for the final rendering, after any approximations have been applied (for example, converting a decimal to an integer).

Any CSS property's specification defines its initial (or default) value, the elements it applies to, its inheritance status, and its computed value (among others). For example, the background-color specification states the following:

- Name: background-color
    - Value: <color>
    - Initial: transparent
    - Applies to: all elements
    - Inherited: no
    - Percentages: N/A
    - Media: visual
    - Computed value: the computed color(s)

Confusing? It can be. So, what do we need to understand from all this? And why is it relevant to inheritance? When an element inherits a value from its parent, it inherits its computed value. Because the computed value exists even if it isn't specified in the style sheet, a property can be inherited even then: the initial value will be used. So, you can make use of inheritance even if the parent doesn't have a specified property. In other words, a CSS document will inherit all of the values specified in all of its parent documents no matter how long the

chain is. If there were 4 generations of CSS documents linked to an HTML file and only the first parent defined the background color, the background color would be whatever was defined in the first parent.

Incorporating CSS

There are three ways to apply CSS to web pages: inline styles, in-document styles via the <style> tag, and linked style sheets. Each one is useful in different scenarios.

Inline styles

Inline styles are the most basic way of applying styles to an element, meaning the styles are applied directly to the tag in your HTML. For example, this is an inline style:

```
<p style="font-size: 200%;">
    This text will be twice the size of your other paragraphs.
</p>
```

Inline styles are most useful when trying out new tags. In the example above, if there were several paragraphs on the page, we could easily try out several styles on several paragraphs to more quickly find the exact look we were going for. It's also useful for overriding a more global style in one specific instance; when inline, in-document, and linked CSS are all present at the same time, inline styles take precedence. Another common use is avoiding the chance that an externally linked file won't work. For instance, many email providers censor images and some HTML code in emails by default to protect users from spam. However, in terms of maintainability there is no difference between styling this way and using HTML presentation elements. Remember, we want to keep as much of the visual styling separate so that we can edit presentation in one place, not many.

Embedded styles

In-document, or embedded, styles make use of the <style> tag within the HTML document's head, like so:

```
<style>
    p {font-size: 200%;}
</style>
```

This technique is best used when there is one page that needs to be styled differently from every other in the website. It maintains the flexibility to apply styles to the entire document, and those styles have the opportunity to cascade and change broad swaths of the page with little effort. But to apply these styles to more than one page, there are two options: copy and paste the styles into all your documents (messy, if you ever make any changes) or use linked style sheets.

Linked style sheets

Linked style sheets are the most common and preferred method for applying CSS to a website. Here, the CSS resides in a separate document, outside of the HTML entirely. It is linked to the document's head like this:

```
<link rel="stylesheet" href="style.css" media="screen" />
```

There are three important pieces of code to explain:

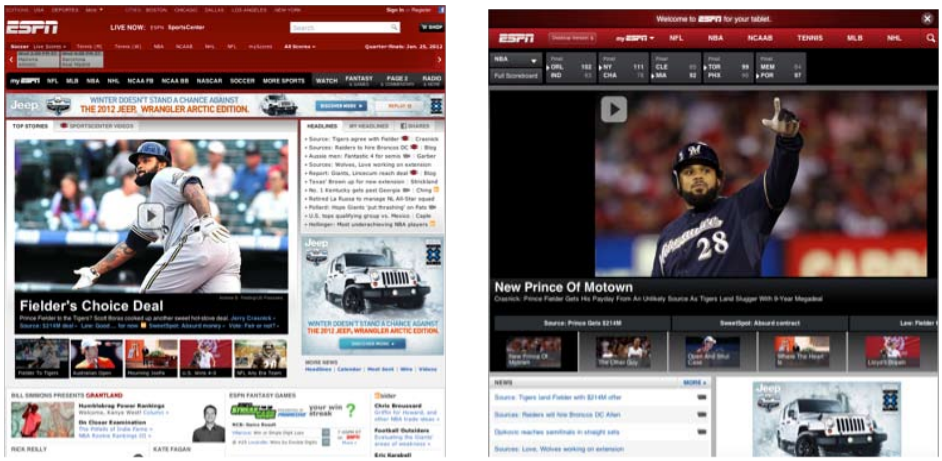
- `rel:` Stands for "relationship." Tells the browser that this is a style sheet.
- `href:` Stands for "hypertext reference." This is how the browser knows where to find the style sheet. If it's in a different directory, that should be shown in the href.
- `media` (optional): Says that this style sheet should be applied to the screen. If omitted, it will still be applied to the screen.

Most importantly, this one line of code can be included in the top of every page to be styled (between the <head> and </head> tags), and the browser takes care of the rest. Now if any changes are made to the CSS, it can be changed in just that one file, and the changes will take place automatically across the entire site. Hooray!

Responsive Web Design

The expanding world of new media has presented some notable problems for web designers. Many new devices use different screen sizes, and

web **mobile**



unless a site is configured to adapt to different sizes, it can become unusable. Think about going to espn.com on a tiny phone

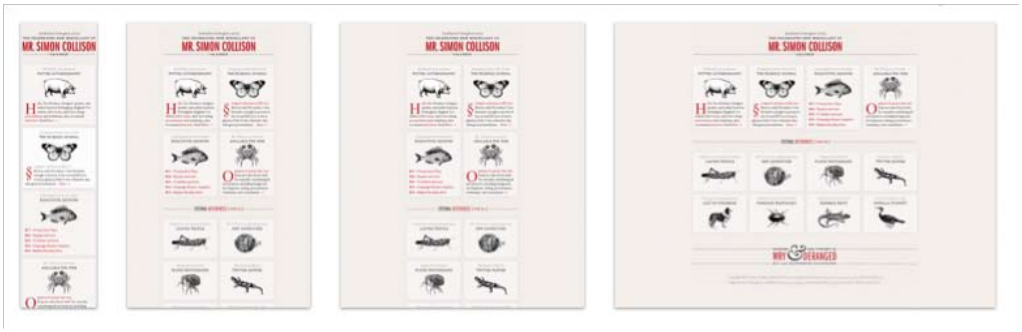
browser. The overwhelming amount of content would make it impossible to read or navigate. CSS allows websites to detect which screen size is viewing the website and adapt the look and feel accordingly.

Print styles

Despite the massive headway technology has made toward moving from paper-based business to digital, the reality is that we are still far from a paperless world. If you ever tried to print a web page that didn't offer a solution for printing, you know that the design and even content of a website does not always go through to printers well. The ability to print a website is useful and sometimes even necessary. Some readers might want to store web page information locally by saving it as a PDF so they can refer to the information later on, when they don't have an Internet connection. The good news is that a print style sheet is actually very easy to craft. The following simple CSS techniques can help create a good experience for readers and deliver a better user experience.

Media queries

CSS2 (the previous version of CSS) allows style sheets for specific media types, such as screen or print. Now CSS3 (the current version of CSS) makes it even more efficient by adding media queries. Expressions can be added to media type to check for certain conditions and apply different style sheets. For example, there can be one style sheet for large displays and a different style sheet specifically for mobile devices. It is quite powerful because it tailors to different resolutions and devices without changing the content. See the following example (Collison, 2012):



Keep in mind: having an optimized style sheet for mobile devices doesn't mean a website is optimized for mobile. To be truly optimized for mobile devices, the images and markups need to cut on the load size as well. Media queries are meant for design presentation, not optimization.

Validation

In the early days of the Internet, browser compatibility wasn't much of an issue. There were only a couple of browsers that owned the majority of market share, and the way they rendered HTML was similar enough that websites appeared pretty much the same on all of them. Times have changed, and there are an ever-increasing number of browsers and mobile devices accessing the web, each of them interpreting websites differently.

This diversity of access and browser types can lead to problems and frustrations for some users whose browser won't display HTML content in the way it was originally intended. It falls to the web developer to try and make HTML files universally accessible and available to anyone using any browser, at any time, using any device. While it's a good idea to detect devices and browsers and serve up content specifically for those devices using media queries, the best place to start is using standard versions of HTML and then validating the HTML source that is produced.

Once the complete HTML file is created and deployed on a website, it can be checked using an online validator service. The service offered by the W3C at http://validator.w3.org is a great place to start. This validator service lets the developer check a page for compliance with W3C standards by simply entering the URL and hitting a button. What will be returned is a list of errors that are on the page. Any site that uses CSS, can be checked using the CSS validator, available through a link from this service.

Sources

Collison, S. (2012). Media Queries. Retrieved from www.mediaqueries.es: http://mediaqueri.es/sc/

Hunt, B. (2010). Complete List of HTML/xHTML Tags, With Guide to Proper Semantic Use. Retrieved December 2011, from webdesignfromscratch.com: http://www.webdesignfromscratch.com/html-css/list-of-html-tags-with-semantic-usage/

World Wide Web Consortium. (2012). Assigning property values, Cascading, and Inheritance. Retrieved from www.w3.org: http://www.w3.org/TR/CSS2/cascade.html

Terminology Review

- HTML tag—The method by which HTML elements are defined in HTML documents.
- Attribute—Modifiers of HTML elements that may assign value to different element properties.
- Cascading Style Sheets (CSS)—A style sheet language used to describe the presentation of a document written in a markup language, usually HTML or XML.
- Inheritance—The ability of CSS to allow a document's style to be influenced by multiple style sheets.
- Inline style—CSS placed on a single HTML element, specified using the "style" attribute.
- Embedded style—Blocks of CSS information inside the HTML itself.
- Linked style—A separate CSS file referenced from the document.
- Responsive web design—The use of media queries to adapt the layout of a web page to the environment that it is being viewed in.
- HTML validation—Software that allows users to check HTML and XHTML documents for well-formed markup that adheres to W3C rules.

Chapter X

BEHAVIOR

Website behavior is created with a combination of client-side and server-side technologies. These technologies use scripting languages such as JavaScript and PHP that can be programmed to add functionality. These languages generally use object-oriented programming principles and can interact with databases to display content. In this chapter we will explore common client- and sever-side technologies and their roles.

Object Oriented Programming (OOP)

OOP is a programming paradigm used to simplify complicated programming concepts. Object-oriented programming consists of objects, properties, methods, and events. Think of an object as a black box that stores information. An object can really be anything; it could refer to a real world object, such as a bank account or even a real person, or it could refer to something more abstract like complex groups of interlinked data. It can refer to objects on a web page or to the web page itself. Methods allow a programmer to retrieve and/or change that information. The information contained in the object make up its properties.

Objects and properties

If you think about a website in the context of object-oriented programming, not only is the web page an object, but any table, form, button, image, or link on the page is also an object. Each object has inherent properties, such as color or opacity. For example, in JavaScript the background color of your document is written document.bgcolor. You would change the color of your page to black by writing the line: document.bgcolor=”black”. Or, the contents (or value) of a textbox named “password” in a form named “entryform” would be document.entryform.password.value.

Methods

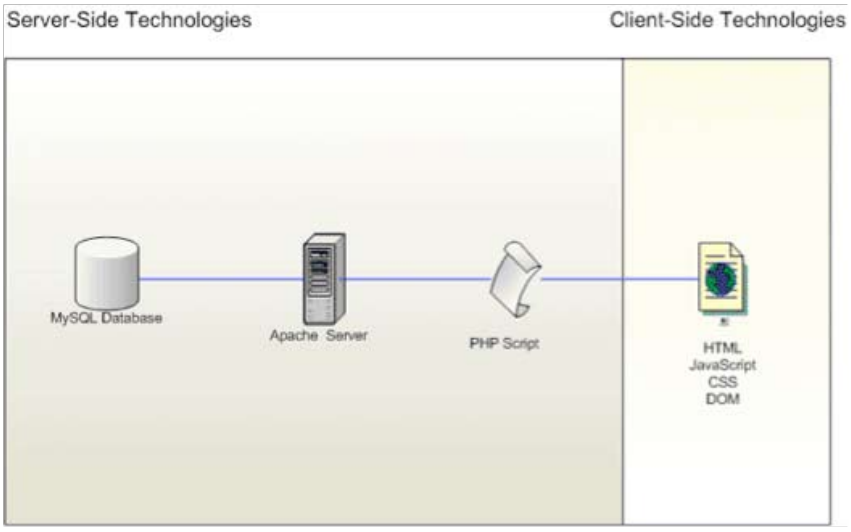
Objects can do different things. Methods are the commands that tell an object what to do. Think of a simple toggle switch on a light bulb. The bulb object can turn off or turn on, and the toggle switch is the method by which the light is operated. Some objects can do several different things that require different methods. In JavaScript, a new document is opened with the method document.open(). You can write “Hello World” into a document by typing document.write(“Hello World”). The words “open()” and “write()” are both methods of the object “document.”

Events

Think of events as the trigger that initiates methods. Events allow us to listen to what is happening in our application and program reactions that produce interactivity. A simple example is a button, whose definition includes the words onClick=”run_my_function()”. The onClick event, as its name implies, will run the function when the user clicks on the button. Other events include OnMouseOver, OnMouseOut, OnFocus, OnBlur, OnLoad, and OnUnload.

Client-Side Technologies

Client-side technologies contain functionality that operates within the browser on the user’s computer. HTML, CSS, and JavaScript code is all processed and rendered in the browser.



JavaScript and ECMAscript

JavaScript is one client-side scripting language that can be used to affect the behavior of your website. JavaScript can be embedded in the header web pages and control the behavior of elements on the page. With JavaScript, you can perform calculations, check forms, write interactive games, add special effects, customize graphics selections, create security passwords, and more.

Languages like JavaScript and Actionscript (The Adobe Flash equivalent of JavaScript) are dialects of ECMAscript. ECMAScript is the foundation of client-side scripting languages and was designed to add interactivity to web pages. Think of the browser as a host environment in which ECMAscript can manipulate windows, menus, pop-ups, dialog boxes, text areas, anchors, frames, history, cookies, and input/output. The browser also allows ECMAscript to listen for events, such as change of focus, page and image loading, unloading, error and abort, selection, form submission, and mouse actions. In this way, JavaScript allows for intense interaction and response to a user's actions.

Ajax

Ajax stands for "Asynchronous JavaScript and XML" and represents a group of interrelated web development techniques used on the client side to create asynchronous web applications. Ajax is not a single technology, but a group of technologies being used together. HTML and CSS can be used in combination to mark up and style information. Documents provided by server-side scripts are accessed with JavaScript to dynamically display and allow the user to interact with the information presented. With Ajax, web applications can communicate with the server side without interfering with the display and behavior of the existing page. Data is usually retrieved using the XMLHttpRequest object. Despite the name, the use of XML is not needed (JSON, a format similar to XML is sometimes used instead), and the requests do not need to be asynchronous. The big benefit of Ajax is that data can be retrieved and the information on a page can change without having to refresh the browser.

JavaScript libraries

Programmers tend to be nothing if not efficient. As demand for sites that use JavaScript has increased, time-saving frameworks began to emerge that

- Respond to user queries or data submitted from HTML forms
- Access any data or databases and return the result to a browser
- Customize a web page to make it more useful for individual users
- Provide security, as your server code cannot be viewed from a browser

(w3schools, 2012)

Apache HTTP Server

It's important to understand the difference between web server hardware and web server software. Web server hardware is the actual physical piece of hardware that crunches the ones and zeros, while the server software is similar to an operating system that is installed on a computer—it allows a user to tell the system what the server should do. Apache, otherwise known as Apache HTTP Server, has been the most popular web server software on the Internet since April 1996. It is an open-source web server platform that has been developed by an open-source community and is free to use.

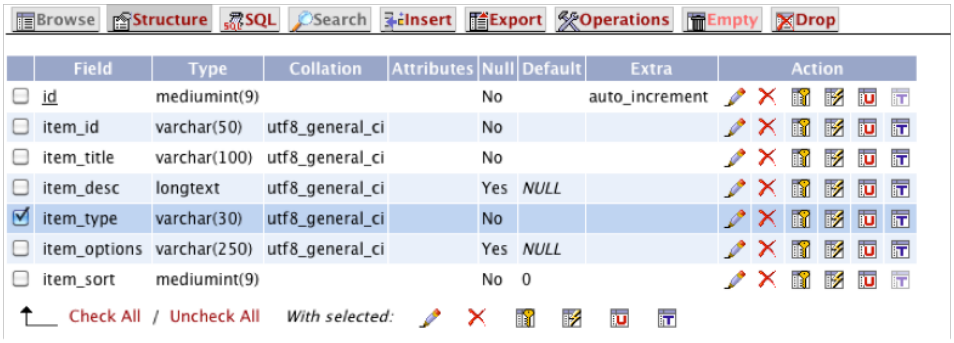
Databases

Most websites today store their data in a database. This is especially common in web content management systems, which use databases to store content as well as presentation information. While most general users don't need to know how to create a database from scratch, it is helpful to have an understanding of how they work, because it can help direct content creation for a site.

The easiest way to think about a database is as a group of spreadsheets, with each spreadsheet representing a table in the database. Each table contains rows and columns where data are stored. With that in mind, think about what the website will need to do. For example, if the site will contain a members-only section, start by making a list of everything that a user will need to be able to do. For instance, will they make posts, upload files or photos, or send messages?

MySQL

The MySQL database is the most commonly used database software. It is maintained and deployed by the open-source community. Server-side administration programs, such as phpMyAdmin, allow non-programmers to edit and maintain MySQL database easily.



Data modeling tools

Once, the data that needs to be stored has been identified, a data modeling tool can be used to organize it in a way that will be meaningful for the developer who may be implementing the database. Many modeling tools support visual database models, such as MySQL Workbench (for MySQL databases only) or DBDesigner4. Both of these tools allow for creating flowcharts and database models. Organizing data is an opportunity to work through how a user will interact with the data that is being stored. Will they need to search for their favorite recipe or look up products? How are the recipes or products categorized? If someone does a search for products, what information will appear (images, descriptions, etc.)?

Relational databases

Nearly all databases are relational. This means that the tables in the database are related to each other in some way. For example, if a there is a member

on an ecommerce website, that member may be related to certain products based on what he or she ordered last, or what he or she has expressed an interest in. For a blog database, authors would have to be somehow related to the posts they wrote, and logged in users could be related to any comments they've left. By using relational database techniques, it is possible to store large amounts of data in an organized fashion in separate tables: one table for members, one for posts, another for comments, and yet another for products. Then, we can link the data between different tables together via unique keys.

In a database, every entry in every table can have a unique primary key. Think of this as the "bar code" for each entry. The primary key is unique to each entry, and no other entry can have the same key, or ID, in the same table. The reason for this key is that it's possible for multiple fields to be seen as duplicates if they contain the same data, so this adds another layer of separation Even with other types of unique fields, a database is still vulnerable to duplicate records, which can later break code within the website.

To form a relationship between two tables, we use a foreign key, which is just a number ID that references a unique key in another table, usually our primary key. As an example, below we can see that our first table for authors has three authors with their own unique ID. In the separate articles table, we link each article to an author via that ID. We can now look up the author for the first article, and vice versa, and see that Tom has two articles, Mary has one, and Jane has none yet.

ID	NAME
1	Mary
2	Tom
3	Jane

ID	ARTICLE	AUTHOR_ID
1	Article One	2
2	Article Two	1
3	Article Three	2

Data fields

Within fields, it's also important to know when to group certain pieces of data together and when to keep them separate. A good way to determine which information should be in the same field, or otherwise, is to think about what it would take to change that piece of information if necessary. For example, would it be necessary to place a full address in separate fields based on 1) street address, 2) city, 3) state, 4) zip code, and 5) country? Is it essential for the functionality of the site (perhaps users or admins would need to search addresses by state only), or is it just a waste of fields and database space? Just to change an address, the database would have to update five separate fields, but if keeping the data separate is not essential, it could just be organized in such a way that only one field would need to be updated in string form. In order to keep such a field organized, one could take in the address information via an HTML form with these fields separated, but then concatenate all of it into one single string before placing it into the database. This is just one example, but always try to keep in mind the most efficient ways to organize table fields, and when to combine them or keep them separate for the sake of the website's functionality.

Sources

w3schools. (2012). Server-side Scripting Primer. Retrieved from www.w3schools.com: http://www.w3schools.com/web/web_scripting.asp

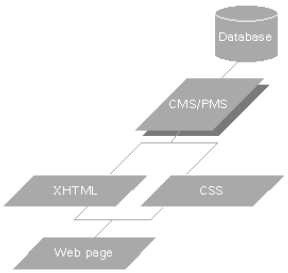
Terminology Review

- Object-oriented programming—A programming paradigm used to simplify complicated programming concepts.
- Server-side technologies—A web server technology in which a user's request is verified by running a script directly on the web server to generate dynamic web pages.
- Client-side technologies—Scripts that are executed by the viewing web browser.
- Objects—Data structures consisting of data fields and methods together with their interactions.
- Properties—Values associated with an object.
- Methods—The commands that tell an object what to do.

allowed developers to reuse chunks of code to accomplish common tasks. The frameworks have matured into JavaScript libraries, such as Prototype, script.aculo.us, Ext Core, MooTools, and jQuery. JavaScript widget libraries, such as Ext JS, DHTMLX, and Dojo Toolkit were also developed, allowing developers to concentrate on more distinctive applications of Ajax. In fact, Microsoft and Yahoo! Have developed their own JavaScript-based user interface libraries in order to help them save time internally. Some JavaScript libraries allow for easier integration of JavaScript with other web development technologies, such as CSS, PHP, Ruby, and Java. Many libraries include code that detects differences between runtime environments, removing the need for applications to allow for such inconsistencies. These libraries can save programmers a tremendous amount of time and allow them to add complex interactions easily. In most cases, the library can simply be imported into an HTML document with a single line of code and added interactions.

```
<script src="jquery.js"></script>
```

Server-Side Technologies



Server-side scripting takes place directly on the server, as opposed to within the browser, as in client-side scripting. Sever-side scripting is generally used to handle secure data transfer, generate dynamic web pages, and interface with databases. The primary advantage to server-side scripting is the ability to customize the response based on the user's requirements, access rights, or database queries. Server-side scripting allows for secure data transmission, because server-side scripts are never visible to the browser as these scripts are executed on the server and emit HTML corresponding to user's input to the page.

What can server scripts do?

- Dynamically edit, change, or add any content to a web page

- Events—Triggers that allow developers to “listen” to what is happening in an application and program reactions that produce interactivity.
- Ajax—A group of interrelated web development techniques used on the client side to create asynchronous web applications.
- Relational databases—Databases that are related to each other in some way.

Chapter XI

DESIGN CONCEPTS

While the look and feel of a website can be somewhat subjective, it's helpful for communication professionals to understand some basic design fundamentals in order to make useful design contributions to a web project. Understanding compositional concepts like balance and proportion will also ease communication with graphic designers, who are likely to understand these concepts.

While a good design can contribute to the usability of a website, it is possible to have a beautiful site that is not usable, or a usable site that is not beautiful. Consider Jakob Nielsen's alertbox website. While it adheres to nearly every usability rule (Jakob Nielsen is widely considered an expert on web usability), it lacks the visual eloquence that makes other sites more engaging.


useit.com: Jakob Nielsen's Website

Permanent Content

Alertbox
Jakob's column on Web usability

Browser and GUI Chrome (January 30)
"Chrome" is the user interface overhead that surrounds user data and web page content. Although chrome obesity can eat half of the available pixels, a reasonable amount enhances usability.

Thinking Aloud (January 16)
10 Best Intranets of 2012 (January 3)
Overloaded vs. Generic Commands (December 19)

435 Alertbox columns from 1995 to 2012

Sign up for newsletter by email when a new Alertbox is published

Reports

Agile usability
Application design showcase: 10 best App UIs
Intranet usability
- Intranet design annual
- Enterprise 2.0
- Intranet portals
- Design guidelines for intranets, vols. 1-10
- Intranet IA
- Sector-specific: financial, government, tech
E-commerce (13 vol. series) and B2B sites
Email newsletters
Return on investment for usability (ROI)
Age groups: Children, Teens, Students, Seniors
Donations to non-profits
Corporate sites: company image, PR, IR
Mobile sites

More reports and usability guidelines

Training Video

Paper prototyping: 40 minute how-to video (Blu-Ray & DVD)

Books

Eyetracking Web Usability
Prioritizing Web Usability
Designing Web Usability: The Practice of Simplicity

News

Usability Week 2012 Conference
- New York City: Feb. 26 – March 2
- Las Vegas: March 11-16 (includes 2-Day Camp)
- Edinburgh: March 19-23
- San Francisco: April 2-7
- Amsterdam: April 23-27
- Washington, DC: May 14-18

Full-day training courses, including
- IA 1 (structure) & IA 2 (navigation)
- Fundamental Guidelines for Web Usability
- Mobile Sites & Touchscreen Apps
- Visual Design for Mobile (2-day course)
- Apps Design 1 (GUI) & Apps Design 2 (workflow)
- Web Page Design & Emerging Design Patterns
- Writing for the Web (2 days) & Writing for Mobile
- The Human Mind: How Your Users Think
- UX Basic Training

Tweets from the conferences

BBC The Daily Mail has mastered the art of the long website headline

Fox News Can a Standard Panic Button Save Lives?

New York Times As Kindle Fire Takes Heat, Remedies Are Promised

BusinessWeek Voice Control, the End of the TV Remote?

TabTimes User interface guru Jakob Nielsen: "Right now I think Kindle Fire is a bad bargain"

Sydney Morning Herald Computers: you don't know what you don't know ... but techs think you should

Click2 Usability for Mobile Sites and Apps

uTest.com Testing the Limits

The Independent Website redesign: Why do we get so angry when the websites we love update their look?

Ironworks Video report from Usability Week San Francisco (2:34 min. video)

Like any piece of collateral that a company produces (brochures, advertisements, business cards, etc.), it is important that your website is consistent in its branding. Websites are a great way to build a brand in ways that can't be achieved through other media. In many ways, a user's interaction with your website is as significant as their interaction with employees.

Composition

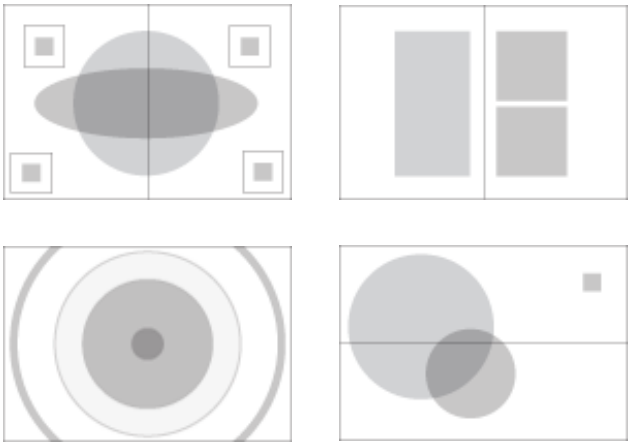
It's important to remember that despite all of the technology that makes up a website, it is a piece of art. Through their visual power, websites have the potential to be striking, evocative, and compelling. The first step to designing websites that accomplish their desired effect is to understand the basic elements of artistic composition.

Balance

Balance is the distribution of elements in a design as they relate to visual weight within a composition. Think of balance as an old fashioned scale with weights on either side. When the visual weight of both sides is even, balance

has been achieved. There are two types of balance: symmetrical and asymmetrical.

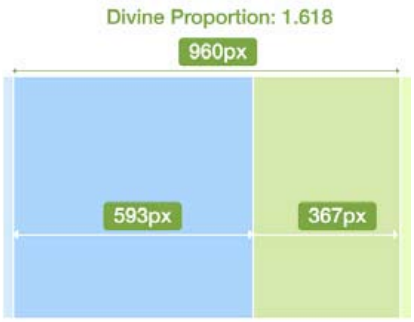
Symmetrical balance, also known as formal balance, describes designs that evenly distribute the weight of a composition around a central vertical or horizontal axis. The perfect example of symmetrical balance would be an image that is reflected on both sides of a page. When symmetry occurs with similar, but not identical forms, it is called approximate symmetry. When a composition has symmetry that extends around a center focal point, it is considered as radial symmetry.



Asymmetrical balance, also known as informal balance, describes designs in which the weight of a composition is not evenly distributed around a central axis. In asymmetrical balance, objects are not perfectly symmetrical on a one-to-one basis, but rather balanced on a different scale, such as one-to-many. Think of one large object on one side, and many small objects that have the same visual weight as the large object on the other side. In general, asymmetrical compositions tend to have a greater sense of visual tension.

Rhythm

Rhythm (also known as repetition) allows designers to develop an internal consistency that makes a design easier for the user to process. Once the brain recognizes the pattern in the rhythm, it can relax and understand the whole design. Nearly anything in a web design can be repeated to create a rhythm in a design. A headline can be repeated multiple times for emphasis, an image can be repeated across the top of your design, a patterned background with repetitive elements can be created, or a style element can be repeated throughout the pages of a site to provide consistency. The best kind of repetition is subtle and may be subconscious to the users, and it can help contribute to branding. For instance, if a company logo contains an arrow in it, using similar arrows as bullets in the design could establish repetition.



960px : 1.618 = 593px
960px - 593px = 367px

Proportion

Proportion refers to the relative size and scale of the various elements in a design. Some designers adhere to a layout concept known as the divine proportion or golden ratio. Some believe that this proportion is organic, universal, harmonic, and aesthetically pleasing when it is implemented in design. The proportion is accompanied by the rule of thirds, which states that every composition can be divided into nine equal parts by two equally spaced horizontal lines and two equally spaced vertical lines. The four points formed by the intersections of these lines can be used to place the most important elements—the elements that need a prominent or dominant position in the design. Aligning a composition according to rule of thirds creates more tension, energy, and interest than simply centering the feature would.

Dominance

Dominance is what attracts the eye upon seeing a design. Dominance through emphasis of one or more particular elements creates a focal point in the design. It's where most people will instinctively go when first looking at a designer's work. Dominance will create an entry point on the page from which the viewer can begin to explore other parts of the page. In general, the way to create dominance in an element is by adding visual weight.

Here are a few ways you can add visual weight to your designs:

Size—Larger elements carry more weight than smaller ones.

Color—Some colors weigh more than others. Red is considered the heaviest while yellow seems to be lightest.

Density—Packing more elements into a given space gives more weight to that space.

Value—A darker object will have more weight than a lighter object.

Whitespace —Positive space weighs more than negative space, or whitespace.

Unity

Unity is the relationship among the elements of a visual that helps them all function together. Unity gives a sense of oneness to a visual image, helping the words and images work together to create meaning.

Branding

Anyone involved in marketing spends a lot of time pondering their company's market position. Positioning is the process of putting a company's product in a specific place in an audiences mind and is the result of many factors, one of the most important being branding. Branding consist of the ways a company differentiates itself from others. One of the most important ways branding is established is through the visuals people associate with a com-

pany. In order to affect positioning, it is important that branding be consistent, especially through the web. Here are a few ways to make sure a website is consistent with a brand:

Color schemes

A color scheme is the palette, or set of colors, used to design a web site. Organizations often use consistent color schemes throughout their branding efforts. Customers can learn to identify specific shades with a company, and these shades can actually help position the company. For instance, if someone were creating a website for a recycling company, the use of the color green might help people understand that the company helps the environment. This association with environmental friendliness would attract certain types of users.

Character

More and more companies are incorporating character into their branding. Character refers to a brand's personality; if the company were a person, what kind of disposition they would have. Anthropomorphic elements are a good way to communicate character. This is a very important part of branding, because people tend to be attracted to brands that exhibit the same character traits as they do. They use brands to define themselves, and they choose brands largely based on character. Think about the icon for the "Finder" application on Mac OSX. Apple has always focused on turning cold, impersonal computers into warm extensions of human personality. The Finder icon is a blue square with a distinctive smiling face drawn with a few black lines. The program it represents is a file browser, but by giving it human characteristics, the designers gave it a soul.

Emotion

Emotion is another factor to consider when building a brand. Some questions to ask are: What feelings and emotions do you want people to experience when they visit your site? Or, what sort of things do you want them to associate with your brand? Images can have a big impact on the emotion of a design. Consider this shot of the site for a non-profit group that provides

clean water to impoverished areas. The striking image of a mother and her son scooping dirty stagnant water from a muddy stream provokes strong emotion and action. Emotion can also come from color. For instance, a site with a dominant red color might create anger.

Consistency

Consistency throughout the web design will build on the choices made regarding selecting the right personality for the brand and evoking the appropriate emotions. Keep consistent colors, visuals, and typography throughout to ensure the website projects a uniform image. Skype does this well, consistently integrating several branding elements throughout all of their marketing materials, which include the color palette with a dominant blue, white 2D clouds with illustrations and rainbows.

Logo

Most of the time, a designer will want to put at least one logo in the upper left-hand corner of a web page. That's where people are used to seeing one and where they will first go to look for it. However, there are other ways to put the logo in other places on the page to help contribute to the branding. For instance, a smaller version can be used in the footer.

Designing for the Web

Just like writing for the web requires some technical knowledge in order to be effective, designing for the web also requires some technical understanding. Three important things to keep in mind when designing for the web are the width of the site, typography, and contrast.

Site width

While it's a good idea to create responsive websites that can be viewed correctly on all types of media, it's also important to establish a good default that most users using desktop or laptop computers with traditional screen sizes will use. Screen resolutions on desktop computers continue to get larger and more detailed. While it used to be safe to design sites at 800px wide, it's now common to design them at 1000px or even larger. The most important thing to figure out is who will be visiting the site and what screen resolution is most prevalent among them. These stats are available through most analytic services.

Name	Website	Width
Facebook	facebook.com	980px
Yahoo	yahoo.com	990px
MSN	msn.com	970px
New York Times	nytimes.com	970px
Wikipedia	wikipedia.com	100%
Web Krunk	webkrunk.com	985px
WalMart	walmart.com	720px
NFL	nfl.com	985px
Best Buy	bestbuy.com	790px
Apple	apple.com	985px

Date	Higher	1024×768	800×600	640×480	Unknown
January 2010	76%	20%	1%	0%	3%
January 2009	57%	36%	4%	0%	3%
January 2008	38%	48%	8%	0%	6%
January 2007	26%	54%	14%	0%	6%
January 2006	17%	57%	20%	0%	6%
January 2005	12%	53%	30%	0%	5%
January 2004	10%	47%	37%	1%	5%
January 2003	6%	40%	47%	2%	5%
January 2002	6%	34%	52%	3%	5%
January 2001	5%	29%	55%	6%	5%
January 2000	4%	25%	56%	11%	4%

January 2010	
Resolution	% of Total
1280×1024	18.2 %
1280×800	17.3 %
1440×900	10.5 %
1680×1050	10.0 %
1920×1200	4.6 %
1366×768	3.6 %
1920×1080	2.3 %
1152×864	2.1 %
1600×1200	1.4 %
1280×768	1.2 %
Other	4.8 %

Typography

Typography on the web has changed immensely in recent years. Prior to font embedding technology, designers were constrained to the fonts that were available in a user's operating system. That meant that if a designer defined Helvetica as the font in a web page but a user did not have Helvetica installed on their computer, the font would not appear. A fallback font would be defined to take over if the

font was not installed. Sometimes, if a designer wanted to use a non-supported font, he or she would place the type in an image, increasing page load time and decreasing search engine optimization. Font embedding technology, however, makes it possible to use any font imaginable and the font is rendered in the browser so it appears the same for anyone using a browser that supports font-embedding.

Many free fonts are available for web design. Google has a repository with pre-packaged fonts that can be embedded by copy and pasting a simple line of JavaScript into a page. Fontsquirrel offers a free service that allows users to upload their own font and get a full web font package that can be used on the web (provided that the user has the legal right to use the font in this way).

Font embedding technology has changed the look of websites to allow for the same flexibility in typography design that print has always had. The typography selected will contribute heavily to the overall look and feel of a site and to the other branding factors we have discussed. In fact, it is not uncommon for large organizations to have a font created specifically for projects they are working on.

Contrast

No matter what color scheme is selected, be sure that when using text with a background, there is sufficient contrast to make the text readable. This may seem obvious, but the problem is so significant that an entire movement (http://contrastrebellion.com/)has begun on the web to help designers not make this mistake. One thing to keep in mind is that brightness and color can vary greatly on different user's screens. A screen that is old and dying may have les contrast capability.

Designers can also create typographic contrast and flow by emphasizing certain text. Contrast in the flow is important because not all the content within a page have the same value, some have greater significance than the others. By creating contrast, the reader's attention can be directed to the important messages and, at the same time, the site's appearance can be enhanced. This can be accomplished by using different text sizes and colors, and emphasizing text with bold, italics, or other treatments.

States

One important difference between designing for print and the web are the various states that occur in web interactions. For instance, a hyperlink can have four different states that can all have unique appearances: default, up, down, and visited. The default is the link as it appears when a user first arrives at the page. Up is when the user hovers over the link with the mouse. Down is the link as it appears when the mouse button is down as it is being clicked, and visited denotes a link that has already been clicked on. It's important to keep design consistency in mind when designing these various states.

Terminology Review

- Balance—The distribution of elements in a design as it relates to their visual weight within a composition.
- Rhythm—An internal consistency that makes a design easier for the user to process.
- Proportion—The relative size and scale of the various elements in a design.
- Rule of Thirds—The idea that every composition can be divided into nine equal parts, using two equally spaced horizontal lines and two equally spaced vertical lines.
- Dominance—An emphasis of one or more particular elements to create a focal point in a design.
- Unity—The relationship among the elements of a visual that helps all the elements function together.
- Color scheme—The palette, or set of colors, used to design a website.
- Character—The disposition or personality of a brand.
- Font embedding—Technology that allows non-system fonts to be displayed in the browser.

Chapter XII

GRAPHICS AND MULTIMEDIA

For many designers, the first step to creating a website is sitting down with graphic design software. While lower-fidelity programs like PowerPoint can be used to easily create wireframes, many designers prefer more complex applications like Adobe Photoshop for wireframes simply because they are more familiar with them. After wireframes have been approved, a pixel perfect design of the website is usually mocked up in a graphic editor that shows exactly what the site will look like on the web. This way, clients can see exactly what the site will look like early in the process, and revisions can be made rapidly without having to edit any code.

Using a Graphics Editor

While the code for a website can be created in a simple text editor, the graphics must be created using graphic design software. The industry standard is Adobe Photoshop and Illustrator for creating graphics; however, these programs are relatively expensive for personal use and have a steep learning curve due to the many advanced features they offer. For someone on a budget who doesn't need (or want to learn) the advanced features offered by Adobe, there are a few free graphics editors out there that work quite well, such as The Gimp, Paint.net, and Pixia. While graphic design software comes in many shapes and sizes, they generally share some common components.

The workspace

The workspace is the interface of the graphic design program. It can include the canvas, panels, tools, and file menu. Some programs like Adobe Photoshop offer the ability customize the workspace to only show select components. Workspaces for multiple projects can be saved.

The canvas

The canvas is the area where the designer interacts with objects, using tools from the tool panel. Images can be important to the canvas and edited, or custom shapes and graphics can be created and then saved as a new image. Graphic design software canvases usually allows layers, letting designers stack different images and shapes on top of each other to keep things organized and create different effects.

Tools

Designers use tools to manipulate the objects on the canvas. Common tools include shape drawing tools, paintbrushes, and croppers. Many tools are controlled by panels, which offer the ability to change the attributes of tools. For instance, a typography tool might have a panel that controls the font, size, and color of the typography.

Color modes

While working in a graphics editor, designers will probably come across different color modes. The ones we are concerned with for computer graphics are RGB (red, green, blue) and CMYK (Cyan, Magenta, Yellow, Key Black). The main difference between the two lies in how they are compiled. RGB is additive while CMYK is subtractive. Take a look at the examples below. The CMYK example shows all colors adding up to white in the middle, while CMYK shows all of the colors subtracting until there is nothing left but black.

So which of these is best to use for web projects? Consider how a computer monitor displays color. Monitors emit light, whereas inked paper absorbs or reflects specific wavelengths. Cyan, magenta, and yellow pigments serve as filters, subtracting varying degrees of red, green, and blue from white light to produce a selective gamut of spectral colors. Like monitors, printing inks also produce a color gamut that is only a subset of the visible spectrum; although, the range is not the same for both. Consequently, the same art displayed on a computer monitor may not match to that printed in a publication. Also, because printing processes such as offset lithography use CMYK inks, digital art must be converted to CMYK color for print. Conversely, true CMYK cannot be viewed on a computer monitor because screens add light to create their colors. Use RBG for web projects.

Vector vs. raster images

Digital graphics come in two basic types: vector and raster. Vector images retain all of the mathematical expressions that were used to design their appearance, while raster images do not. As a result, vector images can be resized to large proportions without compromising definition because the computer is constantly recalculating the angles that make up the graphic. A raster image, when blown up however, begins to pixelate and loses definition because it is unable to recalculate the image information.

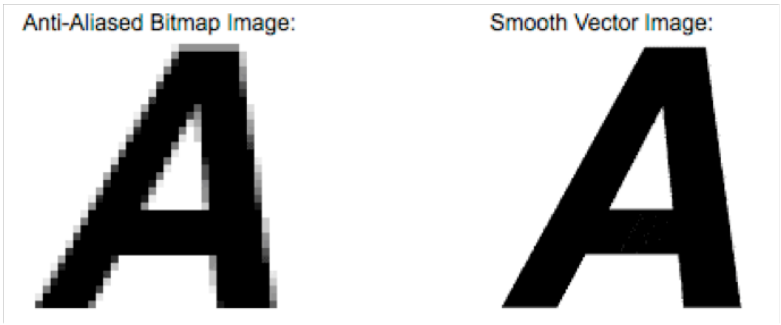
Despite this seeming disadvantage, depending on resolution of the image, some raster images can be enlarged to very large sizes. For instance, if a digital photograph was taken at a very high resolution, the picture can be enlarged bigger than one taken with a small resolution camera.

Resolution refers to the number of pixels per inch (PPI) or dots per inch (DPI) in the image. A higher resolution produces a greater number of pixels, allowing for a greater gradation of color that will translate better as the image is enlarged. The more pixels an image has, the more individual points of data to be stored, as well. For this reason, resolution is directly related to file size. For high-quality photography, a high DPI is preferred because the images will look more appealing to the viewer. For small images which do not need to be blown up, or when quality is not important, a low DPI can be used.

Vector graphics use geometrical primitives such as points, lines, curves, and shapes to represent images in computer graphics. Vector graphics are made up of vectors (also called paths, or strokes), which lead through locations called control points. Each of these points has a position on an x- and y-axis. Points can contain information such as direction of the vector (which is what defines the direction of the track), color, shape, thickness and fill. It's important to note that the number of attributes assigned to points do not affect its size as much as the number of points contained within the art.

Computer screens and printers are raster devices, so vector graphics need to be converted to raster format before they can be displayed or printed. This may seem misleading, because designers can create vector graphics using a computer screen, but keep in mind that how the designer sees the graphics on a screen depends on how large the resolution of that screen is. The size of the raster file generated by the conversion will depend on the resolution required, but the size of the vector file generating the raster file will always

remain the same. Because of this, it is easy to convert from a vector file to a raster file format but it is much more difficult to go in the opposite direction, especially if editing of the vector picture is required. For this reason, designers will usually keep a master vector file for editing and export raster versions of the file for computer graphics where needed.



Web Image Formats

The file format chosen for web images affects how the website appears and how fast the page loads. There are three image formats in constant use on the net: GIF, JPG, and PNG. Each is suited to a specific type of image, and matching an image to the correct format should result in a great-looking, fast-loading graphic. For a professional quality look, when choosing the format for an image, always be conscious of both the image's quality and filesize.

Graphics Interchange Format (.GIF)

The 8-bit GIF format has long been a popular image format on the Internet, due largely to its small file size. GIF files can be saved with a maximum of 256 colors, making it a poor format for photographic images that may require thousands of colors to appear accurately. It is ideal for less-complex graphics like small navigational icons and simple diagrams or graphics with large blocks of a single color. GIFs use a simple technique called LZW compression to reduce the file sizes of images by finding repeated patterns of pixels.

Because of their color restrictions, GIFs have the option to dither, or in other words, mix pixels of two different available colors to create a suggestion of another color. GIFs can be animated, and because of their small file sizes, many

of the animated avatars or moving icons you see are GIFs. Remember the dancing baby back in the 1990's? That was a GIF. GIFs also allow single-bit transparency, which lets designers specify one color in the image to be transparent, which makes it possible for the background colors of the web page to show through the image.

GIFs can also be interlaced, which is a way of saving a graphic so that it loads progressively as it is downloaded. At first a blurry, low-detail version is loaded, and then successive layers of detail are added as more bandwidth becomes available. Interlacing usually contributes to a larger overall file size, but it means that a version of the image gets placed onto the viewer's screen much quicker, making it beneficial in many situations, as it gives the impression of a speedier download.

Joint Photographic Experts Group (.JPG)

The 16-bit JPEG format (the extension is usually written as .jpg), was designed with photographs in mind. It is capable of displaying millions of colors at once, without the need for dithering, allowing for the complex blend of hues that occur in photographic images.

JPGs use a complex compression algorithm that can be applied on a sliding scale. Compression is achieved by 'forgetting' certain details about the image, which the JPG will then try to fill in later when it is being displayed. You can save a JPG with 0% compression for a perfect image with a large file size, or with 80% compression for a small but noticeably degraded image. In practical use, a compression setting of about 60% will result in the optimum balance of quality and file size, without letting the lossy compression do too much damage. Though JPGs can be interlaced, they lack many of the other special abilities of GIFs, like animation and transparency.

Portable Network Graphics (.PNG)

PNG is a format invented specifically for the web in response to a licensing issue that forced the creators of any software that supported the GIF format to pay $5,000. In terms of quality and capabilities, the PNG is superior to GIF in almost every way. There are two versions of the PNG format, PNG-8 and PNG-24. PNG-8, is similar to the GIF format, as it can be saved with a maximum of 256 colors and supports 1-bit transparency. File sizes are noticeably

smaller using PNG-8 rather than the GIF counterpart, because PNGs save their color data more efficiently. PNG-24 offers 24-bit color support, allowing large ranges of color similar to a JPG. PNG-24 is in no way a replacement format for JPG, however, because it is a “lossless” compression format. This means that file sizes using PNG can be significantly larger than a comparable JPG.

PNG’s main draw is its alpha-channels. Instead of the rudimentary transparency options in other formats (where a pixel is either transparent or opaque), an alpha channel can specify the opacity of any pixel from 0 to 255, where 0 is fully transparent and 255 is fully opaque. This allows designers to create a graphic that can be placed on top of any background color and will retain a translucent effect, with the background showing through the pixels that are not opaque.

Browsers have not always had support for semi-transparent images but most modern browsers support this feature now. Being able to use semi-transparent images opened up a new world that allowed designers to break out of the box of square images.

Including images in your HTML

Once images have been saved in the appropriate format, they’ll need to be embedded in the HTM using either HTML tags or CSS references. Images can be added to the web either as a document element by using the inline <img/> tag or by using CSS. CSS is usually used for background images and bullets, while an inline image is usually used for focal pictures, such as a picture of a member of a company’s corporate team or a profile picture.

Image Optimization

While scripts and style sheets add load time to a web page, images account for over 50% of the total page size and usually constitute the largest single component that needs to be loaded. Optimizing your images for fast download can make a material impact on a page’s load time by reducing the download size per page.

Lossless image compression

Lossless image compression is the process of removing metadata and excess information, and possibly rearranging the data, without impacting the image quality. When a designer creates a design using imaging software like Photoshop, the resulting image file carries all sort of metadata about dates and edits. This metadata makes editing simple, but creates a lot of unnecessary weight. When the page is served up on the web, this data isn't needed and sending it sends users a lot of wasted bytes they'll never use.

Lossy Image Compression

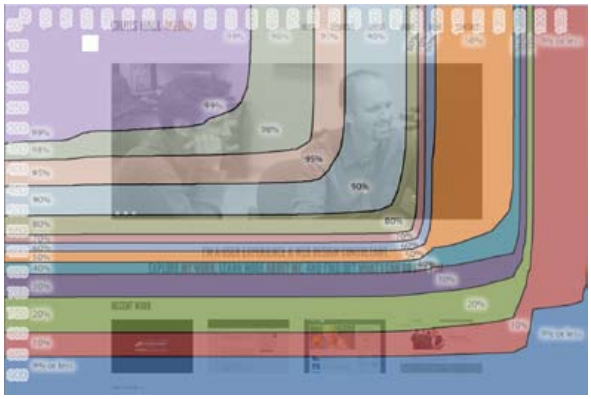
Lossy image compression attempts to reduce the image to match screen quality. While lossless image compression eliminates excess data from an image, it does not affect the resolution of the image itself. It's possible that the compressed image may still be of higher quality and size than users can take advantage of on the web. Consider an image takem at 10 megapixels, which most phone cameras can do today. A monitor displaying a 1024×768 resolution shows less than 1 megapixel of data. Even a full HD resolution of 1920×1080 is only about 2 megapixels. So, if you take a picture and post it on the web, you're sending 5–10 times more data than the users need. Using lossy compression will drastically reduce raw image size with no visible impact to the user on screen.

Image formats and compression

As we discussed briefly in the section on image formats, choosing the right image format can save significant bytes. Even within a format, different encodings may impact the result. For example, JPGs can be saved as "progressive" or "baseline" and each are more efficient in different scenarios. In general, GIF files are usually the smallest because of their limited capacity for colors, JPG offer a fairly wide range of quality and size options, and PNGs are the largest because of their increased capacity. The most effective way to optimize images based on format is choosing the right format for the right images. For instance, if the graphic is small and does not require transparency, a GIF will be the best choice, because it has a smaller file size and doesn't need to be detailed. Some header graphics need to be high quality and support transparency, even if it means having a larger files size.

Load images on-demand

No matter how well images are optimized, there are almost always going to be images that load beneath the users initial viewing area on the website. This adds wasted time to the page download, especially if the user never scrolls to see the images that were loading. In fact, most websites have "below-the-fold" content that is never actually viewed. Using Google's free browsersize application (http://browsersize.googlelabs.com/), it's actually possible to see how far typical visitors to a given site scroll down. Armed with this information, it's possible alleviate the problem of loading images that viewers will never see by downloading the images on-demand. Images that are "above the fold" will be loaded right away, while images below the fold would only be loaded when they scroll into view. If web pages auto-refresh, or if users use low-resolution screens (or mobile screens), the impact of waiting to download images until the user scrolls down will be even greater. The page will load faster thanks to the reduced download, and the site's bandwidth costs will see a significant drop. On-demand image loading can be done using some simple JavaScript.



CSS sprites

One way to optimize images is by using several images in one. Every time the browser loads an image on the page, it has to make an HTTP request. The number of these requests can contribute to the load time of a page. CSS sprites allow several images to be combined into one (think of a roll of film, with different picture all on the same reel). In the example of the Apple computer website shown to the left, a designer used one image for each of the different buttons in the site navigation

as well as their different states. In doing so, the page is only required to make one HTTP request instead of 25. When using a sprite, the browser downloads the entire image once, and unique coordinates specify which part of that large image to show. This way the whole image is only downloaded once, and can significantly save load time, especially when done with many images.

Web Multimedia

Video is one of the most powerful mediums available on the Internet. The availability of video online has turned ordinary people into media outlets and turned large media outlets into ordinary content providers. It has changed how wars are covered. It has contributed to the fall of politicians and the rise of democracies. While online video is widespread today, its prevalence is relatively recent. In the early days of the Internet, online video was scarce due to constraints such as the lack of available digital recording equipment, compression limitations and inadequate connection speeds. Over time, digital recording and deployment technology has improved, bandwidth has increased, and video-streaming technology has advanced. Users with Internet-enabled smartphones are able to quickly record video from their phone, upload it to a server, and deploy it to their audience in a matter of minutes. Web video conferencing software, such as Skype and Face-time, allows users to share a live video feed with other users. Video is a key component of Internet communication because it allows us to connect with each other in a personal, visual way. Communication professionals should understand how web video works and how to take advantage of it.

Planning a web video

Understanding the process used by professional producers can help anyone improve the quality of the videos they produce, and make a difference in the "watchability" of the content. Large studios with big budgets have the resources to spend copious amounts of time and money on developing videos; however, by taking a little bit of time to plan a video, the quality improvement can be surprising. Usually, a video will begin as a simple idea. It may be an interesting visual way to describe some elusive metaphor or illustrate a concept. The visual elements may be as simple as a single talking-head narrative, or as complicated as a Pixar-style 3D CGI animation.

The first step of realizing a video is to get the idea to materialize on paper. The best way to do this is with a simple script. A script does not need to be literal; in fact, it can be fairly vague in the beginning. Producers will generally begin writing a script by making a table in a document with three columns: Audio (what the viewer is hearing), video (what the viewer is seeing), and the time code for each segment (how long it should take). These things are sometimes labeled VO and GFX for voiceover and graphics. The script allows the producer to walk through the video and decide what each second of the video will look like. Once this has been done, the producer will usually take the next step in visualizing the video by creating a storyboard. Take a look at this example for a 30-second advertisement:

time	Audio	GFX
	MUSIC: Techy, fast paced music for entire segment SFX: Big swoosh going into the machine	TEXT: So what's INSIDE the New Income Maximizer? VIDEO: Zoom towards Income Maximizer machine, door opens up and it looks like we're going in
00:05	SFX: Big Boom when "Upgraded" banner slams down, computer noises when the features are appearing	TEXT: eCards with an "UPGRADED" banner slamming down on top of it TEXT: Hi-Tech numbers turn into letters spelling out a couple of new features VIDEO: Screenshots sliding in and out of hi-tech video screens
00:10	SFX: Big Boom when "Upgraded" banner slams down, computer noises when the features are appearing	TEXT: Media Center with an "UPGRADED" slamming down on top of it TEXT: Hi-Tech numbers turn into letters spelling out a couple of new features VIDEO: Screenshots sliding in and out of hi-tech video screens

00:20	SFX: Big Boom when "Upgraded" banner slams down, computer noises when the features are appearing	TEXT: Follow up Assistant with a "NEW" banner slamming down on top of it TEXT: Hi-Tech numbers turn into letters spelling out a couple of new features VIDEO: Screenshots sliding in and out of hi-tech video screens
00:25	SFX: Big swoosh going out of the machine	TEXT: All available when you get INCOME MAXIMIZER VIDEO: Zoom out of the income maximizer

Technical requirements for video

The technical process of putting a video up on the web usually begins with shooting the video with a digital camera, compressing it to a web-friendly format, putting it on a streaming server, and embedding it in a web page using an appropriate video player. Web video plays in a browser using one of a few different streaming protocols—Real Time Messaging Protocol (RTMP) and Real Time Streaming Protocol (RTSP) are a couple. These protocols allow for multimedia communication that is not available in HTTP, such as adaptive bitrate streaming, a feature that constantly checks a user's bandwidth as a video is playing. If bandwith drops while the video is playing, an adaptive bitrate will change the bitrate of the video that is streaming to accommodate the user's bandwidth. It is common to have server software that communicates this way, which is referred to as a streaming server.

Video compression

Similar to images, size matters in web video. Even though bandwidth has improved greatly and streaming technology has improved, the size (number of kilobytes or megabytes) of a video will have a marked impact on the viewer's experience. Video compression is a process by which an editor tries to get the maximum quality from a video while maintaining the smallest possible size.

When considering compression, it is important to discuss format. Web browsers support a limited number of video formats, and it is important to know which ones work best in different situations. In the past, the ideal format for delivering web video was the proprietary Adobe flash .flv format. This codec was created specifically to be played through the Adobe Flash player plugin, and for years nearly all web video was delivered in this format. Recently, however, as browsers have started moving away from proprietary formats and to more open platforms, the

.mp4 (H.264) mpeg format has gained traction. Most of their popularity is due to their open source licensing.

Video vs. animations

It is also important to understand the difference between online video and animations. Both are essentially movement on the screen; however, they are created in different ways. Web animations can be created using a variety of tools, including Adobe Flash (plays in the Flash player), HTML5 canvas animation technology, JavaScript, or even the latest version of CSS. While the HTML5 canvas and CSS animations have only recently become popular, Flash has been widespread on the Internet for more than a decade. Flash is a proprietary browser technology that allows developers to use an interface that combines a graphics editor, a timeline-based animation tool, and a version of ECMAscript called "actionscript" to create a vast menagerie of different web tools. Flash could be used to create a simple web animation or a technically complex video player. Flash exports the object into a swf file that can be embedded on a web page. Most video on the web is still played through Adobe's Flash player

While these animations require some sort of technology to play in the browser, they do not require a separate object to be played through, as is the case with video. Video is played back through a video player, so the difference between video and animation is generally fairly obvious because videos will have player controls underneath it. However, HTML5 supports a video tag that allows certain video formats to be played in the browser without the assistance of the Flash player. Animations are usually much smaller files than video and do not require streaming server technology like video does.

The future of web video and Flash

As I mentioned, HTML5 is the next generation of the HTML standard, and it includes new support for embedded multimedia, including video, audio, and animations. It's also important to understand that at the time pf publication, HTML5 video playback is not supported by all browsers and is not considered standard. Luckily, Flash can play H.264 video, which is the same format supported in an HTML5-capable browser. This makes it easy to provide the same video to people who might be using HTML or Flash. It is a good practice to configure a player so that the greatest number of people can see a video using one or the other platform. Currently, it

makes more sense to have Flash as the default player with an HTML5 fallback to get the benefits of Flash that HTML5 video can't yet match.

HTML5 embedded multimedia is still a few years from adoption. It still lacks some feature that users have gotten used to, such as adaptive bitrate streaming (HTML5 video can perform one bandwidth check prior to beginning streaming, to test the viewer's bandwidth and serve the appropriate stream, but it can't monitor the connection once streaming has begun). So, it's best to create different versions for different bitrates. It is also not possible to support digital rights management. The truth is that one of the main reasons HTML5 multimedia has gotten so much traction is because Apple's mobile devices don't run Flash. If it weren't for that, there wouldn't yet be much interest in HTML5 video. It becomes important, however, because it's the only way to reach iOS (iPhone/iPad software) users who are attractive to content providers and advertisers.

Sources

http://www.brighthub.com/multimedia/photography/articles/31930.aspx (image)
http://browsersize.googlelabs.com/ (image)
http://www.apple.com/ (image)
youtube.com (image)

Terminology Review

- RGB—Red, Green, Blue color mode; additive.
- CMYK—Cyan, Magenta, Yellow, and Key Black color mode; subtractive.
- Vector image—An image that maintains its mathematical expressions.
- Raster image—A bitmap that does not maintain any mathematical expressions.
- GIF—Graphics Interchange Format.
- JPG (JPEG)—Joint Photographs Experts Group.
- PNG—Portable Network Graphic.
- Lossless image compression—Compression that strips metadata from an image.
- Lossy image compression—Compression that modifies the resolution of an image.
- CSS sprites—Technology that allows designers to specify which areas of an image appear in the browser.
- Streaming server—Software that allows multimedia transfer over the network.

- Web video—Motions graphics that are compressed in a video format and play through a video player.
- Web animation—Motion graphics that play directly in the browser or using a plugin like Flash player.

Chapter XIII

ANALYTICS

Web analytics measure Internet data in order to help communications professionals understand user behavior and accomplish goals. You may be thinking, "Isn't all that numbers stuff for marketers? I'm a designer, programmer, writer, etc…." Well, analytics have come a long way since the ubiquitous hit counters of the 1990's. While there are many metrics that appeal mostly to marketers, such as conversion rates and key performance indicators, analytic software is also providing some great information to help facilitate a more scientific approach to user interface design. Using tools like Google Optimizer, designers can test prototype interfaces out in the wild and get real user data on which user experience accomplishes their goals the best.

The $600 million web analytics market (Stanhope, 2011) is dominated by a relatively small group of companies, including Omniture, VisiStat, and Coremetrics. The interesting thing about this is that 43% of the market (Hamel, 2011) is dominated by a free service: Google Analytics. While Google Analytics does not offer some of the more personalized services required by more mature organizations, its toolset caters to the vast majority of companies. Given its dominant market share, chances are that every communications professional will be exposed to Google Analytics (GA) at some point, so we will refer to the tools offered by GA in this chapter. However, no matter what software is use to measure, there are some key terms that need to be understood.

Standard Metrics

Visitors

The number of visits to a website is usually tracked in two different ways: visitors and unique visitors. The number of visitors refers to the total number of times the page was accessed. Unique visitors are the number of unique IP addresses that visited a site. This is an important distinction because it enables organizations to identify the total number people going to their site and compare it to the number of repeat visitors.

Traffic sources

Identifying where a site's visitors came from can be very insightful. The traffic sources can help decision makers understand what is working in their advertising efforts and offer suggestions as to how people search for your products. Traffic sources to generally be concerned with are:

Search Engine Traffic: Visitors who come to a site from search engines are important because they represent how and why people are looking for the company. Knowing what searches people used to find a site in a typical search can reveal what keywords to use in search engine pay-per-click campaigns such as Google Adwords.

Direct Traffic: Direct traffic can come from someone who has bookmarked a page and jumps directly to it, or from someone who types in the URL directly into the browser. The grey area to remember with direct visits is that it's still possible for someone to go to a site directly from an advertisement. Even though traditional banner ads have links that take people to a site, it is possible for people to see a non-web ad like a billboard and then type the URL into the address bar directly, causing the number to be a little misleading. One way marketers get around this is by advertising unique URLs with varying marketing campaigns. For instance, if SUU were running a billboard campaign, they might include the URL www.suu.edu/billboard.

Referred Visitors: These are visitors coming to a site from a link on another site. If I wrote a blog post for www.uxmag.com and the byline had my name and website URL in it, people who read my post and clicked on my link would be referred visitors. Most analytics offer ways to see the top contributing referring sites to identify where the bulk of site traffic is coming from and what is most effective. It can also be important to know where in a site a visitor came from. For instance, it's possible to tag a link with a special code so we can track specific visits from that link. This could come in handy in these situations:

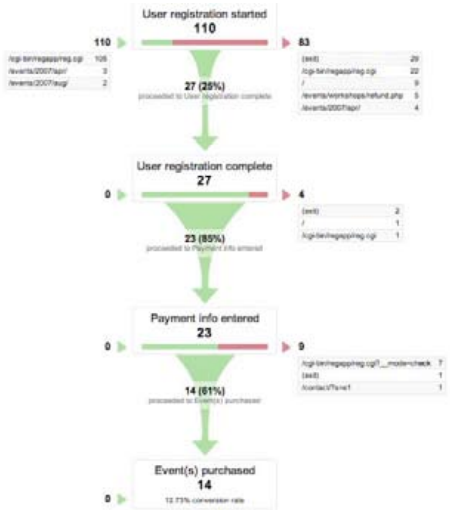
- Image search: Big search engines like Google and Yahoo have made it easy to do more segmented searches, such as image or product searchers. If images are tagged and the files are named in a descriptive manner, it can help lead people to the site.
- Web directory listings: Depending on the type of business, consumer directories (i.e., YellowPages.com, Yelp.com, etc.) may result in a substantial number of visitors.
- Social networks: Twitter, Facebook, and social bookmarking sites like Digg, StumbleUpon, and Reddit can send traffic to a site if they are used correctly.

Goals and Conversions

Goal conversions are the primary metric for measuring how well a site fulfills business objectives. A goal conversion is registered once a visitor completes a desired action on the site, such as registering for membership or purchasing a product.

Conversion funnels

Once a user lands on a website, there is inevitably a process that they will go through to end up at the desired goal. For instance, I worked on an application that gave users an online health assessment. Our goal was to get people through the assessment, because at they end they were prompted to purchase our products. We wanted to see where people were dropping off in the application so we could eliminate trouble areas and boost completion rates. By using analytics, we were able to find that we had a huge drop-off rate right after the first page. After further inquiry, we realized that one of the big reasons for the drop off was that on the second page a progress bar appeared that gave the first glimpse into how long the questionnaire was going to take. The way the bar was presented made it look like it would take a long time to complete. Analytics helped us pinpoint this problem quickly.



Key performance indicators

A key performance indicator is a metric that measures current performance in relationship to business objectives. Key performance indicators are based on goals and can be any number of metrics that allow a comparison of performance against the goal. It can also be a ratio, such as dollars spent on advertising vs. the number of resulting purchases on a website.

Profiles

Profiles show traffic reports for specific websites (if there happens to be more than one), subdomains of a website (such as projects.chrishallmedia.com), specific areas of a site, or for specific kinds of traffic, such as advertising referrals to a website. Each profile represents a distinct view of data for a single web site.

Filters

Filters are a simple way to make sure only the desired data is delivered. They also make it easy to segment data and pinpoint behavior, and they can help ensure the accuracy of the findings. Two common filters exclude personal and employees' IP addresses from results. This is important because when a corporate team is working on a website, they'll visit it many times per day. If those hits show up, it can skew your data. Set up a simple filter that excludes anyone working on the website. Aside from the filtered profiles, it's always important to also have one unfiltered for comparison.

Post-click optimization

For marketers, a perfect world would be customers seeing an advertisement, clicking on it, and immediately tossing the item in their shopping cart, and checking out. Reality, unfortunately, is more complicated. It can take several visits to the site and multiple touch points before any revenue is generated from the initial advertising clicks. The problem with this roundabout path to the goal is that it can be difficult to define the real advertising cost of selling product. This is a very important number to know accurately, because if a company is spending more than the advertising is worth, they have a problem.

It's always better to rely on the math instead of guessing when making decisions about advertising cost-per-sale and true conversion rates. These data are actually fairly easy to calculate and analyze. The first step is understanding how people buy from the company and the decisions they make along the way. This will help to create the touch points that people will encounter along their path to buying. Touch points are also referred to as mini-, micro-, or intermediate-conversion events. These intermediate conversions steps do not directly generate revenue, but they help a prospective customer continue through the sales process to make a final purchase. In addition, these steps capture and track behavioral data to help

optimize these touch points.

Here is an example of the conversion process using touch points:

1. You (the advertiser) purchase pay-per-click advertising using an Adwords-type service.
2. A whitepaper with content appealing to your target market is available for download on the landing page. The customer's name and e-mail address is required to receive the whitepaper.
3. An e-mail is sent out to the people who registered to attend a free webinar. To attend the webinar, the customer must add a phone number as well as some additional data about his or her company.
4. After the webinar, a salesperson calls every customer who attended and attempts to sell him or her a product.
5. Sale is made.

Tracking each of these steps along the way is important. While it requires more effort, the additional data you receive will allow you to optimize your pay-per-clicks and get a more accurate picture of customer behavior and your true cost per conversion. If you have set up a process to track all of this data, the next step is to calculate the actual cost per conversion by charting it like this:

	Conversions	Conversion Rate from Last Conversion	Conversion Rate from Click	Cost Per Conversion
Click	1000 (clicks)	-	-	$1 (click cost)
White Paper Download	250	25%	25%	$4
Webinar Signups	175	50%	17.5%	$17.50
Webinar Attendees	100	57%	10%	$10
Phone Call Contacts	10	10%	1%	$100
Sales	2	20%	0.5%	$500

Using these basic data as your baseline, you could then test different areas of the conversion process to determine where improvements could be made, focusing on the touch points. In the example above, the first place to look would probably be the 10% contact rate in the phone contact phase. The sales team's 10% contact rate seems exceptionally low in this case. It would be smart to begin by investigating the sales contact process and see where it can be optimized. A change in the contact ratio would undoubtedly impact sales.

Sophisticated systems aren't required to build this type of tracking. Each of these metrics can be gathered using free web analytic tools and default CRM software that most companies' sales teams use. Even if each system is not integrated, by combining the information into a single spreadsheet, there will be ample data to begin optimizing not only pay-per-click processes, but entire marketing processes as well.

Google Analytics installation

Google Analytics is very simple to install. Just go to analytics.google.com, set up an account and create a profile for the site. Google Analytics will produce a few lines of JavaScript that can be copied and pasted into the website. Once the code is on the website, it can be tracked through Google Analytics in the dashboard. Some content management systems will include plugins that make it easy to implement analytics without even needing to copy and paste the code.

Usability Testing

A/B Testing

A/B testing is a simple application of the scientific method to web design. A/B testing is essentially what it sounds like: comparing two versions of something (A and B) with metrics to determine which is more effective. To make this determination, both versions are subjected to experimentation simultaneously. The version that performs the best at accomplishing the goal is implemented.

In order to have a valid experiment, it's important to put some thought into how

the experiment is structured to make sure that both iterations are being considered on a level playing field. Typically, A is the existing design (or the control group), and B is the new design. The test entails splitting website traffic between the two versions and measuring their performance using the selected metrics (conversion rate, sales, bounce rates, etc.). In the end, it should be apparent which version performs the best.

The first step in conducting an A/B test is determining what to test, depending on your goals. For example, think about having a goal of getting more people to sign up for a newsletter using a form on the website. The first step would be to create one or more hypotheses that suggest what keeps people from completing the sign up form. Is the form's length intimidating? Are visitors concerned about privacy? Is the copy on the page vague or misleading? To test these hypotheses, one option would be trying A/B testing on the length of the sign-up form, types of fields in the form, the display of privacy policy, and different page copy.

Some common page elements to A/B test include:

- The wording, size, color, and placement of the call to action
- Page headlines
- Product descriptions
- Form length
- Layout and style of website
- Focal images
- Amount of text on the page

Once testing elements are decided, getting a tool for measuring results is the next step. Google Website Optimizer (http://www.google.com/websiteoptimizer) is a free tool similar to Google Analytics that offers some pretty great data for testing. The variables on which experiments can be conducted through Google Website Optimizer are innumerable. Tests can be run on many variables, such as changing the page background color, testing different ad copy, different images, different headlines, different positioning, and different layouts and designs to the combination of size and location buttons, trust logos, affiliation links, etc. Aside from Google Optimizer, most A/B testing software has the same components:

Testing an element

As an example, if you wanted to test a single element on the page, for instance,

a “buy now” button that was green and one that was blue, you would create the HTML for both versions and copy them into the A/B testing tool. The tool would then show a different button to each user randomly until the quota had been filled.

Testing a page

Testing an entire page works pretty much the same way. In this case though, you would create an alternate page on your website that was not linked to from anywhere on the site (so people couldn’t access it accidentally) and then provide the A/B testing tool with both URLs. For example, if your home page is http://www.chrishallmedia.com/index.html, then you’ll need to create a variation located at http://www.chrishallmedia.com/index1.html. When the test runs, your tool will redirect some visitors to your alternate URL.

Once the experiment is set up in the testing tool a conversion goal is needed. Conversions are measured by whether a user accomplishes the goal. For instance, if you have an e-commerce store and you are testing the color of the “buy now” button, then your conversion goal would be the confirmation page that is displayed to visitors after they complete a purchase. As soon as a conversion event occurs on your website, the A/B testing tool records the variation that was shown to the visitor. After a sufficient number of visitors and conversions, you can check the results to find out which “buy now” variation drove the most conversions.

The results of an experiment mean nothing if they are not valid. They need to be able to stand up to scrutiny. For scientifically valid results, it’s important to keep a few things in mind:

- It is very important that the two versions be tested in as similar an environment as possible. This means being tested during the same time period. If the experiments are run at different times, all kinds of social and cultural and economic influences could be different.
- Keep statistical confidence in mind. There are formulas for determining what the level of confidence is in the results of an experiment and whether the finding is statistically significant. In general, a large group of data is needed for calculating real statistical confidence. Most A/B testing tools report statistical confidence, but if the web team is testing manually, consider accounting for it with an online calculator like the one at http://visualwebsiteoptimizer.com/ab-split-significance-calculator/.

- Try not to cause the support team any major headaches. If testing a major part of the site that users interact with regularly, it might be a good idea to test against a small population over time so it doesn't throw everyone off.

Heat Maps

One of the best ways to see how users are interacting with a website is through heat maps. A heat map is a visual representation of what users are doing on a site. Heat maps, at a basic level, show where users have clicked on a page by color coding, usually with red and yellow indicating high traffic areas and blue and green areas indicating lower traffic areas. More advanced heat maps can display things like fold maps, which show how far down users scroll before they abandon the page. There are also services that show the specific number of hits on each element of the page, which is very important for conducting A/B test to know which buttons or elements are most successful. There is even the technology now to see where people click based on information like referral sources and search terms. This is extremely important because it completes a user experience loop; it shows where someone comes from and what they do on the site. If you tie these maps with other information about a user, such as demographics, it is possible to start understanding very specific things about what certain groups of people do on a website. For instance, the results may show that users under the age of 18 are not interested in certain products, while older groups are interested.

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Terminology Review

- Web analytics—The collection and analysis of Internet data.
- Metric—A specific measurement collected in web analytics such as a visitors

or unique visitors.

- Unique visitors—The number of users coming from a unique IP address.
- Conversion—When a website visitor takes the action desired by a marketer.
- Conversion funnel—The path a consumer takes to finally arrive at a sale online.
- Key performance indicator—A metric used to evaluate the success of a company's progress towards its goals.
- Cost-per-click—The amount paid for each click in a pay-per-click internet marketing campaign.
- A/B test—A test that compares a control sample to a variety of single-variable test samples to determine which one best accomplishes goals.
- Heat map—A visual representation of the places users click on a website.


THE THREE LAYERS OF WEB DESIGN
REGISTERING A DOMAIN NAME
CONDUCTING FOCUS GROUPS
CONTENT
MANAGEMENT
VOICE & TONE
PRIMARY AND SECONDARY
MODELS
COMPOSITION
ACCESSIBILITY USABILITY FINDABILITY

Appendix 2: ACRL Standards

Standards, Performance Indicators, and Outcomes

Standard One

The information literate student determines the nature and extent of the information needed.

Performance Indicators:

1. The information literate student defines and articulates the need for information.

   Outcomes Include:

   a. Confers with instructors and participates in class discussions, peer workgroups, and electronic discussions to identify a research topic, or other information need
   b. Develops a thesis statement and formulates questions based on the information need
   c. Explores general information sources to increase familiarity with the topic
   d. Defines or modifies the information need to achieve a manageable focus
   e. Identifies key concepts and terms that describe the information need
   f. Recognizes that existing information can be combined with original thought, experimentation, and/or analysis to produce new information

2. The information literate student identifies a variety of types and formats of potential sources for information. Outcomes Include:

   a. Knows how information is formally and informally produced, organized, and disseminated
   b. Recognizes that knowledge can be organized into disciplines that influence the way information is accessed

c. Identifies the value and differences of potential resources in a variety of formats (e.g., multimedia, database, website, data set, audio/visual, book)
d. Identifies the purpose and audience of potential resources (e.g., popular vs. scholarly, current vs. historical)
e. Differentiates between primary and secondary sources, recognizing how their use and importance vary with each discipline
f. Realizes that information may need to be constructed with raw data from primary sources

3. The information literate student considers the costs and benefits of acquiring the needed information. Outcomes Include:
    a. Determines the availability of needed information and makes decisions on broadening the information seeking process beyond local resources (e.g., interlibrary loan; using resources at other locations; obtaining images, videos, text, or sound)
    b. Considers the feasibility of acquiring a new language or skill (e.g., foreign or discipline-based) in order to gather needed information and to understand its context
    c. Defines a realistic overall plan and timeline to acquire the needed information
4. The information literate student reevaluates the nature and extent of the information need. Outcomes Include:
    a. Reviews the initial information need to clarify, revise, or refine the question
    b. Describes criteria used to make information decisions and choices

Standard Two

The information literate student accesses needed information effectively and efficiently.

Performance Indicators:

1. The information literate student selects the most appropriate investigative methods or information retrieval systems for accessing the needed information. Outcomes Include:
    a. Identifies appropriate investigative methods (e.g., laboratory experiment, simulation, fieldwork)
    b. Investigates benefits and applicability of various investigative methods
    c. Investigates the scope, content, and organization of information retrieval systems
    d. Selects efficient and effective approaches for accessing the information needed from the investigative method or information retrieval system
2. The information literate student constructs and implements effectively-designed search strategies. Outcomes Include:
    a. Develops a research plan appropriate to the investigative method
    b. Identifies keywords, synonyms and related terms for the information needed
    c. Selects controlled vocabulary specific to the discipline or information retrieval source
    d. Constructs a search strategy using appropriate commands for the information retrieval system selected (e.g., Boolean operators, truncation, and proximity for search engines; internal organizers such as indexes for books)
    e. Implements the search strategy in various information retrieval systems using different user interfaces and search engines, with different command languages, protocols, and search parameters
    f. Implements the search using investigative protocols appropriate to the discipline

3. The information literate student retrieves information online or in person using a variety of methods. Outcomes Include:
    a. Uses various search systems to retrieve information in a variety of formats
    b. Uses various classification schemes and other systems (e.g., call number systems or indexes) to locate information resources within the library or to identify specific sites for physical exploration
    c. Uses specialized online or in person services available at the institution to retrieve information needed (e.g., interlibrary loan/document delivery, professional associations, institutional research offices, community resources, experts and practitioners)
    d. Uses surveys, letters, interviews, and other forms of inquiry to retrieve primary information
4. The information literate student refines the search strategy if necessary. Outcomes Include:
    a. Assesses the quantity, quality, and relevance of the search results to determine whether alternative information retrieval systems or investigative methods should be utilized
    b. Identifies gaps in the information retrieved and determines if the search strategy should be revised
    c. Repeats the search using the revised strategy as necessary
5. The information literate student extracts, records, and manages the information and its sources. Outcomes Include:

a. Selects among various technologies the most appropriate one for the task of extracting the needed information (e.g., copy/paste software functions, photocopier, scanner, audio/visual equipment, or exploratory instruments)
b. Creates a system for organizing the information
c. Differentiates between the types of sources cited and understands the elements and correct syntax of a citation for a wide range of resources
d. Records all pertinent citation information for future reference
e. Uses various technologies to manage the information selected and organized

Standard Three

The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.

Performance Indicators:

1. The information literate student summarizes the main ideas to be extracted from the information gathered. Outcomes Include:
    a. Reads the text and selects main ideas
    b. Restates textual concepts in his/her own words and selects data accurately
    c. Identifies verbatim material that can be then appropriately quoted
2. The information literate student articulates and applies initial criteria for evaluating both the information and its sources. Outcomes Include:
    a. Examines and compares information from various sources in order to evaluate reliability, validity, accuracy, authority, timeliness, and point of view or bias
    b. Analyzes the structure and logic of supporting arguments or methods
    c. Recognizes prejudice, deception, or manipulation

   d. Recognizes the cultural, physical, or other context within which the information was created and understands the impact of context on interpreting the information

3. The information literate student synthesizes main ideas to construct new concepts. Outcomes Include:
   a. Recognizes interrelationships among concepts and combines them into potentially useful primary statements with supporting evidence
   b. Extends initial synthesis, when possible, at a higher level of abstraction to construct new hypotheses that may require additional information
   c. Utilizes computer and other technologies (e.g. spreadsheets, databases, multimedia, and audio or visual equipment) for studying the interaction of ideas and other phenomena
4. The information literate student compares new knowledge with prior knowledge to determine the value added, contradictions, or other unique characteristics of the information. Outcomes Include:
   a. Determines whether information satisfies the research or other information need
   b. Uses consciously selected criteria to determine whether the information contradicts or verifies information used from other sources
   c. Draws conclusions based upon information gathered
   d. Tests theories with discipline-appropriate techniques (e.g., simulators, experiments)

e. Determines probable accuracy by questioning the source of the data, the limitations of the information gathering tools or strategies, and the reasonableness of the conclusions

f. Integrates new information with previous information or knowledge

g. Selects information that provides evidence for the topic

5. The information literate student determines whether the new knowledge has an impact on the individual's value system and takes steps to reconcile differences. Outcomes Include:

a. Investigates differing viewpoints encountered in the literature

b. Determines whether to incorporate or reject viewpoints encountered

6. The information literate student validates understanding and interpretation of the information through discourse with other individuals, subject-area experts, and/or practitioners. Outcomes Include:

a. Participates in classroom and other discussions

b. Participates in class-sponsored electronic communication forums designed to encourage discourse on the topic (e.g., email, bulletin boards, chat rooms)

c. Seeks expert opinion through a variety of mechanisms (e.g., interviews, email, listservs)

7. The information literate student determines whether the initial query should be revised. Outcomes Include:

a. Determines if original information need has been satisfied or if additional information is needed

b. Reviews search strategy and incorporates additional concepts as necessary

c. Reviews information retrieval sources used and expands to include others as needed

Standard Four

The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose.

Performance Indicators:

1. The information literate student applies new and prior information to the planning and creation of a particular product or performance. Outcomes Include:
    a. Organizes the content in a manner that supports the purposes and format of the product or performance (e.g. outlines, drafts, storyboards)
    b. Articulates knowledge and skills transferred from prior experiences to planning and creating the product or performance
    c. Integrates the new and prior information, including quotations and paraphrasings, in a manner that supports the purposes of the product or performance
    d. Manipulates digital text, images, and data, as needed, transferring them from their original locations and formats to a new context
2. The information literate student revises the development process for the product or performance. Outcomes Include:
    a. Maintains a journal or log of activities related to the information seeking, evaluating, and communicating process
    b. Reflects on past successes, failures, and alternative strategies
3. The information literate student communicates the product or performance effectively to others. Outcomes Include:

a. Chooses a communication medium and format that best supports the purposes of the product or performance and the intended audience
b. Uses a range of information technology applications in creating the product or performance
c. Incorporates principles of design and communication
d. Communicates clearly and with a style that supports the purposes of the intended audience

Standard Five

The information literate student understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally.

Performance Indicators:

1. The information literate student understands many of the ethical, legal and socio-economic issues surrounding information and information technology. Outcomes Include:
    a. Identifies and discusses issues related to privacy and security in both the print and electronic environments
    b. Identifies and discusses issues related to free vs. fee-based access to information
    c. Identifies and discusses issues related to censorship and freedom of speech
    d. Demonstrates an understanding of intellectual property, copyright, and fair use of copyrighted material
2. The information literate student follows laws, regulations, institutional policies, and etiquette related to the access and use of information resources. Outcomes Include:

   a. Participates in electronic discussions following accepted practices (e.g. "Netiquette")
   b. Uses approved passwords and other forms of ID for access to information resources
   c. Complies with institutional policies on access to information resources
   d. Preserves the integrity of information resources, equipment, systems and facilities
   e. Legally obtains, stores, and disseminates text, data, images, or sounds
   f. Demonstrates an understanding of what constitutes plagiarism and does not represent work attributable to others as his/her own
   g. Demonstrates an understanding of institutional policies related to human subjects research

3. The information literate student acknowledges the use of information sources in communicating the product or performance. Outcomes Include:
   a. Selects an appropriate documentation style and uses it consistently to cite sources
   b. Posts permission granted notices, as needed, for copyrighted material