# ACS-1809-051
Web Design and Development

Chapter 1

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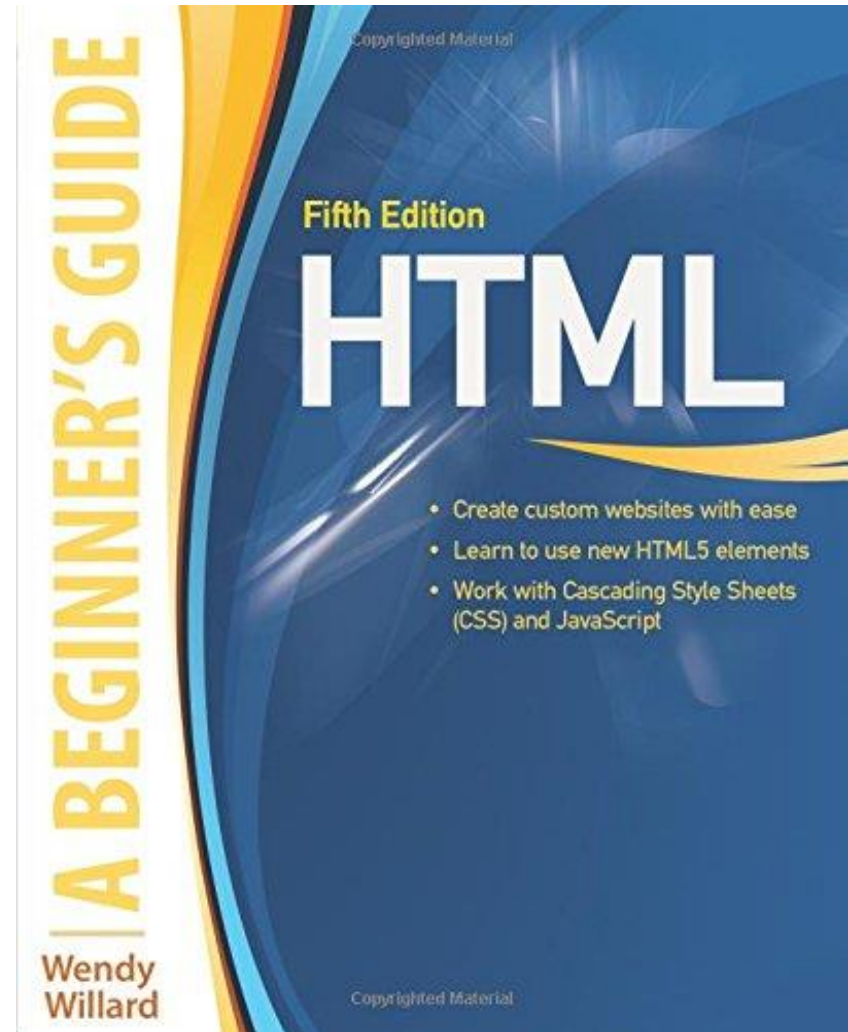
Introduction

- HTML is a means of telling a web browser how to display a page.
- Standard language for creating web pages and web applications.
- HTML is the acronym for :

Hypertext Markup language

- CSS is a means of telling a web browser how to style a page.
- A style sheet language used for describing the presentation of a document
- CSS is the acronym for :

Cascading Style Sheet

Understanding the Internet

The Internet is a medium for disseminating information:

- World Wide Web - *www*
- URLs – *Uniform Resource Locator*
- Web servers
  - A combination of compute hardware and software that that host the information for the World Wide Web
- Sites
- Pages
- Web browsers
- Internet service providers

World Wide Web

World Wide Web (www) is a network of information resources located around the world.

There are three components:

- A simple protocol to access documents on a web servers
  - ***Hypertext Transfer Protocol (HTTP)***
- A simple language for structuring documents and providing links between them
  - ***Hypertext Markup Language (HTML)***
- Browsers to access documents from web servers and present these documents to human readers
  - **A client/server system:** *your computer and the web server*
  - **Web browsers:** MS Internet Explorer, MS Edge, Mozilla Firefox, Chrome, Safari, Opera, etc.
  - **Web server:** Internet server that speaks HTTP – Apache, MS IIS, etc.

The two most important innovations leading to WWW

- **Hypertext**
- **GUI -** _**Graphical User Interface**_

Hypertext

- In 1960s, Ted Nelson described a system
  - Text on one page links to text on other pages
  - He called this system hypertext
- Douglas Englebart created the first experimental hypertext system on one of the large computers of the 1960s
- He is also the inventor of computer mouse
- And in 1991 - Tim Berners-Lee and Robert Cailliau developed the code for a hypertext server and made it available on the Internet
- They called their system of hyperlinked HTML document World Wide Web

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GUI - *Graphical User Interface*

- A way to present program output to users using pictures, icons, and other graphical elements instead of text
- To WWW, it's the Web browser: Mozilla, Netscape, IE ..
- In 1993, Mark Andreessen developed Mosaic - the first GUI program widely available for PCs that can read HTML and use hyperlinks to navigate from page to page on computers on the Internet
- In 1994, Netscape - was an instant success.
- In 1995, Microsoft created its Internet Explorer Web browser and entered the market
- Now there are serval number of Web browsers being use, e.g. Internet Explorer, Safari, Chrome, Firefox to name a few.

URL - _U_niform _R_esource _L_ocator

- The unique address to any Web document
- It contains the following information
- The type of service the resource is served by
- The Internet host name of the site containing the resource, e.g. uwinnipeg.ca
- The Internet port number of the service – HTTP standard port is 80
- The location of the resource in the directory structure of the server

URL - Uniform Resource Locator

An URL follows this format

> ***protocol://hostname/other_information***

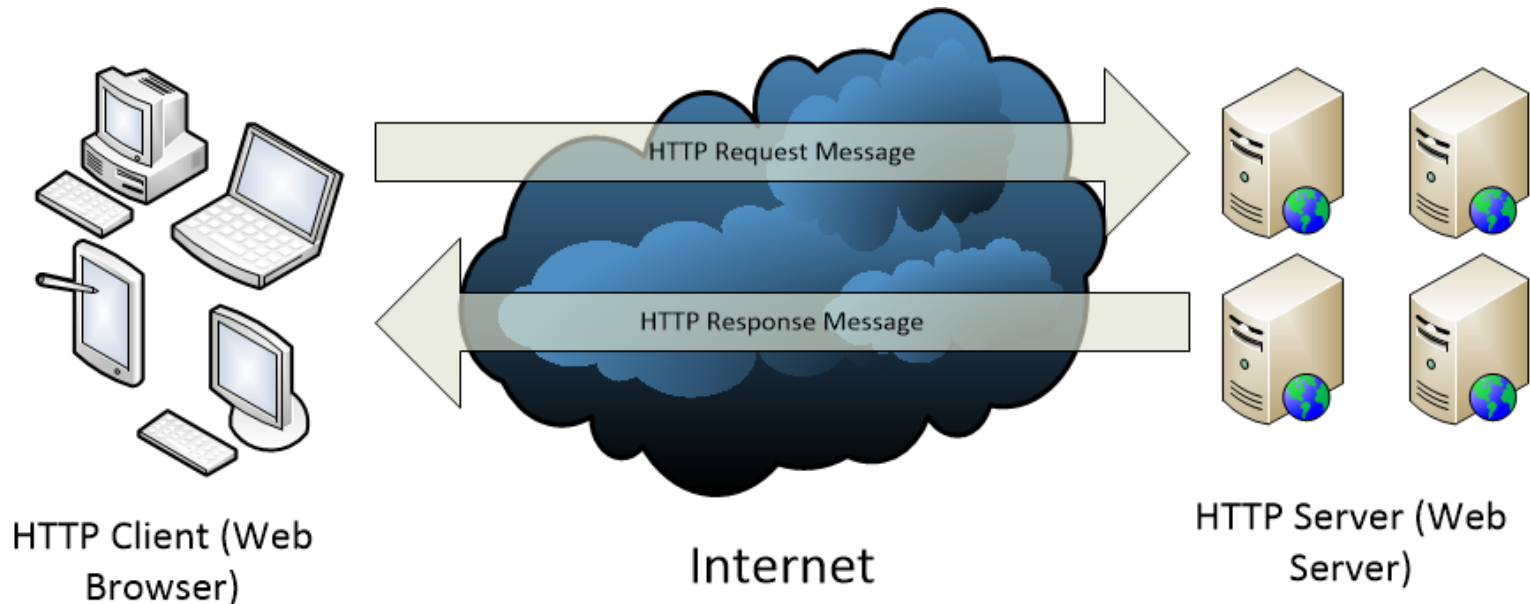Breaking down each part of an URL:
- The different protocol can be http, https, ftp and etc.
- The hostname (*domain name*) is the computer on which the resource is located and ends with *.com, .org, .edu*
- The .com, .org, .edu are what we call a root domain
- Every web site has to have an URL
- It has to be unique like your home address
- One part of a URL is the *domain name*, which helps to identify and locate computers (web server or website) on the Internet
- To avoid confusion, each domain name must be unique
  - Example: www.uofw.ca, www.ucla.edu

Domain Name System/Service

- Domain names are use for identifying Internet resources, such as computers, networks, and services
- A domain name may represent entire collections of resources or individual instances
- A domain name is easier to memorize than the actual numerical addresses (IP address) used on the Internet
- The *IP address* gives the specific address of where the site you're looking for is located on the Internet
- Computers use IP addresses, while people feel more natural to use domain names
- Domain Name System/Service (DNS) convert domain name into IP address
- Example – amazon.ca IP address is 54.239.18.172

Web Servers

- Every web site and web page also needs a web server.
  - A web server is a computer, running special software, which is always connected to the Internet.
  - When you type a URL into your web browser or click a link in a web page, you send a request using the Hyper Text Transfer Protocol (HTTP) to the server hosting that information.

HTTP Request Message

HTTP Response Message

HTTP Client (Web Browser)

Internet

HTTP Server (Web Server)

Pages
- When you visit a web site, you look at pages on the site that contain all its text, graphics, sound, and video content
- A page usually ends with ".htm" or ".html" file extention
- A default page of a particular site can be "index.html" or "home.html", which you can skip when typing the URL
- New content management system could use different fashion – like WordPress

Sites
- A site is a collection of interlinked pages
  - For a particular organization, department, or unit, …

Web Browser

A web browser is a piece of software that runs on your personal computer and enables you to view web pages.

- Web browsers, often simply called "browsers", interpret the HTML code and provide a visual layout displayed on the screen
- Browser typically can also be used to check web-based e-mail and access newsgroups
- The most popular browsers include Microsoft Internet Explorer (IE) – recent one like Microsoft Edge, Google Chrome, Mozilla Firefox
- Apple's pre-installed browser with the Mac OS X is Safari

- Most of the popular browsers are part of a breed called "Mozilla-based" browsers.
  - The name comes from the fact that each browser is based on a framework named Mozilla, which has its roots in the old Netscape browser

Web Browsers - Update

- Browsers are updated regularly, changing to address new aspects of HTML or emerging technologies
  - This means, at any given time, there may be two or three active versions of one browser on different computers, and several different versions of other browsers being employed by the general public
  - As a web developer you need to deal with this issue and create web pages that work properly on different versions of different browsers
  - Testing your web page/site on different versions of different browsers are as important as creating the web page/site

Internet Service Provider

We use an Internet Service Provider (ISP) to gain access to the Internet.

- This connection can be made through a phone line (MTS) or through a cable line with a company like Shaw.
- It can be wireless too – from Starbucks to MTS, public library, and anyone that provide Wi-Fi services.
- Some of these ISP also provide hosting service that allow you to host your web page/site (for a fee).

Hypertext Markup Language

<u>H</u>yper<u>t</u>ext <u>M</u>arkup <u>L</u>anguage (HTML)

- It is a language that describes a document's structure and content
- It is designed to specify the logical organization of a document
- The standard mark up language used on the WWW
- The text available on the WWW must be formatted according to this generally accepted standard
  - To allow web browser to read and interpret them

Hypertext Markup Language

Note that HTML it is not designed to be the language of a WYSIWYG word processor such as MS-Word
- Because the same HTML document may be viewed by many different web browsers with very different abilities
- Example: HTML allows you to mark selections of text as titles or paragraphs, and then leaves the interpretation of these marked elements up to the browser to interpret and present

HTML - All the Different Versions

- In its earliest years, HTML quickly went through much iterations, which led to lack of standardization across the Internet

- The World Wide Web Consortium (W3C – a group of Web developers (founded in 1994)) stepped in and began publishing a list of recommendations, called standards for HTML and other web languages

- Older standard - HTML 2 (November 24, 1995), HTML 3 (January 14, 1997), HTML 4 (December 18, 1997), and HTML 4.01 (May 2000)

- Last official standard (December 14, 2017) for HTML is HTML 5.2
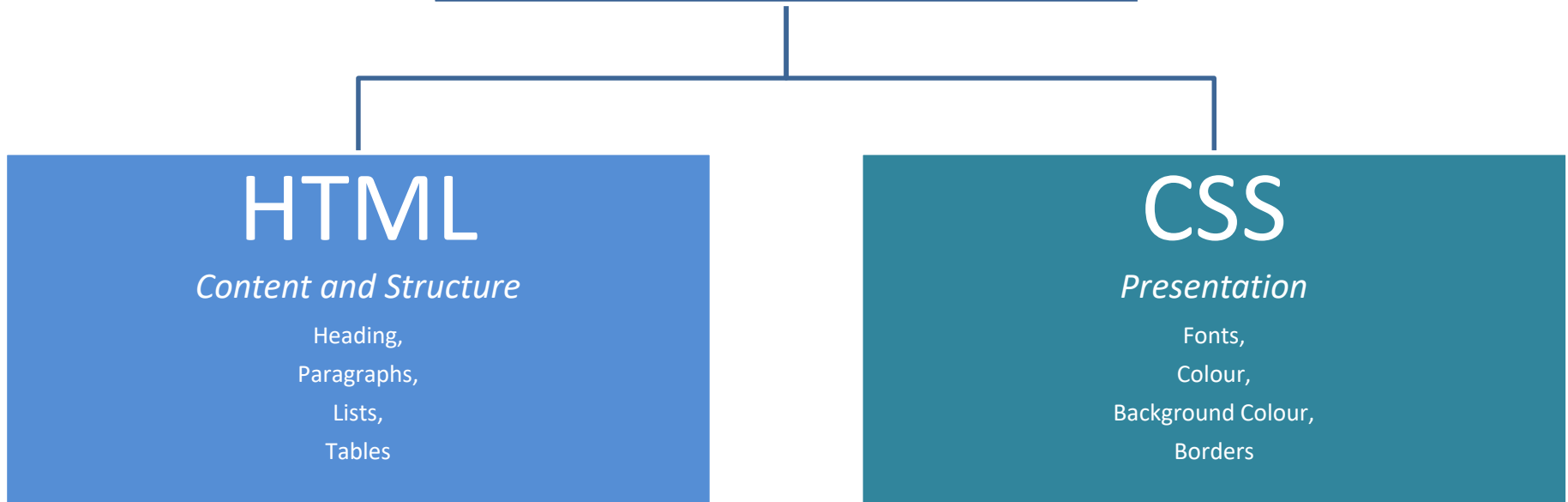
HTML 5 – Brief History

- In 2008, W3C released a working draft of HTML -- HTML5
  - To address the slow adoption of XML
  - Much capable to do almost anything a web designer wants to do, without the help of plug-ins
  - Features
  - More intuitive structure
  - Better portability
  - Next-generation forms
  - Rich media
  - Audio and Video
- On 28 October 2014, HTML5 was formally released as a W3C Recommendation
  - It is the final and complete (fifth) revision of the HTML standard
  - HTML 5.1 (November 1, 2016) was revised and published as a W3C Recommendation
  - HTML 5.2 (December 14, 2017) was revised and published as a W3C Recommendation
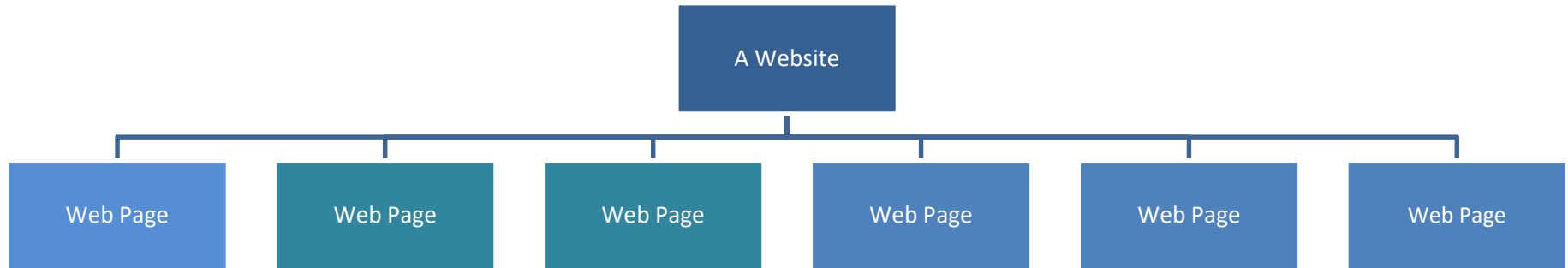
Cascading Style Sheet

Cascading Style Sheet (CSS)

- Is to enable the separation of presentation and content, including layout, colors, and fonts.
- The separation improve content accessibility and provide more flexibility and control of the presentation characteristics
- Enable multiple web pages to share formatting by specifying the relevant CSS in a separate .css file
- Reduce complexity and repetition in the structural content.
- CSS has various levels and profiles
- Each level (or version) of CSS builds upon the last, adding new features.
- Different levels are denoted as CSS 1, CSS 2, CSS 3, and CSS 4.
- We will be using CSS 3 in all our examples, assignments and project.

HTML and CSS – In a Nutshell

A Web Page

HTML
Content and Structure

Heading,

Paragraphs,

Lists,

Tables

CSS
Presentation

Fonts,

Colour,

Background Colour,

Borders

A Web Site – In a Nutshell

A diagram showing "A Website" at the top connected to six boxes labeled "Web Page" below it.

Planning and Designing a Web Site

The 5 steps process

1. Define goals
2. Plan strategy
3. Design and development
4. Test
5. Launch and maintain

Planning for Design a Web Site

1. Define goals

- The first step is to define some goals and objectives for the website
- An example of a list of questions that need to be answered before commencing the web design project:
  - What are the **objectives** of the website and what goals does it need to accomplish?
  - Who are the **target audience or users** of the website?
  - What are the **intended benefit** your website brings to the users that use it?
  - What is the **primary intent** of the website – informing, selling, getting the users to sign up for a service, or something else?
  - Is there a **competitor web**site that already operates within the same niche? What are its strengths and weaknesses?
- Answering these questions helps to gives a direction to the design project
- When defining the target audience, classify them into **distinct audience personas**. Provide value proposition and benefit that the website offers to the target audience
- May have to conduct market research and competitor analysis to determine where your website or web application fit into as a part of a wider segment

- Example: a stationary store
  - Primary goal: sell office supplies to offices
  - Secondary goal: to recruit potential employee

- Two main topic areas:
  - Shop for office supplies
  - Browse available jobs

Target audience – Example - Functions Performed

User Group	Functions Performed	Age	Gender	Web experience
Current customers	- Bank online - Contact customer service - Research additional services/products	16+	M/F	Varies
Potential customers	- Research services/products - Contact sales	16+	M/F	Varies
Potential employees	- Search job openings - Research company - Contact HR	18-60	M/F	Varies
Financial consultants	- Research services/products - View company financials - Contact sales	30-60	M/F 60/40	Savvy

Target audience – Example 2

Target Audience	Audience Goals	Content Channels	Frequency of Content Published	Content Likes	Metrics
Fortune 500 CEO's	Increase Awareness in Los Angeles and New York markets Build a Following of Fortune 500 CEOs on Twitter Convert 5 CEO Leads per month on Website Convert Leads to Paying	LinkedIn Groups Associations Twitter	2 Times Weekly	Likes to be educated, quick reads due to busy schedule, tools that help them do their job better, research and stats relevant to their space.	# of Blog Comments # of Content Downloads # of Landing Page Visits
Heads of Operations for Retail Companies	Build Brand Awareness Increase Site Referrals Build Head of Marketing Opt-In List of 100 People	YouTube LinkedIn Answers	Every 2 weeks	Likes to stay up on the latest marketing trends, niche industry marketing tips, advanced inbound marketing concepts	# of Blog Comments # of Content Downloads # of LI Profile Views

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2. **Plan strategy**

I. Development tools and technology stacks

- Analysing and selecting development tools and technology stacks for developing the website

- Example: content management system – WordPress, Drupal and etc.

II. Sitemap and wireframe

- Sitemap provides an insight into the website's information architecture

- Sitemap also helps plan a more effective website navigation.

- Wireframing provides a framework for the website's visual design and content elements and guide to the final look of the website

- Both the sitemap and wireframes are blueprint to the website that forms the building blocks of the final website.

- The wireframe and the sitemap also act as a guide to the content distribution and placement within the website.

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2. Plan strategy (cont.)

III. Content planning

- An website is all about the content, content, and content
- It is the only reason people decide to visit the website, therefore it is importance to stress for a well-planned content
- Content development has to take into account an Search Engine Optimization (SEO) strategy so that website content reaches its target audience
- A well-planned content strategy boosts search engine rankings
- Search Engine Optimization tools such as Google Analytics is a must for content creation

Developing Navigation

- You need to plan how a visitor is to navigates between each of the pages and sections.

- A good practice:

  – Include a standard navigation bar on all pages for consistency and ease of use.

  – Links to your home page and major topic areas.

  – Name of business or logo.

  – Highlight the current section on the navigation bar.

  – As many visual clues as possible.

    - Include page title, headline, page filename, etc.
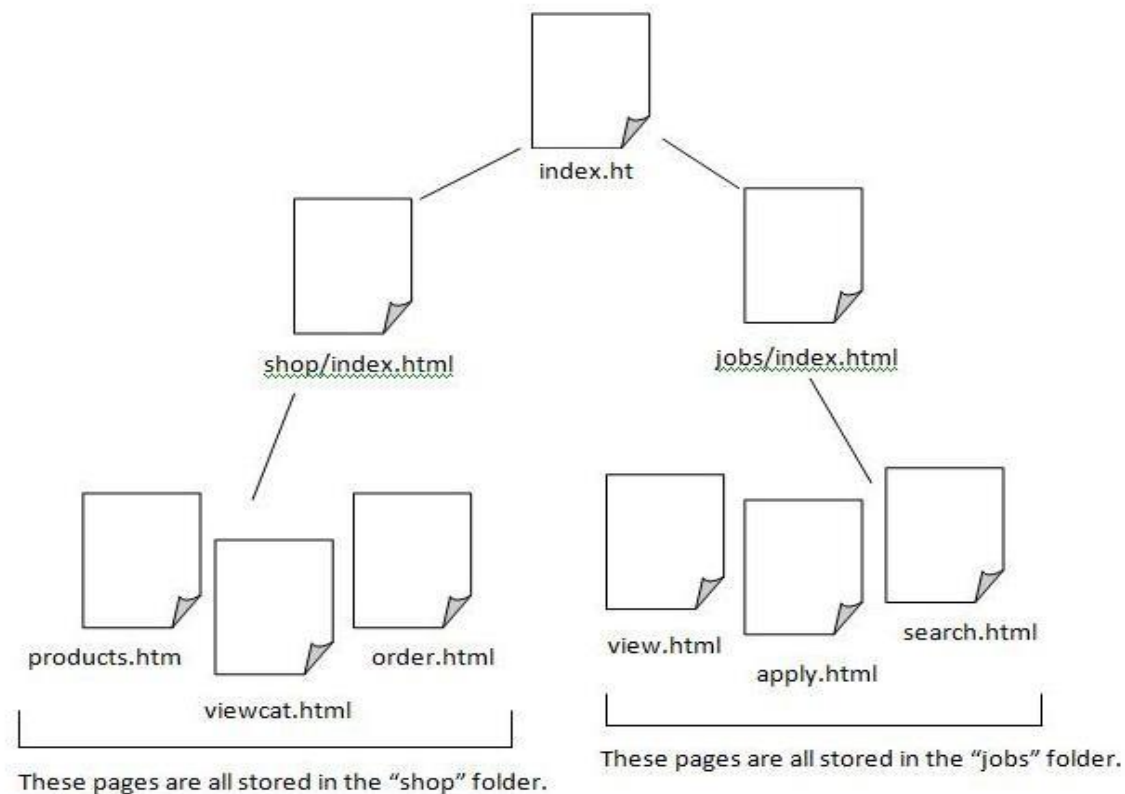
Sitemap Example 1

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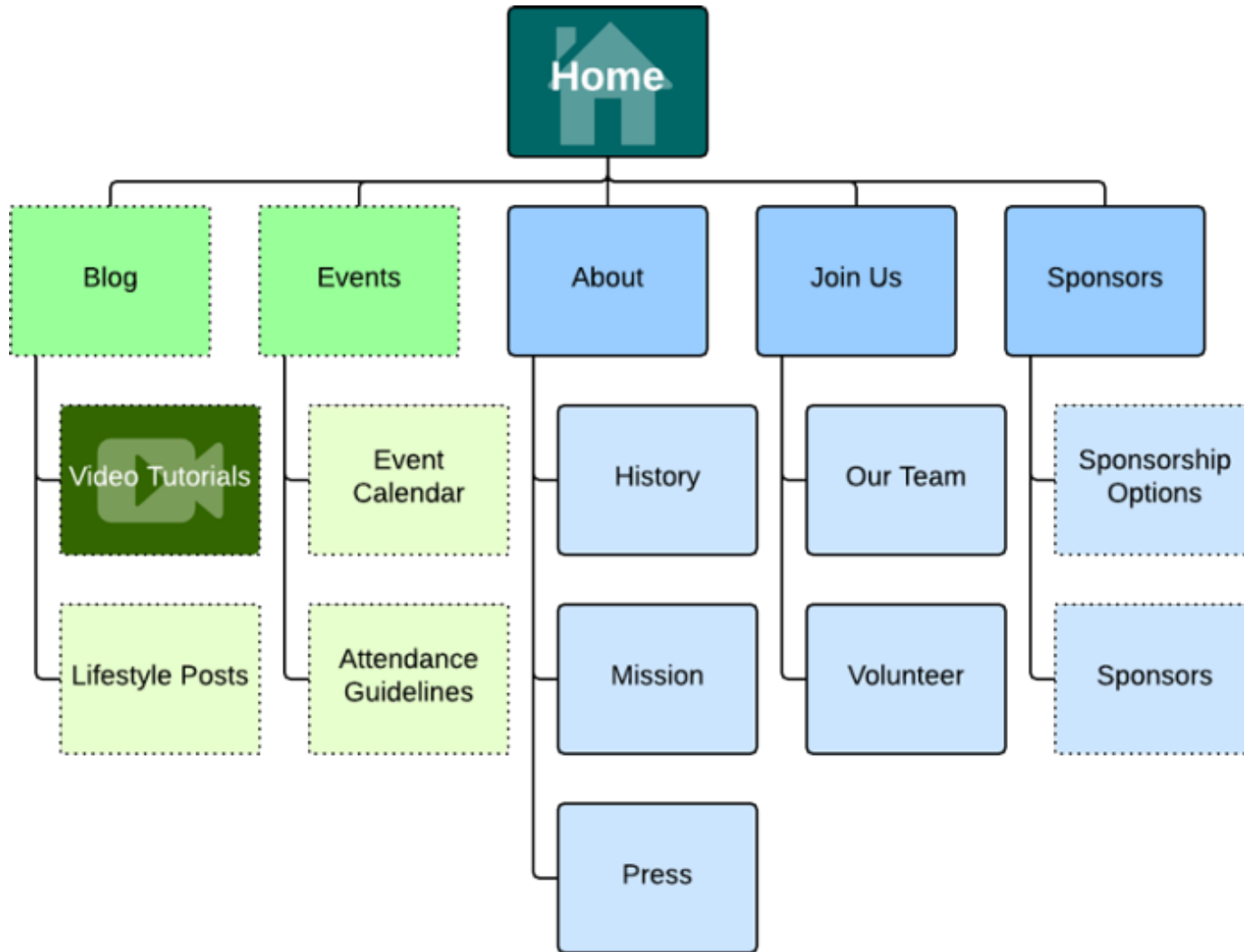
Sitemap Example 2
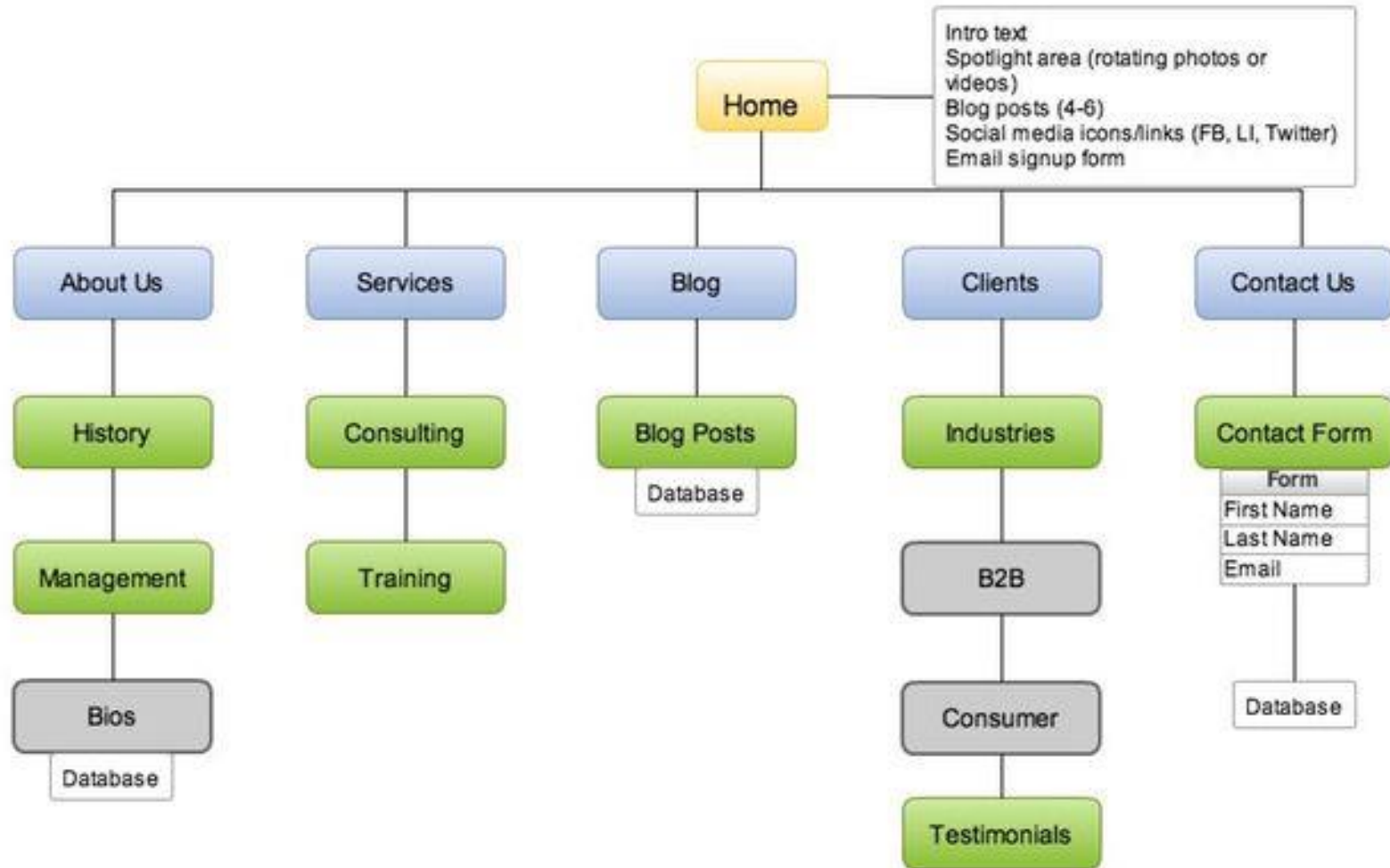
Tree Diagram

A tree diagram showing the structure for a sample office supply site. How HTML and other files are organized
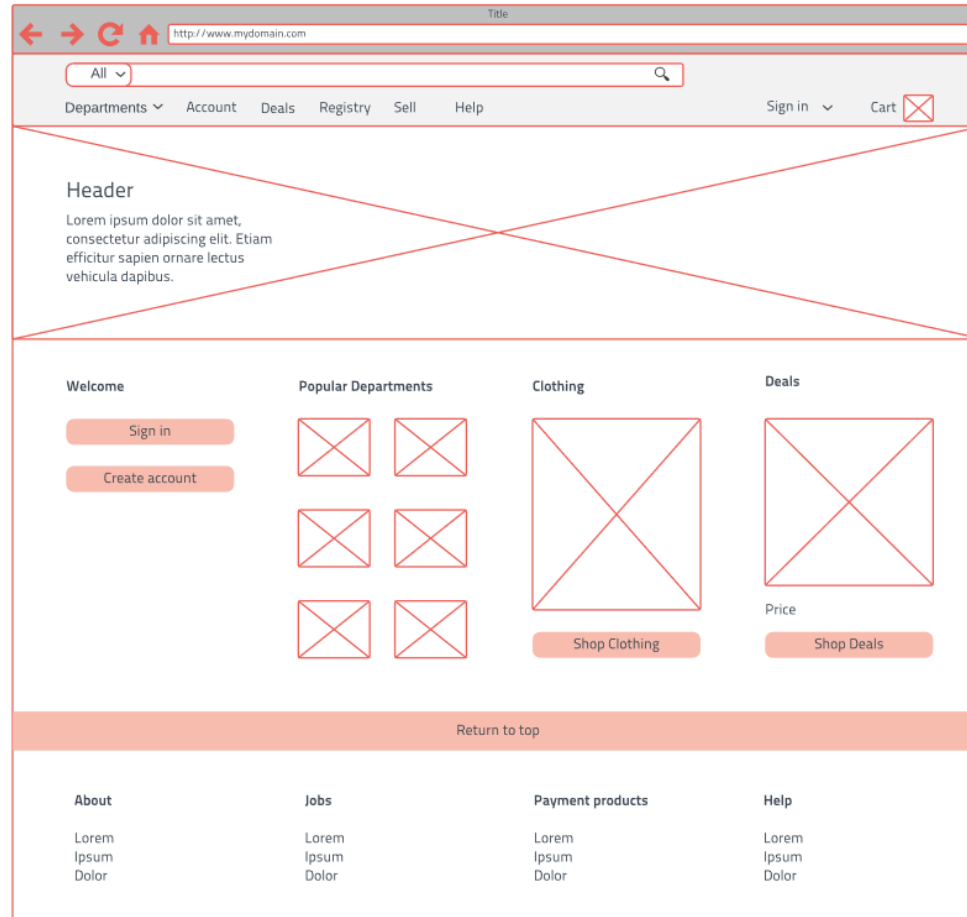
Organize Content

- All the content for the site should fit under each of the topic areas in the site structure.

- There might be several subcategories in each topic area.

Category Name	Folder Name
Paper	shop/paper/
Pens	shop/ pens/
Software	shop/software/
Furniture	shop/furniture/
Furniture, Desks	shop/furniture/desks/
Furniture, Chairs	shop/furniture/chairs/
Furniture, Bookcases	shop/furniture/bookcase/

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Wireframe Example 1

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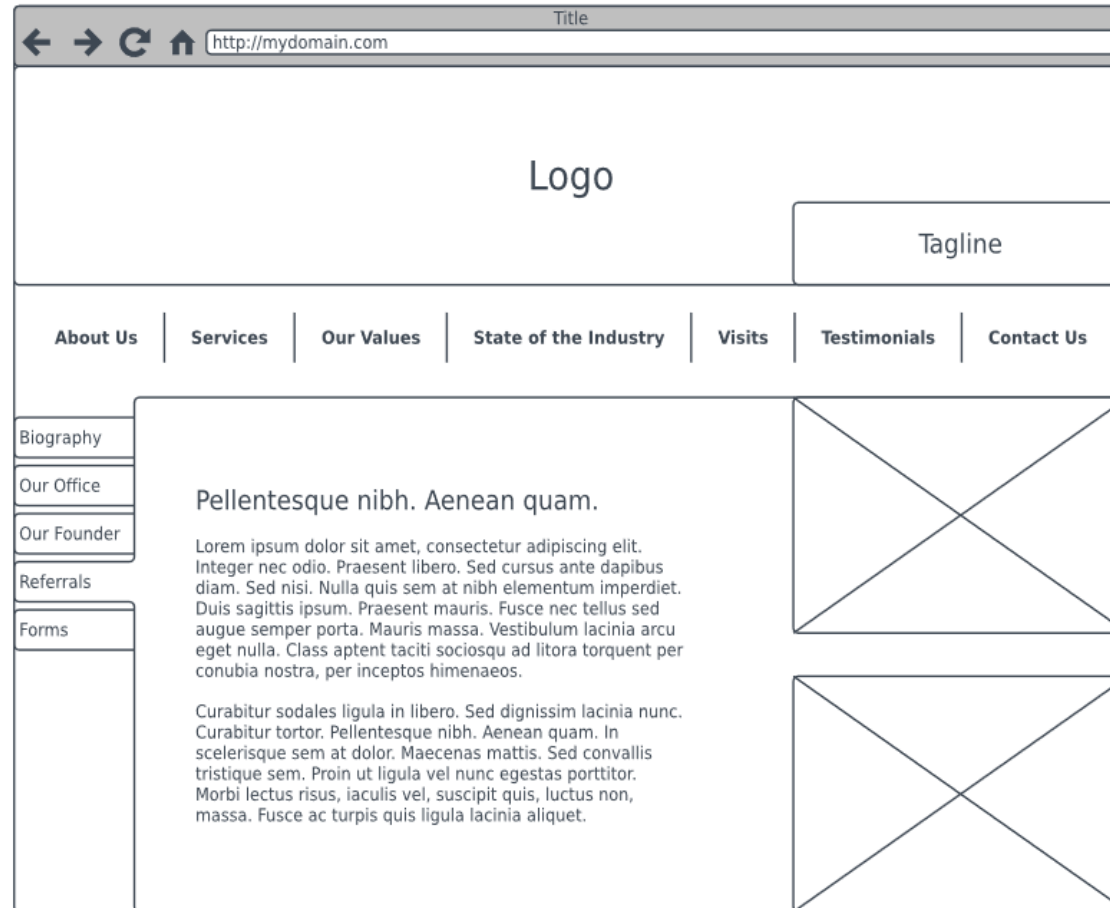
Wireframe Example 2

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3. Design and development

- The design element is largely influenced by the existing brand elements
- The color scheme, logo design and any other interactive design elements needs to incorporate the brand it stands for
- New company and startups can have more freedom to choose, but the website design still needs to appears consistent with the existing branding
- Once design hand-off to the development team actual coding process starts
- The designed platform, database and framework that were finalize in the planning stage will be coded into actual functioning webpages.
- Both front-end and back-end development need to incorporation of the
- website content into the design.
- The front-end coding involves HTML/CSS code and deploying it to run across the server

User Experience (UX) and User Interface (UI)

In web design there are two terms we need to clarify, the two terms are **U**ser **E**xperience (UX) and **U**ser **I**nterface (UI).

These two terms although seems similar and there differences are:
1. UX Is Not UI
2. UX Makes Interfaces Useful, UI Makes Interfaces Beautiful
3. UX Helps Users Accomplish Goals, UI Makes Emotional Connections
4. UX Design Is Done First, UI Design Is Done Second…(Sometimes)
5. UX Is Employed Across Products, Interfaces And Services, UI Only Pertains To Interfaces

Article - 5 Big Differences Between UX And UI Design
By Dawn Schlecht, updated on October 9th, 2017
URL https://careerfoundry.com/en/blog/ux-design/5-big-differences-between-ux-and-ui-design/

User Experience (UX)

User experience design uses approaches like

- human-computer interaction
- user-centered design

It also includes elements from similar disciplines like

- interaction design
- visual design
- information architecture
- user research, and others

User Interface (UI)

- User interface design requires a good understanding of user needs.
- There are several phases and processes in the user interface design:
  - Functionality requirements gathering
  - User and task analysis
    - Typical questions involve:
      - What would the user want the system to do?
      - How would the system fit in with the user's normal workflow or daily activities?
      - How technically savvy is the user and what similar systems does the user already use?
      - What interface look & feel styles appeal to the user?
  - Information architecture
  - Prototyping
  - Usability inspection or Usability testing
  - Graphical user interface design
  - Software Maintenance

Planning for Design a Web Site

4. Testing

- Testing is a critical step in the website design process, it should take place concurrently with development.
- End-to-end website testing includes
  - Functionality
    - ensures all the features within the website are validated against the functional specifications document
  - Usability
    - focuses on the ease of use in terms of accessibility, searchability and usefulness.
  - Interface
  - Compatibility
    - ensures that the website functions uniformly across a range of devices and operating systems, including mobile devices and tablets
  - Performance
  - Security testing

5. Launch and maintain

- Launching of the website
- Transfer from a local/development server to the live/production server
- Maintenance phase
  - Technical
    - Keeping website up and running.
    - Testing process is continuous as the site will be constantly updated with new content
    - Fix broken links if any
    - Adding and testing new features and content basis of user feedback and current trends to ensure stellar user experience
  - Non-technical
    - Content update – e.g. blog, events, update stock and add new inventories, update pricing and etc.
    - Answering customer feedback/blog
    - Remember – content, content and content

An Example from Apple

The URL clues the visitor to the name and location of the section being viewed.

This button has a different color scheme to show the visitor which section is currently being viewed.

This page title lists the name of the site as well as the page and section names.

This text is darker to show the visitor which aspect of the iPod section is currently being viewed.

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More Examples

For more well design web site you can read this article created by a Web design company call iMPACT - https://www.impactbnd.com/blog/18-award-winning-website-designs

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Now get to the work

First, is to select a HTML editor working best for you

- Tons and tons of them, and the number is still growing
- Table 1-3 lists a tiny number of them
- They can be divided into two categories
  - WYSIWYG editors
  - Text based editors

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WYSIWYG Editors

- They don't require knowledge of HTML – you can just drag and drove
- You can instantly see the layout/effect of your page
- They can speed your work, in some situations

Text-based Editors

- You have to know some HTML to use them (which is the reason why you are here, to learn to code in HTML and CSS)
- Better control -- WYSIWYG editors may write HTML in a variety of ways
- Faster pages -- WYSIWYG editors sometimes overcompensate for the amount of code needed to render a page properly
- Speedier editing -- the large-scale WYSIWYG editors can take a lot of memory and system resources, slowing both the computer and the development process
- More flexible while can be also very specific – you can produce the code exactly the way you want (skip the "auto-correct")

List Of HTML Editors

Tool	Average Price (U.S.)	Key Features
Amaya www.w3.org/Amaya/	Free	Open-source software project hosted by W3C Windows/Mac/Linux WYSIWYG visual editor (but no browser preview) Spell-checking Internationalized
BBEdit http://barebones.com/products/bbedit/	$49.99	Also offers a free, scaled-down version called TextWrangler Mac only Browser preview FTP upload Multiuser editing Text-based editor capable of handling many popular programming languages, including C, C++, CSS, Java, JavaScript, JSP, Perl, PHP, Ruby, HTML, SQL, and XML
CoffeeCup Pro/Free www.coffeecup.com	$69/free	Windows and Mac options available WYSIWYG visual editor FTP upload Spell-checking Templates Shopping cart creator Form builder
Dreamweaver www.adobe.com/products/dreamweaver	$399 (or $19.99/month)	Windows/Mac WYSIWYG visual editor with browser preview FTP upload Spell-checking Templates Server-side scripting Multiuser editing E-commerce building tools Mobile app/site development
Expression Studio 4 Web Professional www.microsoft.com/expression Note: Expression Web replaced Microsoft's Front Page.	$149	Windows only WYSIWYG visual editor with browser preview FTP upload Spell-checking Templates Server-side scripting Multiuser editing Web graphics editor Additional editing tools available
TextWrangler http://barebones.com/products/textwrangler/	Free	Mac only Text-based editor perfect for beginners Also has server administration tools

You can use any test based editor like Notepad ++ (free) or an editor that I have been using – *Microsoft Visual Studio Code* - It is free and can be downloaded from https://code.visualstudio.com It will run on Windows, Mac and Linux

This product suite is not available anymore, but Expression Web is free to download from Microsoft.

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Learn From the Pro

One of the best ways to learn HTML is to surf the Web and look at the HTML for sites you like

- Maybe those you don't like as well

- Most web browsers enable you to view the HTML source code of web pages

  - In older versions of web browsers

    - In Chrome, choose View | Developer | View Source

    - In Firefox or Mozilla, right-click and select View Page Source

    - In IE, choose View | Source or Page | Source

    - In Safari, you must first choose Safari | Preferences | Advanced and check the option to Show Develop menu in menu bar. Then, choose Develop | Show Page Source

  - In most newest web browsers, right-click and select View Page Source

View Page Source

Design example

- Chop Point Camp site : by Wendy Willard

  www.choppoint.org

- Research about the organization, target audience, goals.
  - Meeting Notes

- Sample questions:
  - Who are the target users/visitors of the site? Do you have any existing research regarding your client or user base, such as demographics, statistics, or other marketing information?
  - What business problem(s) will the web site address? What do you want to accomplish? What are your goals for the web site?

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- Target users and the functions they perform

User Group	Functions Performed at Site	Ages	Web Experience
1. Potential campers	-Check session dates -Sign-up -Get more information	10-18	Moderate-high
2.			

- Content
- Navigation

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Site structure

Chop Point Summer Camp Site Diagram v.1
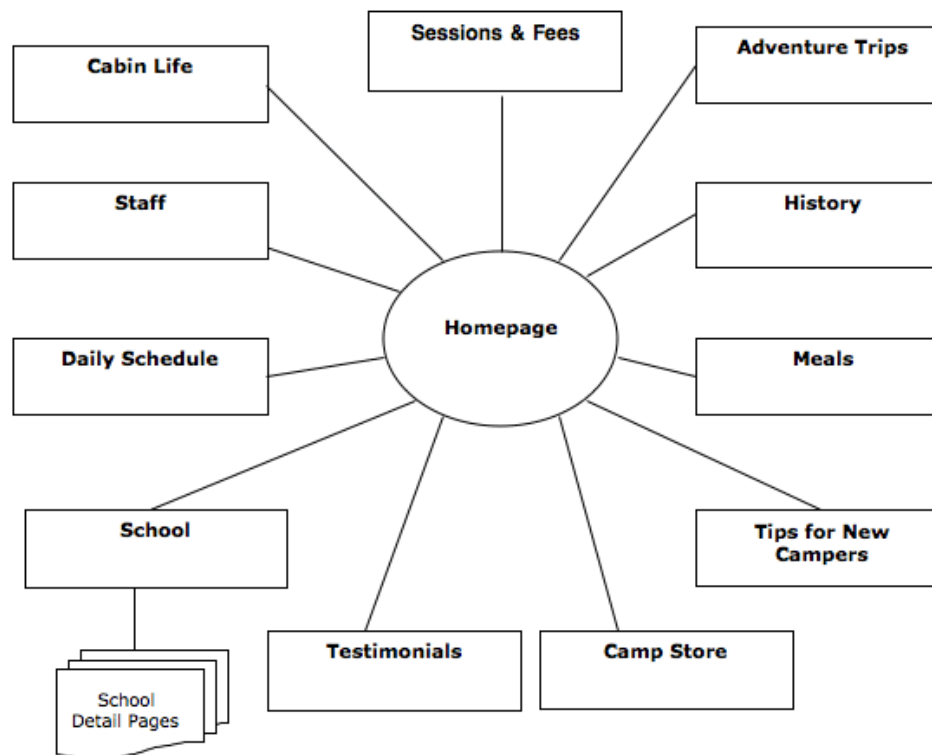
Note: This diagram is meant to show the basic structure of the site, and does not display the navigational flow from page to page.

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Questions?