

# Web Design Lifecycle

Usability – Accessibility – Testing – Implementation and Marketing

Essentials of Web Design  
CSCI 1210

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# Designing for Universal Usability

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## Two facets of diversity

### Technology diversity

Web is a very diverse deployment environment

Cannot design for one browser, platform, resolution, device, etc

### User diversity

Not every user has same abilities. People with certain handicaps may need special accommodations

## Two facets of diversity

### Purpose of the Web is large-scale open communication

Approx. 20 percent of U.S. has some kind of disability.

Approx. 14.1% of the U.S. is over the age of 65

Practically: Market exists. People need to be served

Legally: failing to do so may open up lawsuits

# Accessibility

**Accessible**—able to be used by people with handicaps. Usable for this audience

**Accessibility**—focus on creation of sites that are accessible

# Accessibility

## Primary concerns:

Visual impairment—low vision or no vision (blind)

Motor impairment—difficulty using traditional pointing devices and/or keyboard

Designing for accessibility is often neglected

Requires particular effort on part of designer

## Web Accessibility Initiative (WAI)

Research sponsored by the World Wide Web Consortium (W3C) ([www.w3.org](http://www.w3.org))

*"The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect."*

"The Web is fundamentally designed to work for all people, whatever their hardware, software, language, culture, location, or physical or mental ability. When the Web meets this goal, it is accessible to people with a diverse range of hearing, movement, sight, and cognitive ability."

<http://www.w3.org/WAI/>

## Web Accessibility Initiative (WAI)

W3C/WAI recommends:

Establish a team or individual whose purpose is to learn about accessible design

Have the above promote and educate design team(s) about importance, techniques, etc

## Accessibility Example: Poor Contrast

The gray color used for the font and border of this login interface fails the contrast ratio guideline

Affects: users with vision impairments (low vision, color blindness, etc.), and even users with good vision in brightly lit situations or low-contrast displays

Guideline: The visual presentation of text and images of text has a contrast ratio of at least 4.5:1 — WCAG 1.4.3 Contrast

Tools: Use the Google developer tools to determine if the color contrast on the page follows. Under “Audits”, you can check “Accessibility” to run an audit your current webpage

## Accessibility Example: Contrast

**Principle:** Make sure contrast between text and background yields readable text

**Why?** Many people are colorblind or lose visual acuity with age or handicap. Fully sighted people may experience eye strain

**Test:** View on monochrome monitor, or print web page with background showing (non-color printer) and examine output (Paletton/other services)

Turn on print background color in browser

**Remedy:** Adjust contrast as needed

## Accessibility Tools

<https://www.w3.org/WAI/ER/tools/>

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

<http://www.accesskeys.org/tools/color-contrast.html>

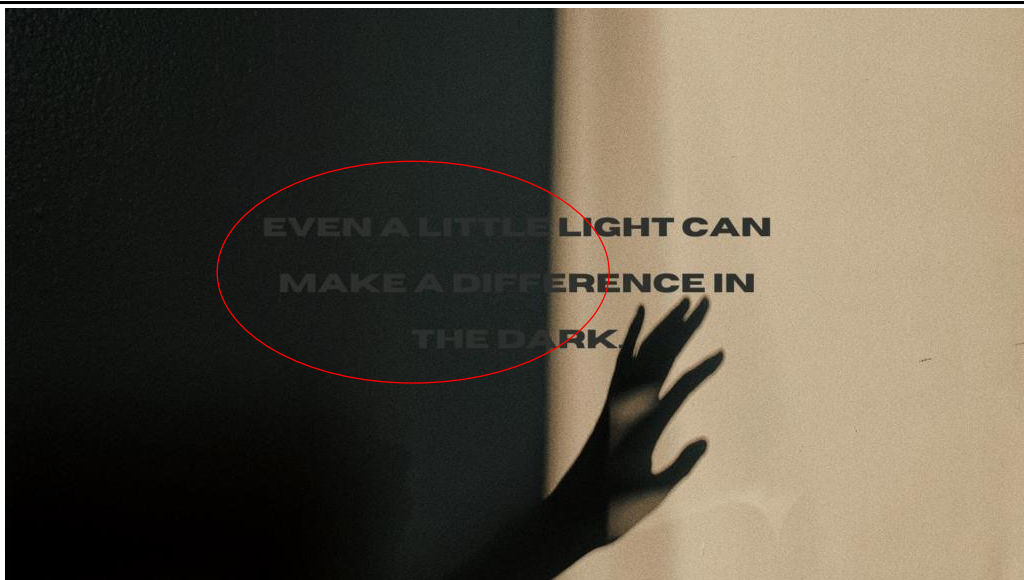
<http://colorfilter.wickline.org/>

<http://wave.webaim.org/>

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## Accessibility Example: Mouse

**Principle:** Make sure page is usable without mouse

**Why?** Special devices may be used or fine motor skills lacking

**Test:** Use keyboard only to navigate your site. Make sure you can access all links and controls. Check tab order.

**Remedy:** Remove controls or provide alternatives when problems discovered. Make sure all non-accessible navigation is paired with accessible alternative

## Easy Checks – A First Review of Web Accessibility

W3C WAI has a Working Draft on some guidelines for first review of a website for web accessibility. These items include:

- Page Title
- Image Text Alternatives (alt attribute)
- Headings
- Contrast Ratio ("Color Contrast")
- Resize Text
- Keyboard Access and Visual Focus
- Forms, Labels, and Errors
- Multimedia (video, audio) alternatives
- Basic Structure Check

For more, visit: <http://www.w3.org/WAI/eval/preliminary.html>

## Bad Practices

Using Flash animations

Using images as links

Using underlined text

Using too many colors

Not using any color contrast

Not using captions

Not using alt text

Not having a clear heading hierarchy

Using a web font that is not easy to read

Using only visual design elements without providing any text

Not providing any accessible content at all

Using a fixed font size that is too small to read

## Accessibility

Be aware of the need for accessibility and factor accessibility needs into your design process

Test accessibility before site deployment. Use human testers with accessibility needs if possible

Be attentive to new tools or techniques that improve accessibility, and cautious of techniques that create accessibility problems

Set a goal of progressively improving your development team's knowledge of accessibility



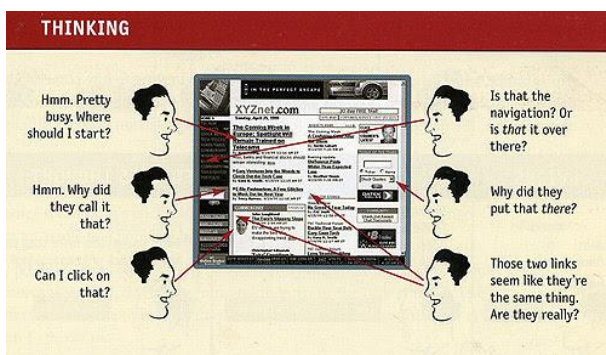
# Testing

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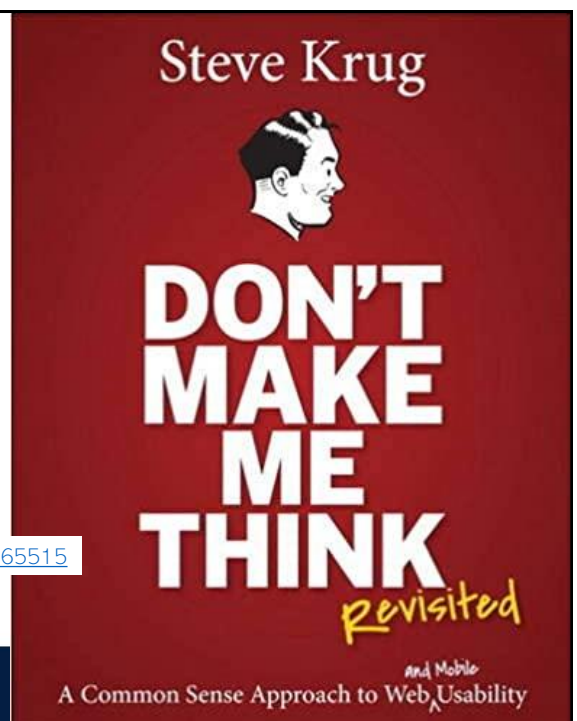
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## Usability Testing



<https://www.amazon.com/Dont-Make-Think-Revisited-Usability/dp/0321965515>

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## Usability Testing

When creating a site, we've already thought about the audience's:

- Desires and goals

- Computer and Internet skills

- Education, gender, age, occupation

## Usability Testing

Usability testing is a way to check if the site is meeting those needs

- Usefulness and utility can be measured

- Their satisfaction with the site – “likes” and “dislikes” – can be recorded as well

There are several types of testing, but the most common one involves watching users use the site and gathering data about what they're thinking and doing

## Choosing Participants

People who match the personas are a good starting point

- Find representative users from each of your audience groups

- Within groups, try to find a mix of skill and experience levels

Most tests are done with 5 – 10 users, but even 1 or 2 may give you some good information

## Tasks

Include the most commonly completed and most important tasks

Tasks should not be leading, and if possible, shouldn't contain the names of links or buttons to be clicked

When you write them, decide what defines a "success"

- How long should it take?

- What steps are required to complete the task?

- Do errors or different paths matter?

## Legalities for Major Studies

Institutional Review Board (<https://www.etsu.edu/irb/>)

Certifications for Human Subject Research

Consent forms

- Audio recording

- Video recording

- Participation in a research study

## Legalities for Major Studies

Stanford Prison Experiment: <http://www.prisonexp.org/>

Tuskegee Study of Untreated Syphilis in the Negro Male:  
<https://www.cdc.gov/tuskegee/timeline.htm>

The Milgram Experiment: <https://www.simplypsychology.org/milgram.html>

## Test Setup

Morae is software that can be installed on a laptop to record a test

- It can record the user's face with a webcam

- It records what happens on the screen along with mouse clicks and keystrokes

[https://csci1210.com/video\\_lectures/morae.php](https://csci1210.com/video_lectures/morae.php)

If something like this isn't available, you can record with a video camera, use screen capture software like Camtasia or OBS (Open Source), or just take good notes

## Conducting a Test

Introduce yourself and explain the purpose and process for the test

Let them know that you're testing *the site*, not their abilities

Give them the tasks

Watch what they do, and be sure to take note of anything that gave them trouble

Try to remain neutral and try not to help them complete the tasks

- This is much harder when you're testing your own design

## Conducting a Test

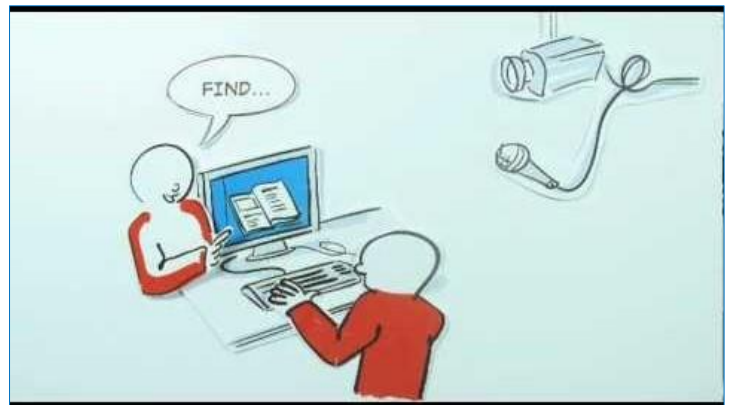
If they get stuck somewhere or you're not sure what is happening, ask neutral questions like "What do you think about X?" or "What are you doing now?"

Remember that users are more likely to be nervous and unsure of themselves when they're being watched

After the tasks are finished, you may want to wrap up with a questionnaire to gather their overall opinions about the site

Depending on the size of the site, a test should take about 30 minutes – 2 hours

## Conducting a Test





# Implementation and Marketing

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## "Publishing" a web site

Either self-host the site or outsource to a hosting company

Self-hosting:

- Establish computer system and needed software

- Find an ISP to provide Internet connection (Bandwidth is key issue)

- Work with ISP and/or InterNIC for an IP address

- Associate Domain Name with IP address

Outsource to hosting company:

- Contract with company for server space, functionality, and bandwidth

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## Drawing visitors to our site

"If you build it, they will come"--doesn't (necessarily) work on the web

Have a memorable domain name and promote

- In other media (TV, print, signs, bags, packages, etc.)

- In paid online advertising

- Using affiliates and cross-promotion

- Search engine placement (free and paid ad)

- Social Media

## Promotion of site-affiliate programs

Other web sites that promote ours to receive:

- Our promotion of their site on ours

- A commission every time someone clicks on our ad or visits our site from theirs and makes a purchase

- Pay-per-click vs. pay-per-sale

Establishing an effective **affiliate** program takes time, ongoing oversight, and legal consultation

## Promotion of site-affiliate programs

### Pay per Sale (PPS)

Publisher is paid on the basis of referral sales

Example - Publisher is only paid if user clicks the ad on publisher site and then makes a sale on the advertised site

As very low percentage people ends up doing the sale , The percentage commission is highest in case of PPS programs

They pay between 4-20% of each sale

## Promotion of site-affiliate programs

### Pay per Click (PPC)

Publisher is paid on the basis of Ad clicks that take the user to the advertised site

As Average number of people clicks the ads so this program offers less percentage commission than PPS

They pay between \$.25 to \$1.25 for each click depending on the product and number of unique clicks

## Promotion



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## The power of search engines

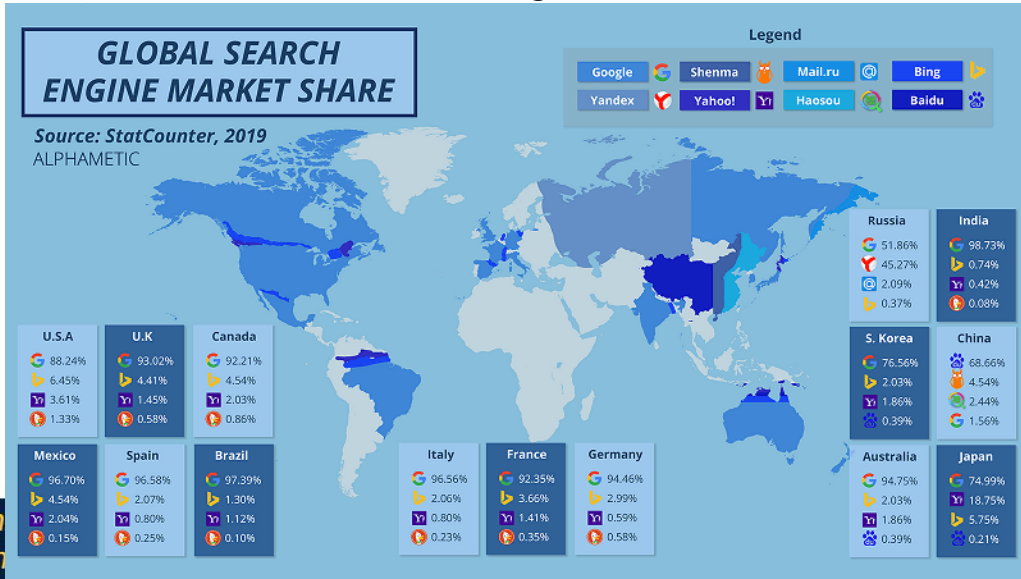
Search engine	Company	Software distribution license	Pages indexed	Daily direct queries	Results count	Advertisements
Baidu	Baidu	Proprietary	Unknown	Unknown	Yes	Yes
Bing	Microsoft	Proprietary	13.5 billion <sup>[1]</sup>	Unknown	Yes	Yes
DuckDuckGo	DuckDuckGo	Mixed <sup>[2]</sup>	Unknown	16 million <sup>[3]</sup>	No	Optional
Gigablast	Independent	Free	1 billion <sup>[4]</sup>	Unknown	Yes	No
Google Search	Alphabet Inc	Proprietary	40 billion <sup>[1]</sup>	9.022 billion <sup>[5]</sup>	Yes	Yes
Soso.com	Tencent	Proprietary	Unknown	Unknown	No	No
YaCy	Independent, Distributed, Peer-to-Peer	Free	1.4 billion <sup>[6]</sup>	0.13 million <sup>[6]</sup>	Yes	No
Yahoo! Search	Yahoo!	Proprietary	10 billion <sup>[1]</sup>	Unknown	Yes	Yes
Yandex Search	Yandex	Proprietary	>2 billion <sup>[7]</sup>	Unknown	Yes	Yes

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# The power of search engines



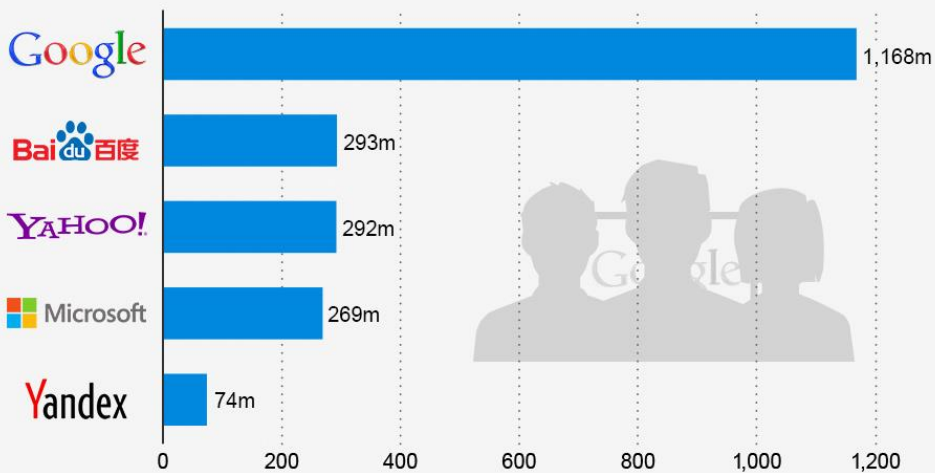
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## 1.17 Billion People Use Google Search

Unique searchers worldwide in December 2012 (in millions)



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statista  
The Statistics Portal

cc creative commons

Source: comScore

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## Fostering search engine placement

Make sure that, where possible, you request that a search engine add your site

<http://search.yahoo.com/info/submit.html>

<https://www.google.com/webmasters/tools/submit-url?pli=1>

<http://www.bing.com/toolbox/webmaster/>

Keyword advertising placement may be worthwhile investment

Many search engines rely on spiders and robots. Make sure meta information provides keywords and descriptions

## How do search engines work?

Seems trivial, actually very complex to do well.

1st generation search engines:

- Keyword-based searches

- Problems with synonyms and retrieval quality

- Only information on the pages are used

- Easy to cheat/fool (adding keywords multiple times in hidden text)

Modern search engines

- Site hyperlink structure important

- Links to documents represent a deliberate act and a "quality indicator"

# Summary

## Accessibility

Almost 20% of users

Vision

Motor

W3C Web Accessibility Initiative

# Summary

## Testing

IRB

Representative users

Morae / Video

Reports

## Summary

### Implementation and Marketing

Publishing a website

Search engines

Plan for drawing audience

Plan for fostering loyalty

## Review Questions

1. Approximately how many people in the US live with some form of impairment?

One in four

One in three

One in nine

One in five

## Review Questions

2. What are the two forms of diversity cited in Web Design?

Technology

Content

Designer

User

## Review Questions

3. What are the two primary impairments that affect user experience (UX) and the Web?

Vision

Hearing

Motor

Math



## Review Questions

4. What is the most important concern relating to vision impairment and web design

- Contrast
- Color
- Hue
- Saturation

## Review Questions

5. In testing a web site, what observations are relevant to site design?

- Navigation
- Ease of Use
- User ability
- User observations/feedback

## Review Questions

6. Using an affiliate program is a quick way to guarantee increased traffic to a web site.

True

False

## Review Questions

7. You can register a site directly with some search engines to improve its likelihood of appearing nearer the top of search results.

True

False

# Sources

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