User-Centered Design and ADA Compliance for Websites and Digital Systems

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University Outreach and Engagement
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Importance of Your Digital Presence

- Websites are a critical communication tool used for many purposes
- First impression of your website forms within 50 milliseconds
Design as a User-Centered Process

USER REQUIREMENTS ANALYSIS

USER-CENTERED DESIGN PROCESS

CONCEPTUAL DESIGN

LAUNCH & MAINTENANCE

USABILITY EVALUATION

DESIGN & IMPLEMENTATION
Usability – What is it? Why does it matter?

- Usability is focused on making your website and content as user-friendly and easy to navigate as possible.
Understanding Citizens as Website Users

- Feedback from citizens
  - Focus groups
    - Discover user needs
    - Explore design concepts
  - One-on-one testing
  - Website organization
Michigan DHHS – One-on-One Testing
Michigan Dept. of Treasury – Taxes (Before)
Tax Website Focus Groups

• Focus groups
  – General taxpayers
  – Tax professionals

• Concerns
  – Navigation
  – Searching for forms
  – Terminology
  – Layout
Organizing Tax Website Content (Online)
Tax Website Validation Task (Online)

- Direct Success: 16 (53%)
- Indirect Success: 8 (27%)
- Failure: 6 (20%)
- Skip: 0 (0%)

- Success: 80%
- Directness: 53%
- Time Taken: 15.6 seconds

*View the Pietree for this task*
Design Best Practices

- User needs → User requirements
- Perform high-level website reviews
- Web Content Accessibility Guidelines 2.0 AA
Accessibility – What is it? Why important?
Document Accessibility

- Documents within websites and/or sent out electronically must be accessible, too
- Publications, Press Releases, etc.
- Tutorials
  - http://webaccess.msu.edu
I know my partners and I will solve this problem.
Screen Readers

https://youtu.be/c0nvdiRdehw?t=53s
© The Tommy Edison Experience
Visual Impairments
Hearing Impairments
Physical Impairments
Cognitive and Reading Impairments
What Needs to Be Made Accessible
A **web page** or **webpage** is a document or information resource that is suitable for the World Wide Web and can be accessed through a web browser and displayed on a monitor or mobile device. This information is usually in HTML or XHTML format, and may provide navigation to other web pages via hypertext links. Web pages frequently subsume other resources such as style sheets, scripts and images into their final presentation.

Web pages may be retrieved from a local computer or from a remote web server. The web server may restrict access only to a private network, e.g. a corporate intranet, or it may publish pages on the World Wide Web. Web pages are requested and served from web servers using Hypertext Transfer Protocol (HTTP).

Web pages may consist of files of static text and other content stored within the web server's file system (static web pages), or may be constructed by server-side software when they are requested (dynamic web pages). Client-side scripting can make web pages more responsive to user input once on the client browser.
Mobile Apps
Videos

YouTube
Digital Signs and Kiosks
Voting Systems
Laws, Rules, and Standards
Americans with Disabilities Act (1990)
Global Standards

Web Content Accessibility Guidelines (WCAG) 2.0
W3C Recommendation 11 December 2008

This version:
http://www.w3.org/TR/2008/REC-WCAG20-20081211/

Latest version:
http://www.w3.org/TR/WCAG20/

Previous version:
http://www.w3.org/TR/2008/PR-WCAG20-20081103/

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Please refer to the errata for this document, which may include normative corrections.

See also translations.

This document is also available in non-normative formats, available from Alternate Versions of Web Content Accessibility Guidelines 2.0.

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Abstract

Web Content Accessibility Guidelines (WCAG) 2.0 covers a wide range of recommendations
Section 508 (Revised)
Courts
Recent Legal Settlements

**Government**
- Cedar Rapids, Iowa (2015)
- Chaves County, New Mexico (2015)
- Champaign County, Illinois (2015)
- Fallon, Nevada (2015)
- Galveston County, Texas (2015)
- Humboldt County, California (2016)
- Isle of Palms, South Carolina (2015)
- Lumpkin County, Georgia (2015)
- McLennan County, Texas (2015)
- Merced County, California (2015)
- Milwaukee, Wisconsin (2016)
- Nueces County, Texas (2015)
- Orange County Clerk of Courts (2014)
- Pennington County, South Dakota (2015)
- Parowan, Utah (2015)
- Robeson County, North Carolina (2015)
- Ruidoso, New Mexico (2015)
- Vero Beach, Florida (2015)
- Yakima County, Washington (2015)

**Education**
- Atlantic Cape Community College (2015)
- Bellingham School District (2016)
- Chandler Unified School District (2014)
- Davidson Academy of Nevada (2016)
- edX (2015)
- Florida State University (2014)
- Granite School District (2016)
- Guam Department of Education (2016)
- Law School Admission Council (2011)
- Louisiana Tech University (2013)
- Montana School for the Deaf and Blind (2016)
- Nevada Department of Education (2016)
- Oregon Department of Education (2016)
- Penn State University (2010)
- Seattle School District Consent Decree (2015)
- Santa Fe Public Schools (2016)
- University of Cincinnati (2014)
- University of Montana (2012)
- University of Phoenix (2015)
- Youngstown State University (2014)
- Washington Office of Superintendent of Public Instruction Superintendent (2016)
- Washoe County School District (2016)

**Nonprofit**
- American Cancer Society (2011)
- Massachusetts Eye and Ear Infirmary (2017)
- San Francisco Federal Credit Union (2016)

**Corporate**
- Bank of America (2015)
- Carnival Corporation (2015)
- Charles Schwab (2012)
- Colorado Bag & Baggage - 2017
- E*Trade (2016)
- Greyhound Lines, Inc. (2016)
- H&R Block Consent Decree (2014)
- Hilton Consent Decree (2010)
- Major League Baseball (2012)
- Motley Fool, LLC - 2017
- Peapod (2014)
- Rite Aid (2008)
- Safeway Web Accessibility (2013)
- Scribd (2015)
- Sweetgreen (2017)
- Weight Watchers (2013)
- Winn-Dixie (2017)

http://www.d.umn.edu/~lcarlson/wcagwg/settlements/
WCAG 2.0 / Section 508 & ADA
WCAG 2.0 / Section 508
Document Structure

- Heading 1
  - Heading 2
  - Heading 2
    - Heading 3
  - Heading 2
Keyboard Support
Navigation
Forms and Data Submission

Registration

First Name *: Graham
Title *: Assistant Director
Government Agency *: Michigan State University

Last Name *: Pierce
Department *: Usability/Accessibility Research and Consulting
Agency Type *:

Address 1 *:
Please enter your address including street name and apartment number if applicable

Address 2:
City *: East Lansing
State / Territory *: Michigan
Zip *: 48824
Email *: gspierce@msu.edu

Phone *:

Please enter your work phone

[I] This field is required
By checking this box, you verify that you work for a certified government agency, including State, County, Municipality, Court, School, etc., within the United States and that you are not a private vendor or citizen.

Enter all of the words or numbers you see

Districts

Register

Privacy & Terms
Audio and Video Media
Color and Visual Characteristics

Find out how we’re bringing millions into the financial fold

Sign up  Log in

See how it works
Custom Elements and Dynamic Content
Evaluating Accessibility
The Question
What About Automated Scanners?
No!
Sorry!
Not Just Code
Human Investigator
Human Judgment
WCAG 2.0 AA Requirements

43
Human Judgment Necessary

42
What Can Automated Tools Do?

Warn you when some things might be wrong
What Else Can They Do?

Process Management
What Can't They Do?

Tell you that anything is correct (other than Parsing)
Manual Evaluation
Expert Reviewers
Screen Readers
Color Contrast

The Colour Contrast Analyser shows the contrast ratio for different color blindness conditions. The selected colors (#FF0000 for foreground and #00FF00 for background) result in a pass for Normal vision but fail for other color blindness types.

- Normal: The contrast ratio is 2.9:1
- Protanopia: The contrast ratio is 4.3:1
- Deuteranopia: The contrast ratio is 1.7:1
- Tritanopia: The contrast ratio is 2.5:1
Code Inspection
Mobile Testing
MSU Evaluation Protocol

Introduction

This tiered protocol for evaluating Web Content Accessibility Guidelines (WCAG) 2.0 AA was developed by Michigan State University Usability/Accessibility Research and Consulting (MSU UARC). This document is intended to provide a simple and standardized accessibility evaluation protocol for faculty, staff, and students at MSU to use on websites and digital content, but is not a substitute for an accessibility evaluation by trained experts or for the official WCAG 2.0 language from the World Wide Web Consortium (W3C). Following this protocol does not guarantee or certify accessibility, nor fulfillment of WCAG 2.0 AA specifications, which can be consulted in their entirety at http://www.w3.org/TR/WCAG20/. While developed for MSU, this document may be equally effective for other institutions and organizations, as it does not rely on any MSU-specific resources or requirements.

This evaluation protocol is designed to be easily used by individuals with limited time and limited knowledge of accessibility, and is not intended to be complete or comprehensive. Reviewers should always start with Tier 1 and move through tiers in order, until they run out of time or reach the limits of their abilities. Tiers should always be completed in full (e.g., do not conduct only half of the tests in a given tier).

The MSU IT Services Digital Content & Accessibility Team (webaccess@msu.edu) is available to provide free assistance in using this document to MSU faculty, staff, and students. MSU UARC (uarc@msu.edu) is available to provide assistance and to conduct high-level and full accessibility evaluations for individuals and organizations inside and outside of MSU (for a cost).

Online Resources

- Michigan State University (MSU) Web Accessibility: http://webaccess.msu.edu/
- MSU Usability/Accessibility Research and Consulting (UARC): http://usability.msu.edu/
- World Wide Web Consortium (W3C): http://www.w3.org/
  - Web Accessibility Initiative (WAI): http://www.w3.org/WAI/
  - Web Content Accessibility Guidelines (WCAG) 2.0: http://www.w3.org/TR/WCAG20/
  - Accessible Rich Internet Applications (WAI-ARIA) 1.0: https://www.w3.org/TR/wai-aria/
- NVDA Screen Reader: https://www.nvaccess.org/
- Colour Contrast Analyser: https://www.paciellogroup.com/resources/contrastanalyser/
- Web Accessibility In Mind (WAIIM): http://webaim.org/
  - Using NVDA to Evaluate Web Accessibility: http://webaim.org/articles/nvda/
  - Testing with the NVDA Screen Reader: http://webaim.org/blog/testing-with-the-nvda-screen-reader/
  - Using VoiceOver to Evaluate Web Accessibility: http://webaim.org/articles/voiceover/
## Tier 1

Always complete tiers in full (i.e., do not skip any tests). If pages do not contain any audio/video content, mark "N/A" as appropriate.

<table>
<thead>
<tr>
<th>Test</th>
<th>Protocol</th>
<th>Pass</th>
<th>Fail</th>
<th>N/A</th>
<th>Notes</th>
<th>WCAG 2.0 SC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Keyboard Focus Visibility</td>
<td>Use the tab key on the keyboard to move through the page, and make sure there is always a clearly visible way to tell where focus is.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.4.2</td>
</tr>
<tr>
<td>2. Keyboard Focus Order</td>
<td>Use the tab key on the keyboard to move through the page, and make sure the order that elements receive focus makes sense. Make sure inactive/disabled parts of pages aren’t reached by keyboard.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.4.3</td>
</tr>
<tr>
<td>3. Keyboard Access</td>
<td>Make sure everything on a page works with a keyboard (i.e., everything that can be done with a mouse/Touchscreen also can be done without one).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.4.4</td>
</tr>
<tr>
<td>4. Keyboard Traps</td>
<td>Make sure keyboard focus can’t be stuck anywhere (i.e., you can get out of everything you can get into with a keyboard, without needing to use a mouse or touchscreen).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.4.5</td>
</tr>
<tr>
<td>5. Heading Levels</td>
<td>Go to <a href="https://www.webaim.org/">https://www.webaim.org/</a> and enter the site address. Click on the bottom tab on the left side of the page to bring up the Outline view. Make sure there is only one &quot;h1&quot; in the list, that no levels are skipped (e.g., it doesn’t jump from &quot;h1&quot; to &quot;h3&quot;), and that all headings are nested properly (i.e., the overall structure makes sense).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.3.1</td>
</tr>
<tr>
<td>6. Color Contrast (Visual)</td>
<td>Look for text and icons (not including logos) that are hard to read against the background due to the colors used (e.g., light grey text on white or green text on blue).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.4.3</td>
</tr>
<tr>
<td>7. Video Captions</td>
<td>Make sure all prerecorded videos have captions. Make sure captions are accurate.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.2.2</td>
</tr>
<tr>
<td>8. Live Video Captions</td>
<td>Make sure all live videos (livestreams) have captions. Make sure captions are accurate.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.2.2</td>
</tr>
<tr>
<td>9. Audio Controls</td>
<td>If there is any audio (including audio in a video) that plays automatically and lasts for more than 5 seconds, make sure that there is a way to stop the audio on the page. Make sure the controls work with the keyboard.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.4.1</td>
</tr>
<tr>
<td>10. Video/Animation Controls</td>
<td>If there is any moving, blinking, or scrolling content (including banner rotators and videos) that starts automatically and lasts for more than 5 seconds, make sure that there is a way to stop them on the page. Make sure the controls work with the keyboard.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.4.2</td>
</tr>
</tbody>
</table>
Policies
Policy
Training
Procurement
Exceptions
Complaints
Timeline
Fixing After Development, Purchase, or Deployment
Why Not Wait and Fix Things Later?
Time
Money
Document Issues
Determine Causes
Attempt to Fix
Total Loss
Research Alternatives
Start from Scratch
Expensive!
"Easy" Fixes?
Overwhelming
Worst-Case Scenario
Working with External Vendors
Budgeting
Evaluation Timeline

July 17
SERVICES AGREEMENT WITH UNIVERSITY OUTREACH AND ENGAGEMENT AT
MICHIGAN STATE UNIVERSITY

Thank you for your request for services from University Outreach and Engagement (USE), a division of University Outreach and Engagement (USE) or Michigan State University.

1. Purpose. The University, through USE, will perform the services and provide the deliverables described in Exhibit A.

2. Payments. You agree to pay, when you receive invoices, the sum of money specified in Exhibit A.

3. Confidentiality. Confidential information means any material, whether written or not, and consists of nonpublic information that is known only to you. If you provide confidential information to USE, USE will keep it confidential, and USE's duty to keep it confidential shall not apply if USE otherwise discloses confidential information to USE's customers.

4. Intellectual Property. Any intellectual property you provide to USE will not infringe on the intellectual property of any third party.

5. No Warranty. USE makes no warranty, express or implied, that the services will be performed as described in Exhibit A.

6. Termination. USE may terminate this agreement at any time, with or without cause.

7. Governing Law. This agreement is governed by the laws of the State of Michigan and may be terminated by either party upon notice.

8. Entire Agreement. This agreement constitutes the entire agreement between the parties and supersedes all prior agreements and understandings.

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