



Accessibility Testing

Introductory Overview

Welcome to Accessibility Testing

Topics covered in this Accessibility Testing overview:

- Inclusive design principles overview
- Definition
- Testing Types
- Testing Techniques to use
- Regulatory compliance factors
- Challenges
- Sampling of available tools

Accessibility & Inclusive Design

Principles Overview

Inclusive design focuses on:

- Human centric design approach
- Actively including accessibility in design and functional requirements
- Keep users with disabilities in mind during the entire SDLC
- Gather feedback with user acceptance testing from disabled users
- Design, code and provide ongoing testing for digital access equality

Accessibility Testing Definition

- Website & App access to a diverse user base with varying ranges of disability.
- Disability types vary for hearing, vision, and movement restrictions or variances.
- Ensure equal access to all users by expanding the user base.

Accessibility Testing Background

- Accessibility in web and mobile applications has been largely ignored or treated as an optional convenience.
- Increasing reliance on online and app-based functionality access impacts every person regardless of disability.
- Imagine if you could not access a web page for medical treatment, job postings, banking, government programs, or online shopping.
- Accessibility testing is about equal access. Not providing access to nearly [61+ million adults](#) in the US alone limits business opportunities and constitutes direct discrimination. Discrimination is becoming a [legal means to force application providers](#) to design and code applications for all users or face legal and financial proceedings, fines, and fees.
- Accessible and inclusive design principles and accessibility testing ensure all users can access websites and mobile apps with working functionality.

Accessibility Testing Benefits

- Expanding access to users with diverse abilities expands the customer base.
- Improved overall usability helps retain customers.
- Improve brand image by providing equal access.

Accessibility Testing Benefits 2

- Increased navigational options improve usability across the entire customer base.
 - Menu Structures:
 - Ordered or unordered lists
 - Indicate current or in focus item using invisible text
 - Menu Styling
 - Location (top, or left side)
 - Labels as visual headings or tabs

Accessibility Testing Benefits 3

- Benefit all user experience interactions using:
 - Readability
 - Text should resize appropriately when expanded or contracted
 - Handle all language types and maintain readability
 - Avoid using all uppercase text
 - Size
 - Responds appropriately when users re-size screen up or down.
 - Include white space

Accessibility Testing Benefits 4

- Sharper color contrasts add to the visual impact for all users
- Increase positive user experience and ease of use
 - Sharp color contrast enhance viewability
 - Increases perception and enhances understanding

Accessibility Testing Benefits 5

- Clear decoding of on-page elements or on-page optimization
- Increase in SEO optimization that adds context to search engine results
 - Use of tags, alternative textual elements to increase understanding
 - Higher SEO, more users find the website

Accessibility Testing – Unique Features

- Regulatory compliance requirements nationally and internationally.
- User experience impacts all users regardless of ability.
- Device integration of various types.
- Usability focus on a wide variety of disability types and levels.

Accessibility Testing Standards

Compliance Considerations

- Standards:
 - Web Content Accessibility Guidelines ([WCAG](#))
 - Perceivable
 - Operable
 - Understandable
 - Robust
 - User Agent Accessibility Guidelines ([UAAG](#))
 - Applicable to all web browsers that render web content.

WCAG Standards 1

- WCAG Principles Basic Examples:
 - Principle 1: Perceivable
 - All non-text content includes a text alternative
 - Recordings or video include captions
 - Alternative text for audio and media
 - Sign language alternative option
 - Information, structure and relationship available in text

WCAG Standards 2

- WCAG Principles Basic Examples:
 - Principle : Operable
 - All functionality responds to keyboard input
 - No keyboard traps – once keyboard used to focus content, other methods have no result
 - Keyboard keystrokes are not timed for accurate response

WCAG Standards 3

- WCAG Principles Basic Examples:
 - Principle : Understandable
 - The default language is settable.
 - Idioms and jargon in words has alternative definitions available
 - Reading level at lower secondary education level (8th grade)
 - Mechanism included to identify pronunciation of words in text

WCAG Standards 4

- WCAG Principles Basic Examples:
 - Principle : Robust
 - Use unique ids for all page content elements
 - Ability to programmatically determine all states and properties
 - Status and error messaging are programmatically determined for assistive device interpretation

WCAG Standards Reference Information

- More detailed WCAG information:
 - <https://www.w3.org/WAI/WCAG21/quickref/#principle1>

UAAG Accessibility Standards 1

- UAAG Standards apply to user agents
 - User agents include:
 - Browsers
 - Browser extensions
 - Media players
 - Screen readers
 - Any application that renders web content
 - User agents following UAAG 2.0 improve accessibility through the user interface and the ability to communicate with assistive technologies.

UAAG Accessibility Standards 2

- UAAG 5 Principles for accessible user agents:
 - Perceivable
 - Operable
 - Understandable
 - Integrates functionally with assistive agent controls
 - Compliance with WCAG

Accessibility Testing UAAG and WCAG

- UAAG follows the WCAG standards but applies to user agents rather than website and mobile applications.
- Integration testing between applications and devices for compliance to WCAG

Accessibility Testing Regulatory Compliance Considerations

- Legal Regulatory Requirements - US
 - Americans with Disabilities Act ([ADA](#))
 - Legally enforceable regulatory requirements for access to all users with disabilities relating to digital applications on websites and mobile apps.
 - In 2019, approximately [2200 ADA lawsuits](#) were filed against providers of inaccessible websites and mobile apps
 - Rehabilitation Act ([Section 508](#))
 - Federal agencies must make electronic and IT assets accessible to people with disabilities.
 - Applies to all Federal departments and contractors.

Accessibility Regulatory Compliance 1

- ADA regulations are legal requirements.
 - Use of accessible coding
 - Responsive to various color, font, and zoom settings
 - Online forms and table elements are accessible using descriptive HTML tags
 - Post documents in PDF and a text-based format

Accessibility Regulatory Compliance 2

- ADA requirements sampling continued:
 - Alternative text for images
 - Ability for users to request accessible information or services by phone or email
 - Ensure alternative methods exist for people to access information and services posted on the application.
 - Ensure integration functionality with assistive devices.

ADA Regulatory Compliance Information

- For more detailed information on accessibility for mobile and web applications:
 - <https://www.ada.gov/pcatoolkit/chap5toolkit.htm>

Accessibility Testing – International Regulations Sampling

- Accessibility of Ontarians with Disabilities Act
 - Business operations in Ontario must be accessible or face financial penalties.
- European Accessibility Act
 - Global requirements for accessibility for digital products and applications sold across Europe.
- Australia Disability Discrimination Act
 - Global accessibility requirements for digital accessibility across Australia and New Zealand.

Accessibility Testing Device Types

- Screen Readers
- Speech input and recognition
- Head pointers
- Eye trackers
- Single switch access
- Screen magnifiers

Accessibility Devices 1

- Screen readers:
 - assistive technology that renders text and image content as speech or braille.
- Speech input and recognition:
 - Users interact with a digital device using voice commands which is converted into text.

Accessibility Devices 2

- Head pointers
 - devices that interpret mouse movement as a pointer controlled by voluntary head movements
- Eye trackers
 - sensor technology that enables a computer or digital device to determine what the user is looking at at any given time.

Accessibility Devices 3

- Single switch access
 - assistive technology used by people with motor impairments to access and control computers, smartphones, electric wheelchairs, and smart home appliances
- Screen magnifiers
 - Assistive technology that changes the graphical output of a computer or digital device to present enlarged screen content.

Accessibility Testing Complexity

- The complexity of accessibility testing means planning becomes essential
 - Know what can and cannot be tested
 - Document what was tested
 - Retain tests and test plans executed
 - Retain defects records
 - Manage risk around what cannot be tested
 - For example, QA testers may not have access to a particular device type for testing.

Accessibility Testing – Testing Types

- Manual testing
- Automated testing
- Crowdsourcing
- User acceptance testing

Accessibility Testing – Testing Techniques

- Functional
- Device
- Integration
- Compatibility
- Usability
- Regulatory compliance

Accessibility Testing – Testing Techniques 2

- Consider combining testing techniques
 - Functional testing the application along with the device to complete functional, device, compatibility and integration testing in a single execution.
 - Regulatory compliance may be best executed off a checklist listing each requirement or a test matrix or table.
 - Usability test throughout the testing cycle.
 - Always be on the lookout for clarity and consistency in functionality

Accessibility Testing - Challenges

- Understanding and testing against regulatory requirements that differ between countries.
- Assistive device testing access and use.
- Adding accessibility testing to test execution plans.
- Scope of variance based on disability and disability severity

Accessibility Testing - Tools

- [Wave](#)
- [t.a.w](#)
- [WebAnywhere](#)
- [Accessibility Testers](#)
- [Harvard University](#) – both manual and automated

Accessibility Testing – Tools 2

- [A11y Color Contrast Accessibility Validator](#)
- [Siteimprove](#)
- [Tenon](#)
- [HTML CodeSniffer](#)
- [ACTF aDesigner](#)

Accessibility Testing – Tools 3

- Check development tools used for built-in accessibility testing tools and access to device farms.
 - AWS
 - Visual Studio
 - Google
- Check device farms currently used for assistive device access.



Accessibility Testing Overview Complete!

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