



Human Potential, Digitally Delivered





# Getting started with Accessibility Testing

HARISH BEERAM

# CDC.Gov stats on Accessibility

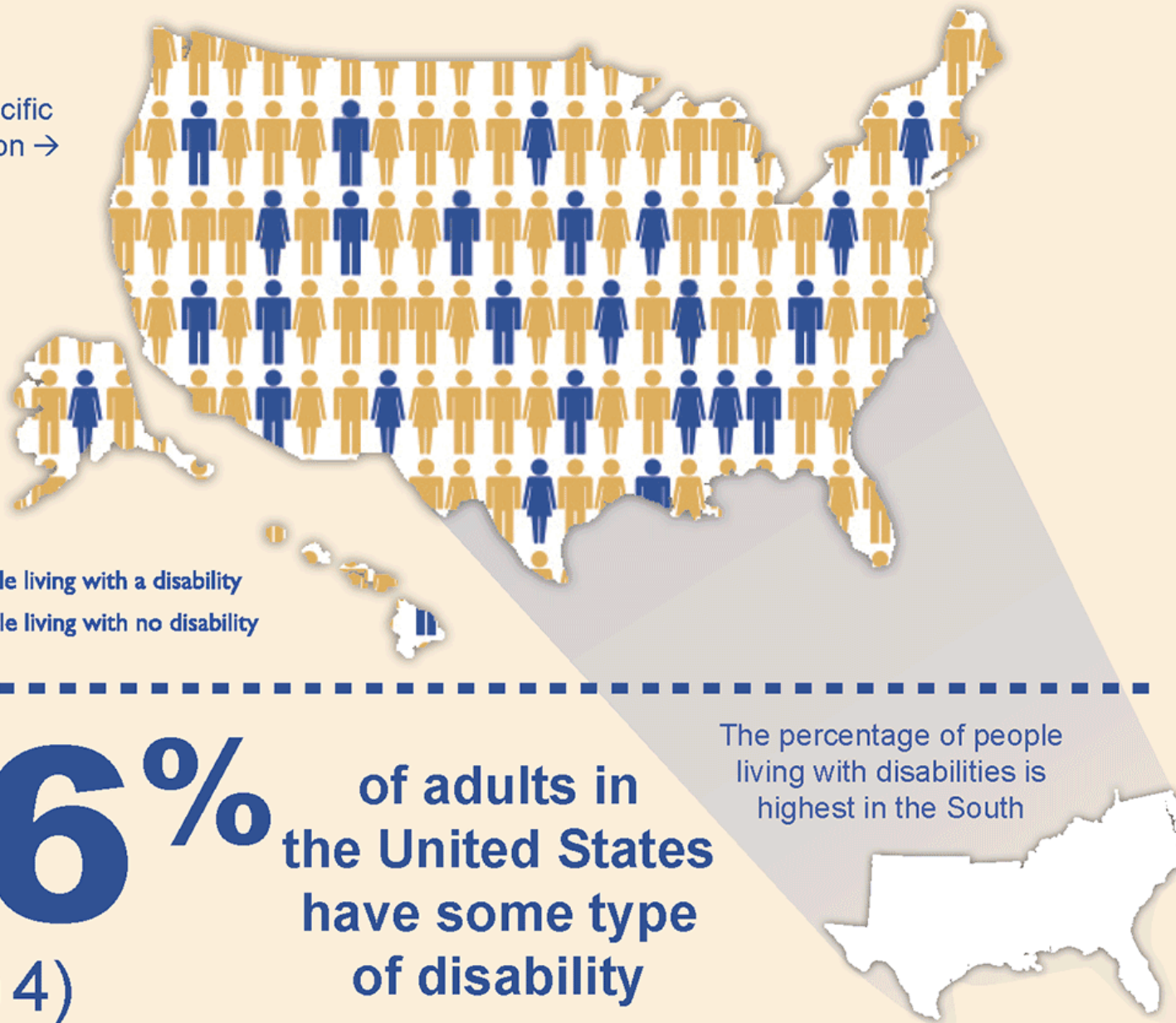
## 61 million adults in the United States live with a disability

Click for  
state-specific  
information →

 People living with a disability  
 People living with no disability

**26%**  
(1 in 4) of adults in  
the United States  
have some type  
of disability

The percentage of people  
living with disabilities is  
highest in the South



## Percentage of adults with functional disability types

13.7%

### MOBILITY

Serious difficulty  
walking or  
climbing stairs



10.8%

### COGNITION

Serious difficulty  
concentrating,  
remembering, or  
making  
decisions



6.8%

### INDEPENDENT LIVING

Difficulty doing  
errands alone



5.9%

### HEARING

Deafness or  
serious difficulty  
hearing



4.6%

### VISION

Blindness or  
serious difficulty  
seeing



3.7%

### SELF-CARE

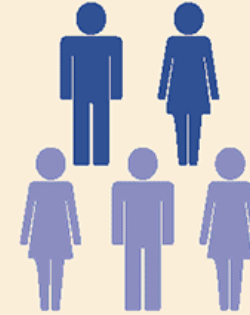
Difficulty dressing  
or bathing



## Disability is especially common in these groups:

**2**in**5**

adults age 65  
years and older  
have a disability



**1**in**4**

women have  
a disability



**2**in**5**

Non-Hispanic  
American Indians/  
Alaska Natives  
have a disability



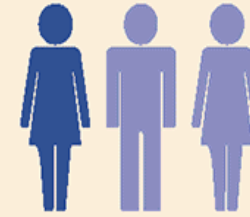


## Healthcare access barriers for working-age adults include

**1 in 3**

adults with disabilities  
(18-44 years)

do not have a  
usual healthcare  
provider



**1 in 3**

adults with disabilities  
(18-44 years)

have an unmet  
healthcare need  
because of cost  
in the past year



**1 in 4**

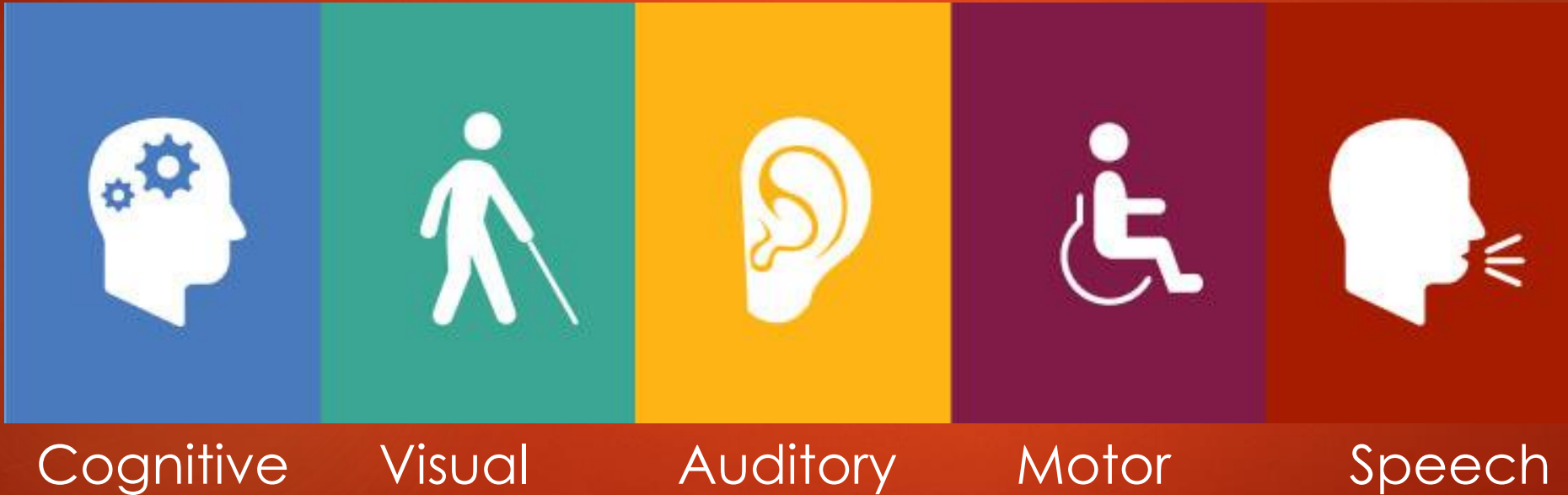
adults with disabilities  
(45-64 years)

did not have a  
routine check-up  
in the past year



# What is Accessibility?

Giving people with disabilities and impairments alternative ways to access our products



# Developing for Accessibility helps all

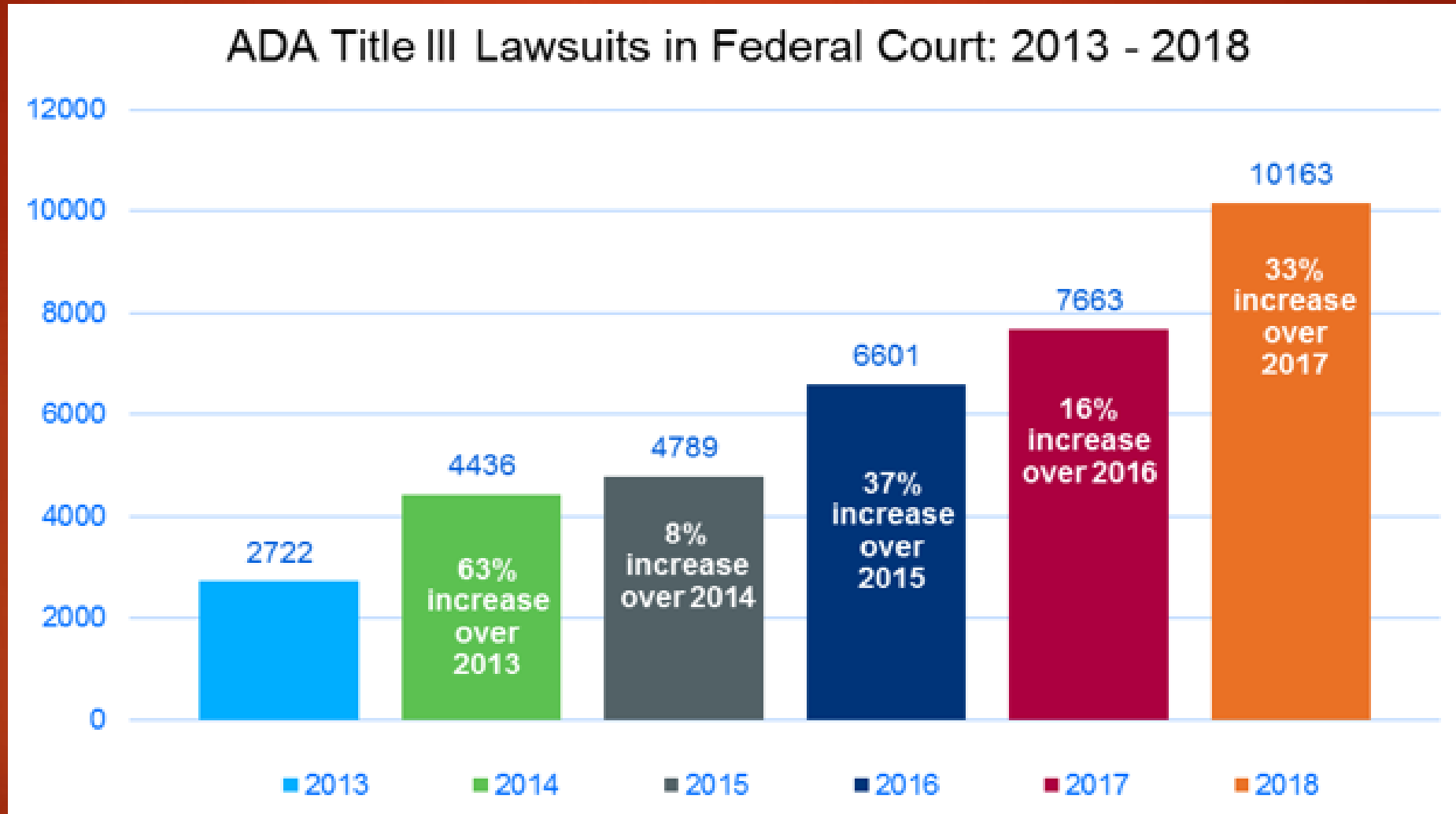




# How does it help? Avoid Law Suits



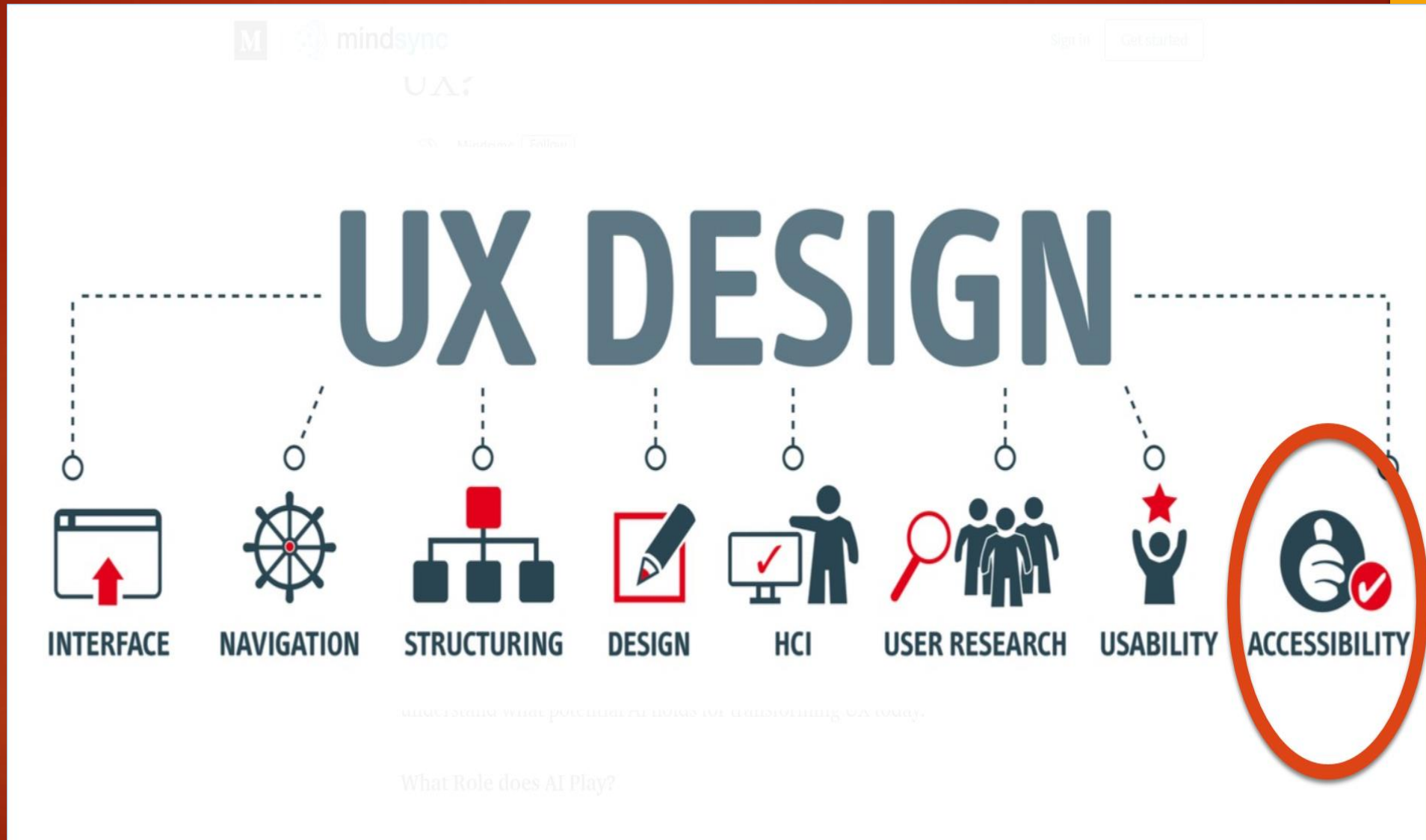
# How does it help? Lawsuits on the rise



# How does it help? Help with SEO



# How does it help? Helps the UX





How does it help?

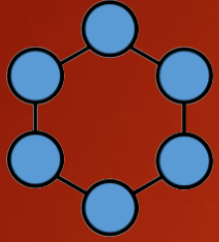
FUTURE PROOF



# Law & Guidelines

Section 508

WCAG 2.1



World wide Web **Consortium** (W3C)



Web Accessibility **Initiative** (WAI)



Web Accessibility Conformance Guidelines –  
**Working Group** (WCAG-WG)



Web Content Accessibility **Guidelines**  
WCAG 2.1

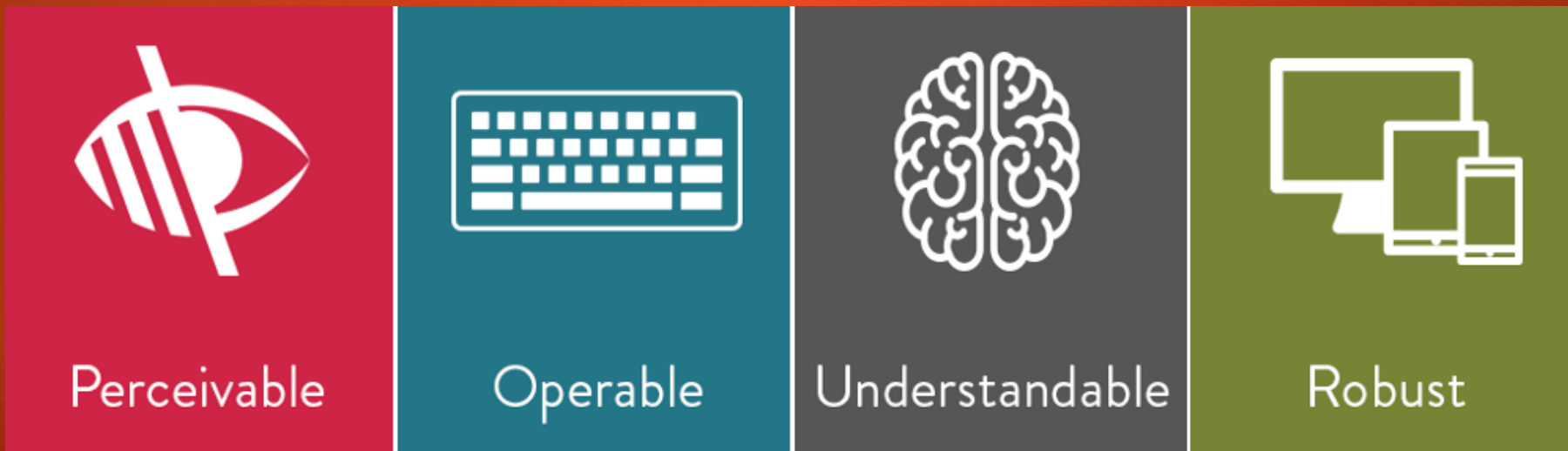
# Section 508

- ▶ 1986 Amendment to Rehabilitation Act of 1973, updated in 2017
- ▶ Targeting websites developed or used by the federal government
- ▶ More information available at [www.section508.gov](http://www.section508.gov)



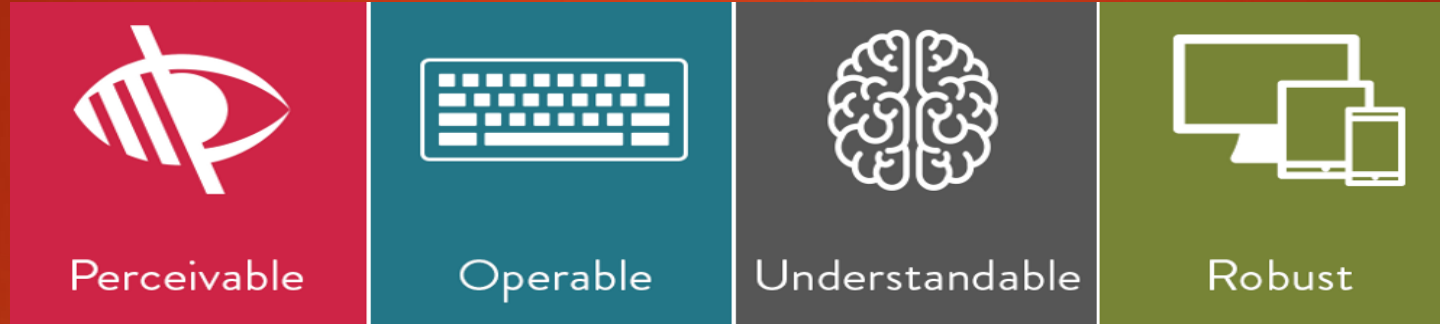
# Web Conformance Accessibility Guidelines (WCAG 2.1)

- ▶ Published in 2018 by the WCAG Working Group (WCAG WG), which is part of the World Wide Web Consortium (W3C) Web Accessibility Initiative (WAI)



# WCAG 2.1

## 4 Principles



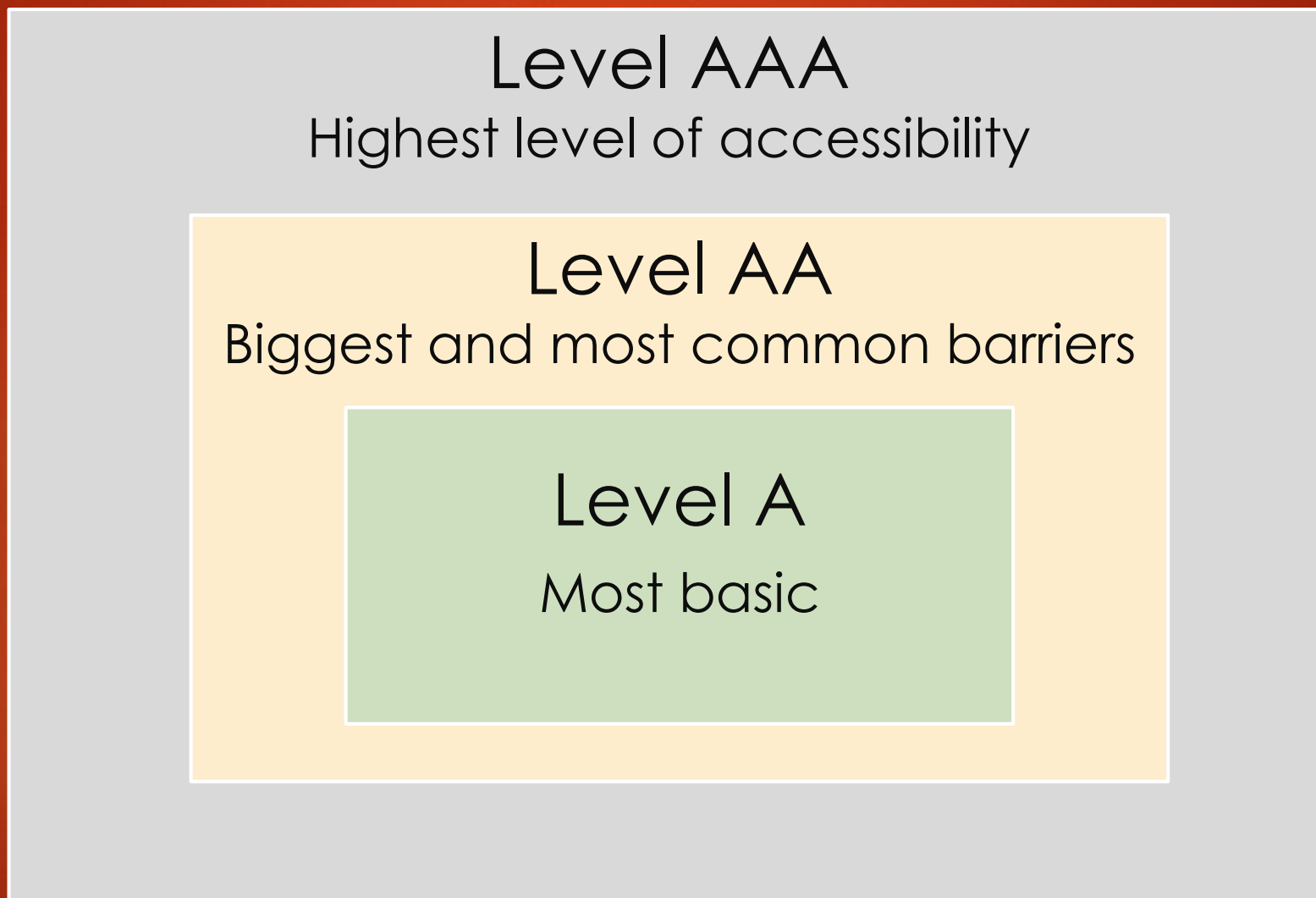
## 13 Guidelines



## 78 Criteria's



# WCAG 2.1 Levels of Conformance



# Let's look at a criteria

## Level A 1.1.1 – Non-text Content

All non-text content that is presented to the user has a text alternative that serves the equivalent purpose.

- ▶ Add a text alternative to all of your images.
- ▶ Add a text alternative to your audio and video (a succinct description of the topic).
- ▶ Add a name to all of your controls (such as 'Search' or 'Submit').

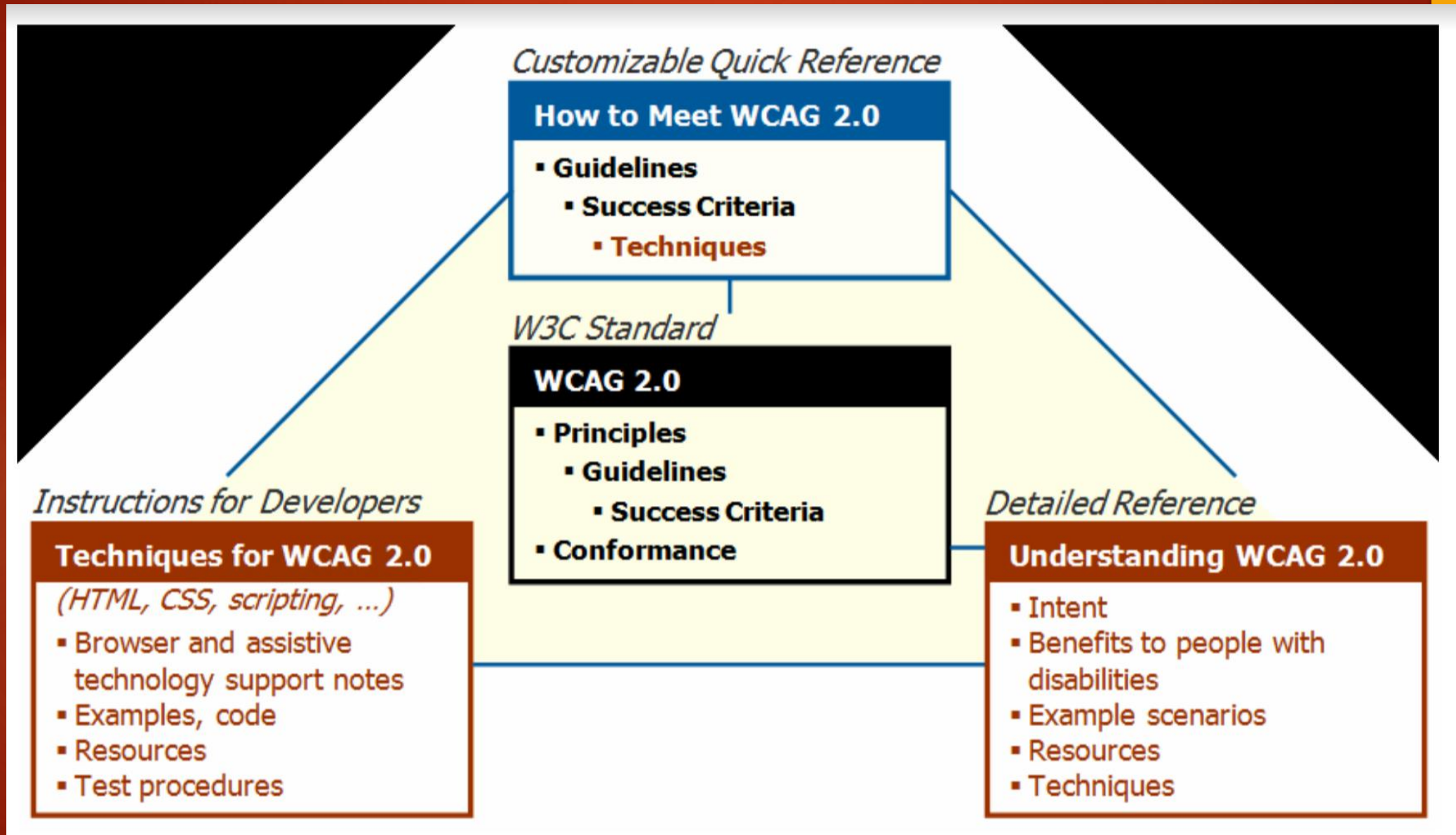


# Let's look at a criteria

## Level A 3.2.2 – On Input

Changing the setting of any user interface component does not automatically cause a change of context unless the user has been advised of the behavior before using the component

# How its structured



# WCAG 2.1 Structure

## Standards/ Guidelines

Standards Overview

### Web Content – WCAG

How to Meet WCAG 2 (Quick  
Reference)

At a Glance

The Documents

New in 2.1

Translations

Applying to Non-Web ICT

## What's New in WCAG 2.1

### Summary

This page lists the new success criteria in Web Content Accessibility Guidelines (WCAG) 2.1.

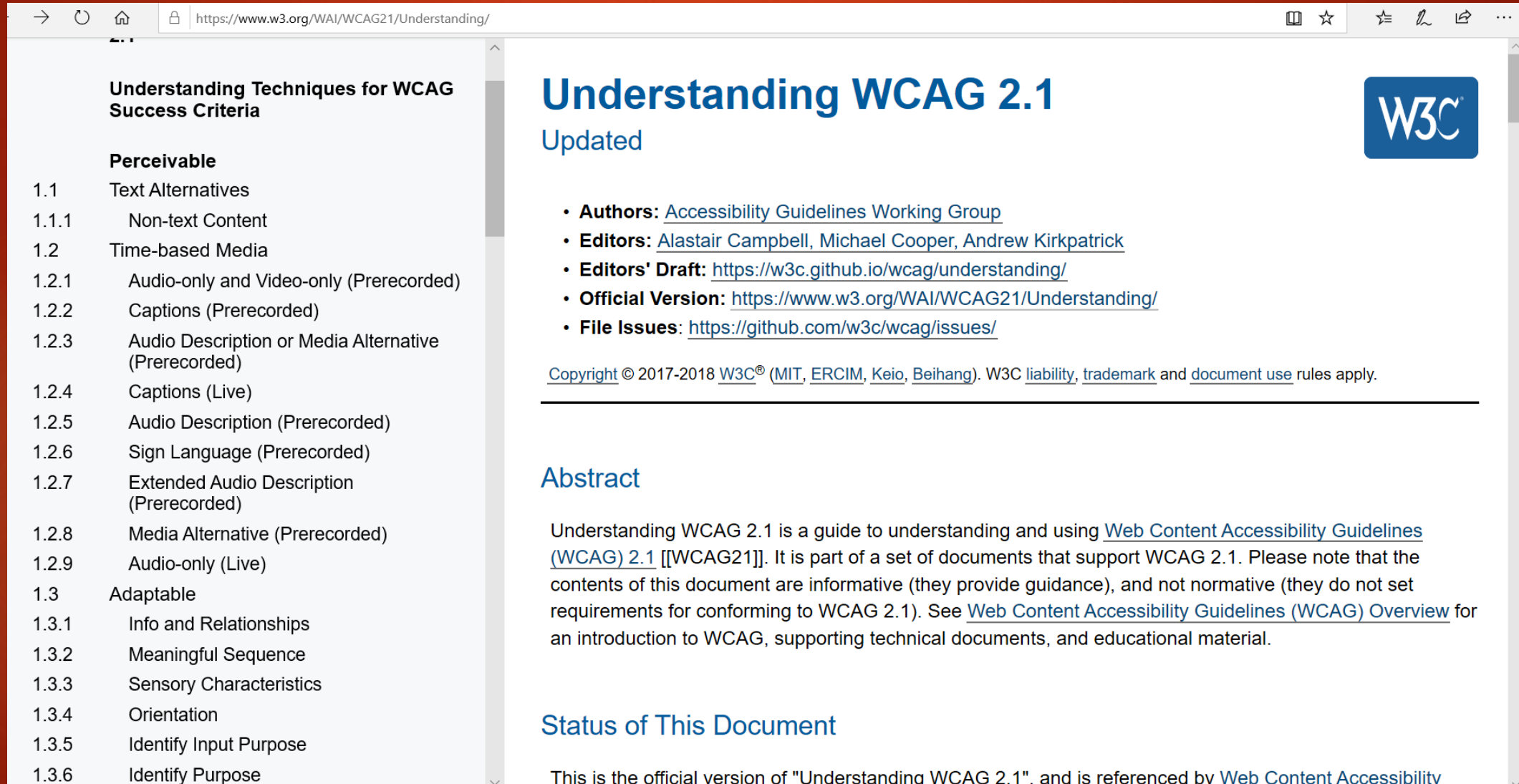
**It includes quotes from personas (fictional people)** to help you understand some aspects of the success criteria. It also includes links to Understanding documents that explain the success criteria in detail and provide more examples.

### Page Contents

- [Introduction](#)
- [Guideline 1.3 Adaptable](#)
  - [1.3.4 Orientation \(AA\)](#)
  - [1.3.5 Identify Input Purpose \(AA\)](#)
  - [1.3.6 Identify Purpose \(AAA\)](#)
- [Guideline 1.4 Distinguishable](#)
  - [1.4.10 Reflow \(AA\)](#)

# WCAG 2.1 Website

► <https://www.w3.org/WAI/WCAG21/Understanding/>

A screenshot of a web browser displaying the 'Understanding WCAG 2.1' page. The browser's address bar shows the URL 'https://www.w3.org/WAI/WCAG21/Understanding/'. The page has a blue header with the title 'Understanding WCAG 2.1' and the word 'Updated' below it. The W3C logo is in the top right corner. On the left, a sidebar lists 'Understanding Techniques for WCAG Success Criteria' under the 'Perceivable' category, with sub-items 1.1 through 1.3.6. The main content area lists authors, editors, draft version, official version, and file issues, all with links. A copyright notice is below this list. An 'Abstract' section follows, explaining the document's purpose. A 'Status of This Document' section is at the bottom, stating it's the official version.

→ ↻ 🏠 🔒 <https://www.w3.org/WAI/WCAG21/Understanding/> 📖 ☆ ⚙️ 🔍 📄 ⋮


## Understanding Techniques for WCAG Success Criteria

### Perceivable

- 1.1 Text Alternatives
  - 1.1.1 Non-text Content
- 1.2 Time-based Media
  - 1.2.1 Audio-only and Video-only (Prerecorded)
  - 1.2.2 Captions (Prerecorded)
  - 1.2.3 Audio Description or Media Alternative (Prerecorded)
  - 1.2.4 Captions (Live)
  - 1.2.5 Audio Description (Prerecorded)
  - 1.2.6 Sign Language (Prerecorded)
  - 1.2.7 Extended Audio Description (Prerecorded)
  - 1.2.8 Media Alternative (Prerecorded)
  - 1.2.9 Audio-only (Live)
- 1.3 Adaptable
  - 1.3.1 Info and Relationships
  - 1.3.2 Meaningful Sequence
  - 1.3.3 Sensory Characteristics
  - 1.3.4 Orientation
  - 1.3.5 Identify Input Purpose
  - 1.3.6 Identify Purpose

## Understanding WCAG 2.1

Updated



- **Authors:** [Accessibility Guidelines Working Group](#)
- **Editors:** [Alastair Campbell](#), [Michael Cooper](#), [Andrew Kirkpatrick](#)
- **Editors' Draft:** <https://w3c.github.io/wcag/understanding/>
- **Official Version:** <https://www.w3.org/WAI/WCAG21/Understanding/>
- **File Issues:** <https://github.com/w3c/wcag/issues/>

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### Abstract

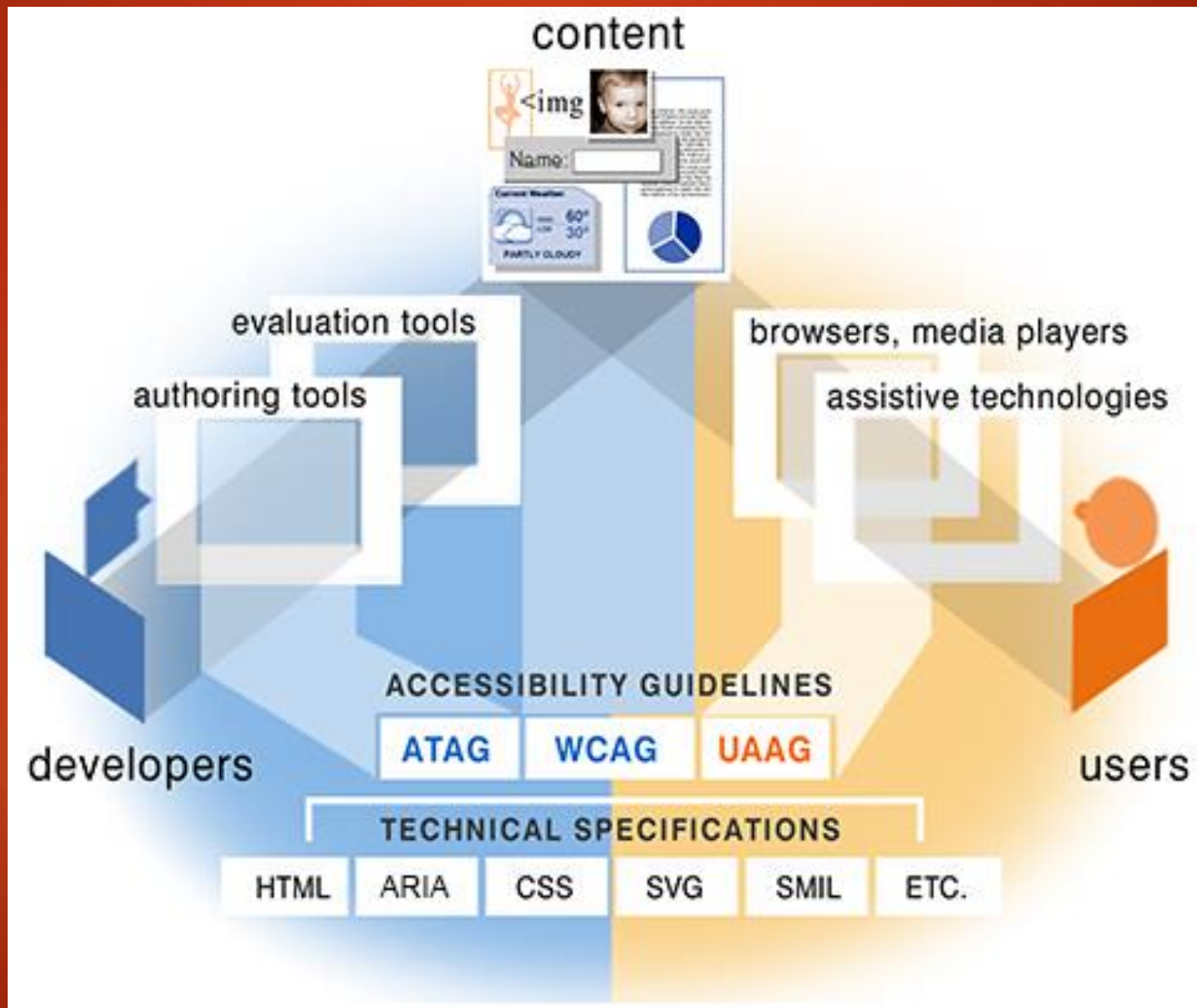
Understanding WCAG 2.1 is a guide to understanding and using [Web Content Accessibility Guidelines \(WCAG\) 2.1](#) [[WCAG21]]. It is part of a set of documents that support WCAG 2.1. Please note that the contents of this document are informative (they provide guidance), and not normative (they do not set requirements for conforming to WCAG 2.1). See [Web Content Accessibility Guidelines \(WCAG\) Overview](#) for an introduction to WCAG, supporting technical documents, and educational material.

### Status of This Document

This is the official version of "Understanding WCAG 2.1", and is referenced by [Web Content Accessibility](#)



# How everything fits together



# Accessibility Testing

# What is Accessibility testing?

Accessibility Testing is defined as a type of Software Testing performed to ensure that the application being tested is usable by people with disabilities like hearing, color blindness, old age and other disadvantaged groups. It is a subset of Usability Testing.



AT: Assistive  
Technologies



# Assistive Technologies help with Accessibility

# What are Assistive Technologies?

Devices and technology that help individuals with disabilities to..

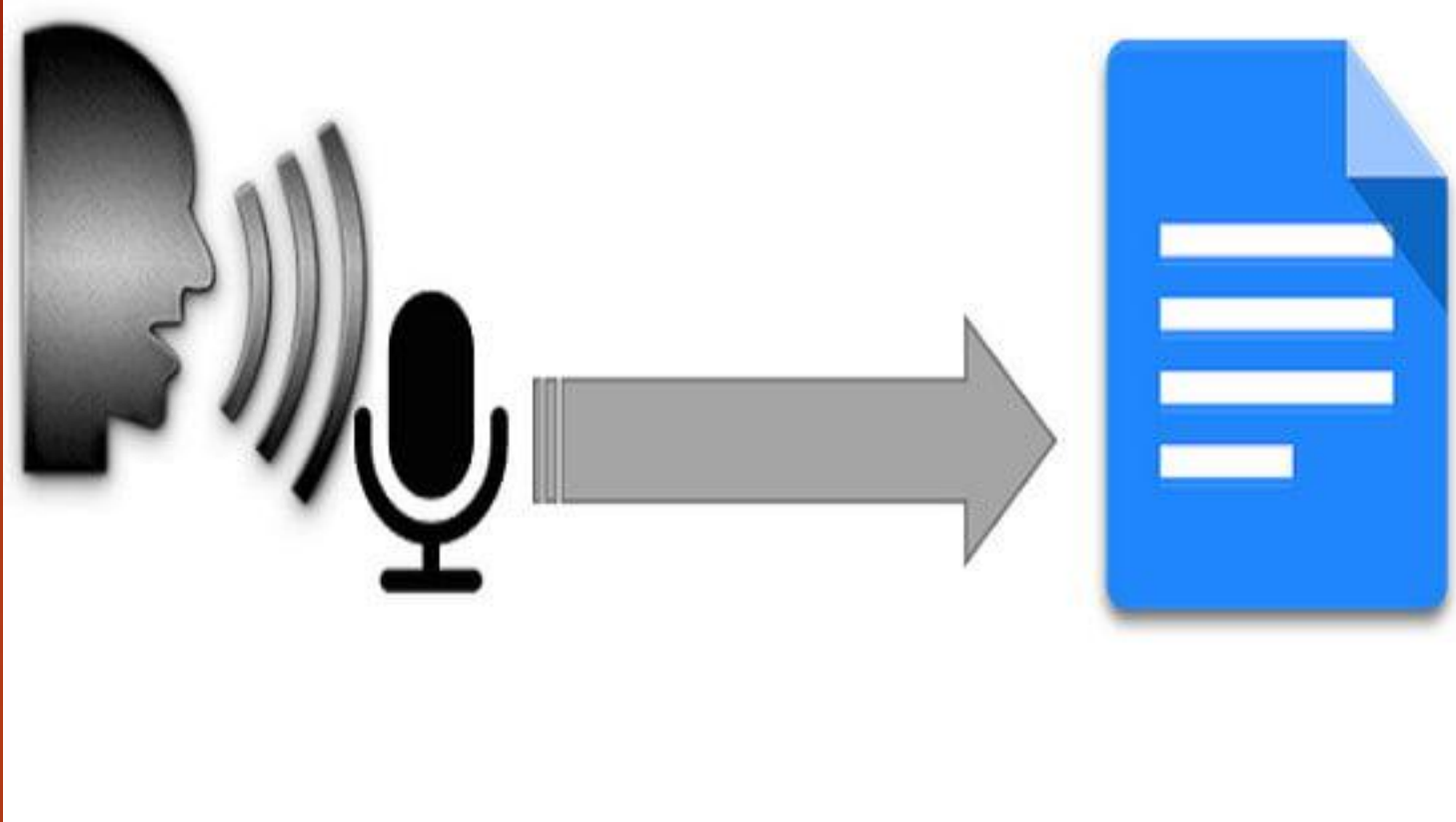




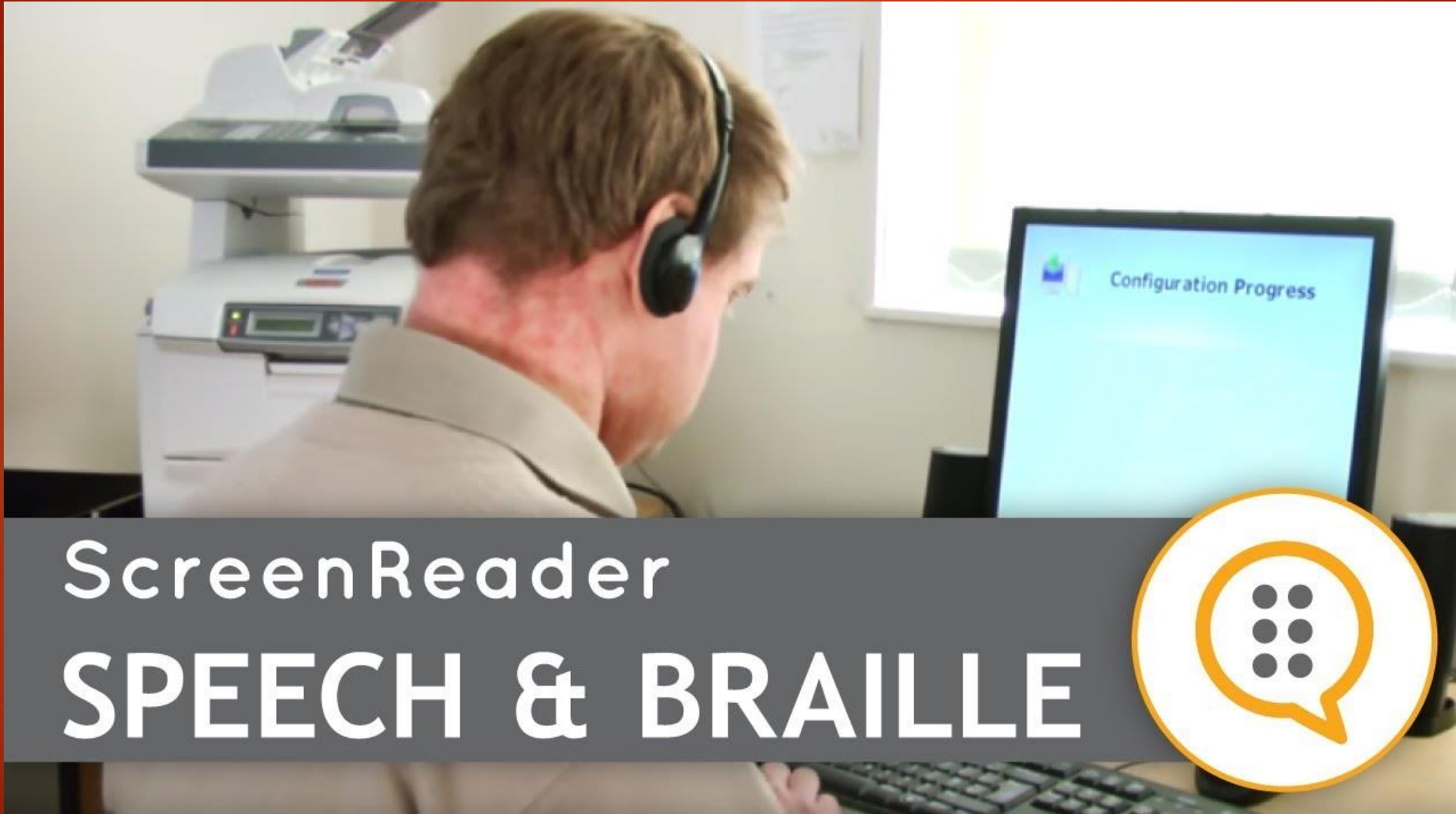
# What are assistive technologies?

- ▶ **Speech Recognition Software** - It will convert the spoken word to text , which serves as input to the computer.
- ▶ **Screen reader software** - Used to read out the text that is displayed on the screen
- ▶ **Screen Magnification Software**- Used to enlarge the monitor and make reading easy for vision-impaired users.
- ▶ **Special keyboard** made for the users for easy typing who have motor control difficulties

# Speech to Text was innovated for Accessibility



# Screen reader Speech and Braille



# Magnifiers in Operating Systems for Zooming





# Special keyboard for limited hand movement





# Physical Accessibility



# Digital Accessibility

Same in Digital accessibility most of the times we assume that users are not disabled



# Why Accessibility Testing?

# Why Accessibility Testing?

Reason 1:  
Cater to Market for Disabled People

A young man with dark hair and a frustrated expression is looking at a smartphone. He is wearing a dark jacket. The background is slightly blurred, showing what appears to be a couch or chair.

## Why Accessibility Testing?

Reason 2:

Abide by Accessibility Legislations

# What are legislations related to Accessibility?

Following are the legal acts by various governments

- ▶ United States: Americans with Disabilities Act - 1990
- ▶ United Kingdom: Disability Discrimination Act - 1995
- ▶ Australia: Disability Discrimination Act - 1992
- ▶ Ireland : Disability Act of 2005

Accessibility Testing is important to ensure legal compliance





# Why Accessibility Testing?

Reason 3:

## Avoid Potential Lawsuits

# Some Lawsuits that were regarding Accessibility

In the past, Fortune 500 companies have been sued because their products were not disabled friendly. Here a few prominent cases

- ▶ National Federation for the Blind (NFB) vs Amazon (2007)
- ▶ Sexton and NFB vs Target (2007)
- ▶ NFB Vs AOL settlement (1999)
- ▶ Recent Domino's

It's best to create products which support disabled and avoid potential lawsuits.

# Which disabilities to support?

## Type of Disability      Disability Description

|                      |  |
|----------------------|--|
| Vision Disability    | <ul style="list-style-type: none"><li>•Complete Blindness or Color Blindness or Poor Vision</li><li>•Visual problems like visual strobe and flashing effect problems</li></ul> |
| Physical Disability  | <ul style="list-style-type: none"><li>•Not able to use the mouse or keyboard with one hand.</li><li>•Poor motor skills like hand movements and muscle slowness</li></ul>       |
| Cognitive disability | <ul style="list-style-type: none"><li>•Learning Difficulties or Poor Memory or not able to understand more complex scenarios</li></ul>   |
| Literacy Disability  | <ul style="list-style-type: none"><li>•Reading Problems</li></ul>  |
| Hearing Disability   | <ul style="list-style-type: none"><li>•Auditory problems like deafness and hearing impairments</li><li>•Cannot able to hear or not able to hear clearly</li></ul>              |



# Video : NVDA for Word

<https://www.criterion508.com/accessibility>

Introduction to WCAG Accessibility

# Disabilities & Barriers to Accessibility: Screen Readers

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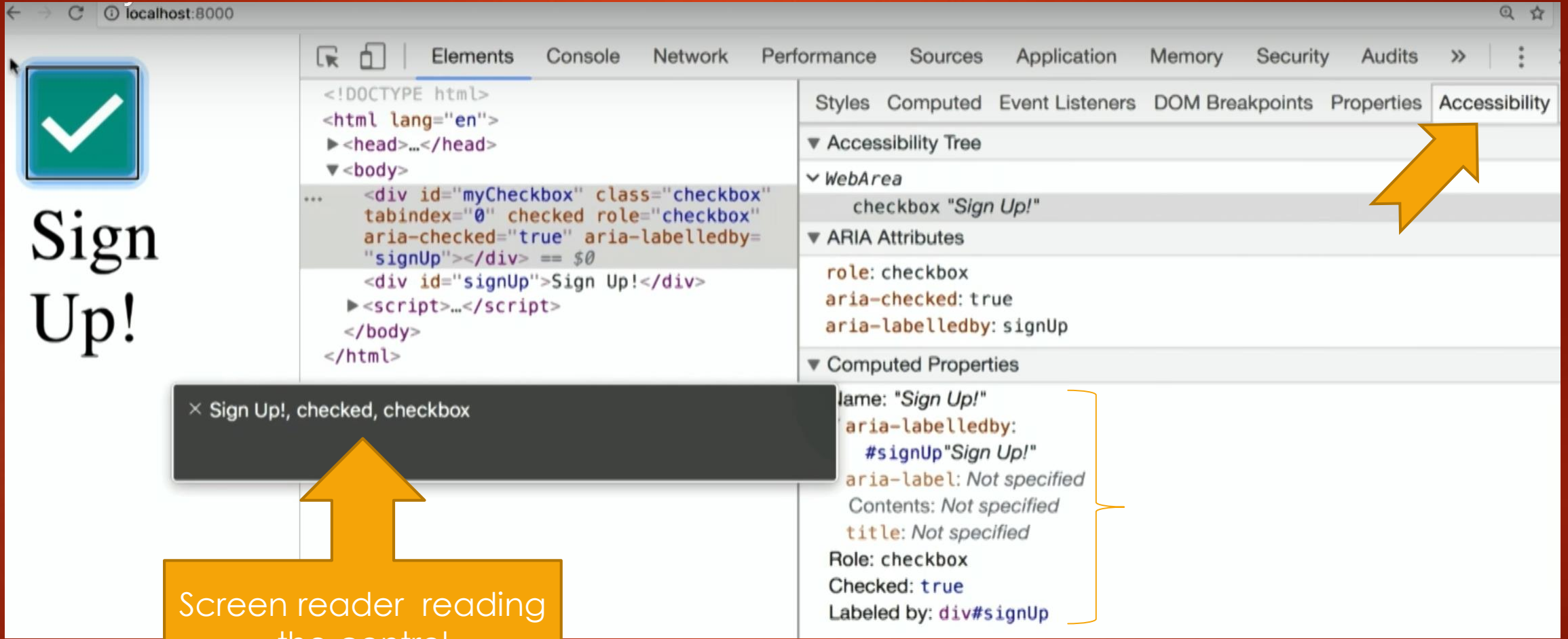


# Accessibility Testing Tools

1. WAVE
2. TAW
3. Accessibility Valet
4. Accessibility Dev Tool
5. Quick A11y Page Tester
6. aDesigner
7. WebAnywhere
8. Web Accessibility Toolbar



# Chrome Dev Tools Accessibility Tab



The screenshot displays the Chrome DevTools Accessibility Tab for a web page at localhost:8000. The page content includes a green checkbox with a white checkmark and the text "Sign Up!". The Accessibility panel on the right shows the "Accessibility Tree" with a "WebArea" containing a "checkbox 'Sign Up!'". Below this, the "ARIA Attributes" section lists: `role: checkbox`, `aria-checked: true`, and `aria-labelledby: signUp`. The "Computed Properties" section lists: `name: "Sign Up!"`, `aria-labelledby: #signUp"Sign Up!"`, `aria-label: Not specified`, `Contents: Not specified`, `title: Not specified`, `Role: checkbox`, `Checked: true`, and `Labeled by: div#signUp`. A yellow arrow points from the "Sign Up!" text in the page to the "checkbox 'Sign Up!'" entry in the Accessibility Tree. Another yellow arrow points from a text box at the bottom to the "Sign Up!, checked, checkbox" label in the Accessibility panel. A third yellow arrow points from the "Sign Up!" text in the page to the "aria-labelledby: #signUp"Sign Up!" property in the Computed Properties section.

Sign Up!

Sign Up!, checked, checkbox

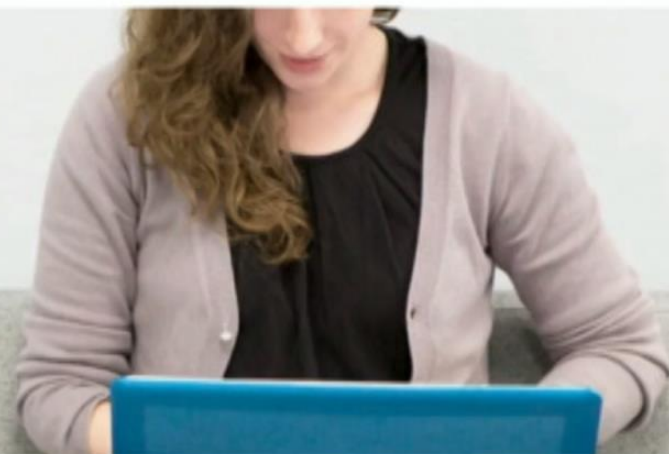
Screen reader reading the control



Introduction to Web Accessibility



WebAIM Training



# We have web accessibility in mind

*Our mission is to empower organizations to make their web content accessible to people with disabilities.*

## Accessibility Training



Whether here in Utah or on-site at your organization, WebAIM can provide comprehensive training to fit your needs.

## Accessible Site Certification



As a respected third party accessibility expert, WebAIM can evaluate and certify your site to established web accessibility guidelines.

## Community

WebAIM Blog

Newsletter

E-mail Discussion List

## Technical Assistance

Need assistance implementing accessibility?

We can provide reports to help you know how

× VoiceOver on Chrome, WebAIM: Web Accessibility In Mind, window, WebAIM: Web Accessibility In Mind, web content has keyboard focus

# Myths of Accessibility Testing

## MYTH

Creating Accessible website is expensive

## FACT

It is not expensive. Take the timeout to think about accessibility issues in the design stage itself along with basic testing .This will save money as well as rework.



# Myths of Accessibility Testing

## MYTH

Changing inaccessible websites to accessible website is time consuming and expensive

## FACT

It is not necessary to incorporate all the changes at one time. Work on basic needs which are most necessary for disabled users.





# Myths of Accessibility Testing

## MYTH

Accessibility is for the Blind and Disabled

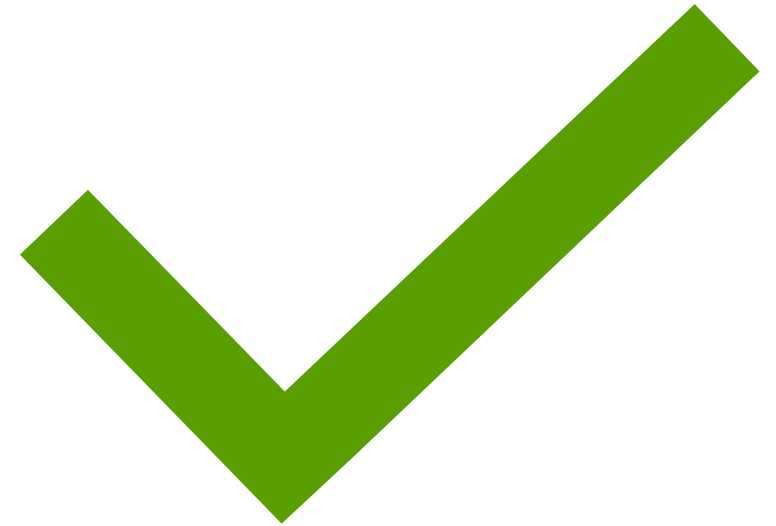
## FACT

Following accessibility guidelines improves the overall usability of the software, which helps regular users as well.



# Conformance Evaluation

- ▶ Determines how well web pages or applications meet accessibility standards.
- ▶ Using W3C's Website Accessibility Conformance Evaluation Methodology (**WCAG-EM**)
- ▶ (WCAG-EM) is an approach for determining conformance to Web Content Accessibility Guidelines (WCAG).



# Accessibility Retrofit Process



## Assessment

Conduct detailed level assessment and discovery of the existing accessibility violations. A report is presented regarding the areas of the web application that needs remediations.


## Remediation

Focus on the rapid remediation of the current violations. Come up with strategic and tactical approaches to the challenge. We then implement the necessary code changes with and share the knowledge to your developers.

## Validation

Conduct a thorough testing and validation using different accessibility testing tools, manual testing, assistive technology testing and online tools. Create necessary documentation for future reference.

# Accessibility Conformance Statement

 **Web Accessibility Initiative** **WAI**

Strategies, standards, resources to make the Web accessible to people with disabilities

Get Involved

About W3C WAI

Accessibility Fundamentals

Planning & Policies

Design & Develop

Test & Evaluate

Teach & Advocate

Standards/Guidelines

[Home](#) / [Planning & Policies](#) / [Developing an Accessibility Statement](#) / **Generator Tool**

**Planning & Policies**

Overview

Approaches for Interim Repairs

Planning and Managing Accessibility

Developing an Organizational Policy

**Developing an Accessibility Statement**

**Generator Tool**

Minimal Example

Complete Example

Involving Users for Better Accessibility

## Generate an Accessibility Statement

**How to use this generator tool**


The information that you provide below will generate an accessibility statement that you can download and further refine. None of the fields are required. None of the information you enter is stored outside your web browser.

**Page Contents**

- [Basic information](#)
- [Your efforts](#)
- [Technical information](#)
- [Approval and complaints process](#)

+ Expand All Sections

- Collapse All Sections

Show all additional Information 

# Accessibility Statement for Website

## Example of Complete Accessibility Statement

Example of an accessibility statement including all parts of the generator tool

### Accessibility Statement for Citylights WebStore

Citylights Inc. is committed to ensuring digital accessibility for people with disabilities. We are continually improving the user experience for everyone, and applying the relevant accessibility standards.

#### Measures to support accessibility

Citylights Inc. takes the following measures to ensure accessibility of Citylights WebStore:

- Include accessibility as part of our mission statement.
- Integrate accessibility into our procurement practices.
- Appoint an accessibility officer and/or ombudsperson.
- Provide continual accessibility training for our staff.
- Include people with disabilities in our design personas.

#### Conformance status

The [Web Content Accessibility Guidelines \(WCAG\)](#) defines requirements for designers and developers to improve accessibility for people with disabilities. It defines three levels of conformance: Level A, Level AA, and Level AAA. Citylights WebStore is partially conformant with WCAG 2.1 level AA. Partially conformant means that some parts of the content do not fully conform to the accessibility standard.

#### Additional accessibility considerations

[↑ Back to Top](#)



# Advocate for the Accessibility Compliance

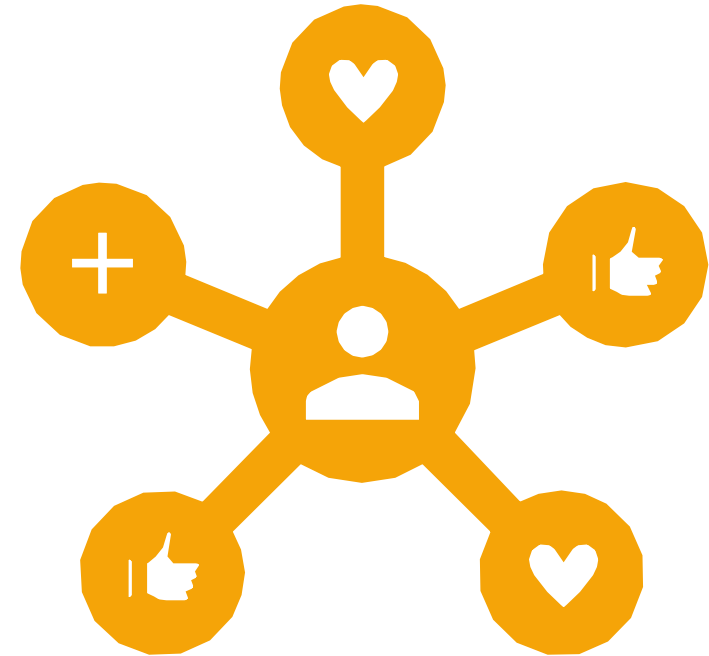
Help your organization and clients implement accessibility for the public sites/applications.

Learn yourselves and implement on projects/programs.

Teach others, share the knowledge, experience and learning

Potential new source of revenue to your organization

## Action Items



# Agilethought

Human Potential, Digitally Delivered



HARISH BEERAM