

Building accessible web applications: What, Why, Who and How

Blog post at engineering.leanix.net/blog/web-accessibility/

www.xkons.de

@xkons64

Konstantin Tieber, February 23rd 2022

**Who am I to
talk about this?**



“Web accessibility is about enabling all humans to use web services, regardless of their physical or situational disability”

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

Tim Berners-Lee

Why should you care?

The people / Our customers



The law

BITV 2.0

European Accessibility Act

BGG

Americans with Disabilities Act

+++ Confidential ++ For internal use only +++

5'15"
5'10"
5'05"
5'00"
4'95"
4'90"
4'85"
4'80"
4'75"
4'70"
4'65"
4'60"
4'55"
4'50"
4'45"
4'40"
4'35"
4'30"
4'25"
4'20"
4'15"



New York City PD

Konstantin Tieber

Uses <div>s as buttons

File no: 53431-886

Date: Mar 3, 2012

+++ Confidential ++ For internal use only +++

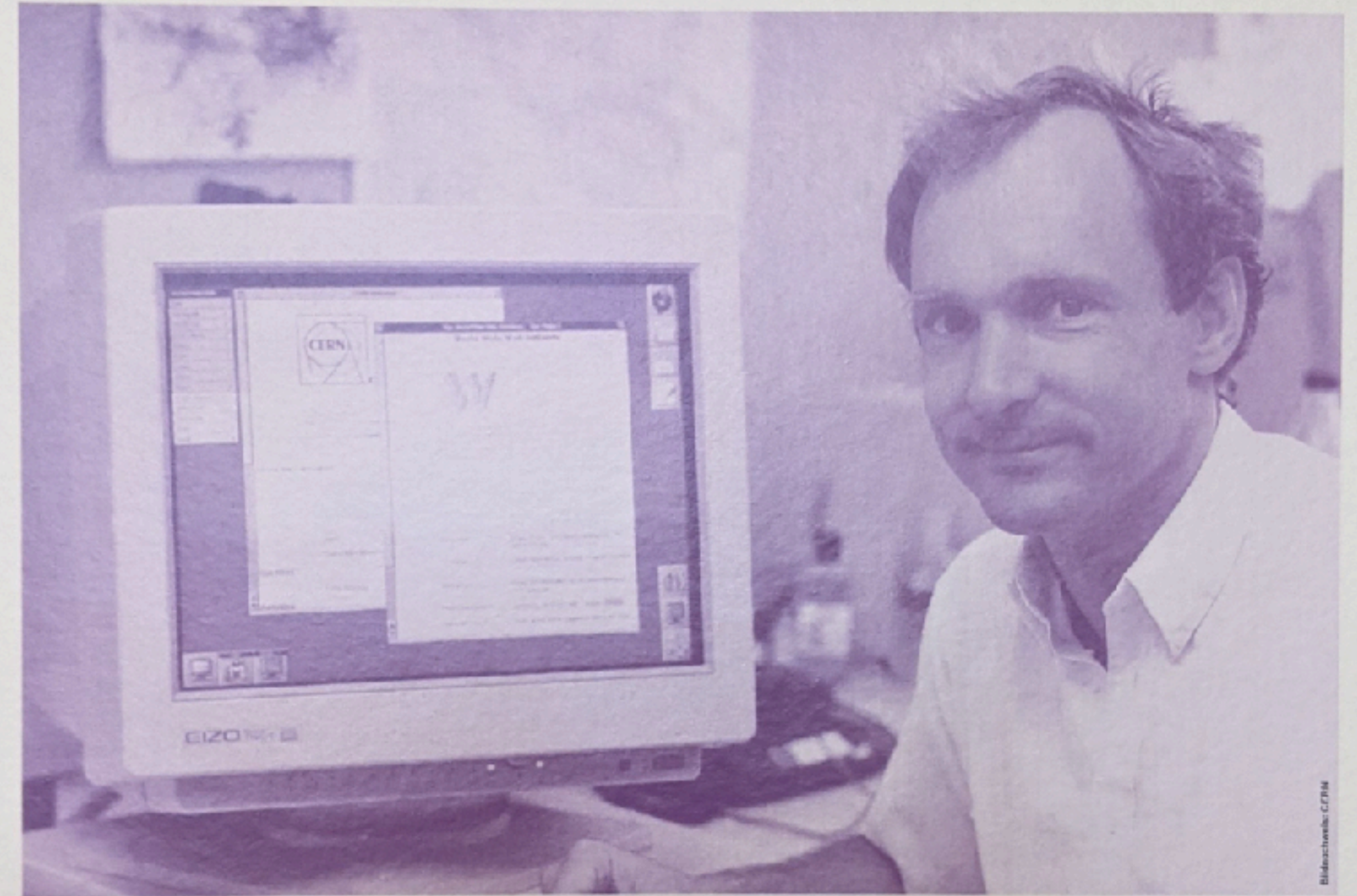
Meet the W3C

Founded in 1994 at MIT

Web Accessibility Initiative (WAI)
publishes the WCAG

w3.org/WAI/standards-guidelines/wcag/

1989



Weltweit erste Internetseite

Am CERN in Genf entwickelt Tim Berners-Lee
die Programmiersprache html.

First internet site worldwide

*At CERN in Geneva, Tim Berners-Lee develops
the html programming language.*

WCAG POUR Principles

Perceivable

This means that users must be able to perceive the information being presented, it can't be invisible to all of their senses.

Operable

This means that users must be able to operate the interface.

The interface cannot require interaction that a user cannot perform.

Understandable

This means that users must be able to understand the information as well as the operation of the user interface.

The content or operation cannot be beyond their understanding.

Robust

This means that users must be able to access the content as technologies advance.

As technologies and user agents evolve, the content should remain accessible.

Disability

Disability emerges where there is a mismatch between individual capacities and environmental demands



Visual

Blindness, low vision, color-blindness



Auditory

Deafness and hard-of-hearing



Motor

Inability to use a mouse, slow response time,
limited fine motor control



Cognitive

Learning disabilities, distractibility,
inability to remember or focus on large
amounts of information



Bedienungshilfen

Bedienungshilfen passen deinen Mac an deine Bedürfnisse an. Du kannst sie nun aktivieren. Dann erhältst du Hilfe bei der Konfiguration und kannst sie in den Systemeinstellungen noch weiter anpassen. Sieh dir an, was jeweils in den unten angezeigten Kategorien verfügbar ist.



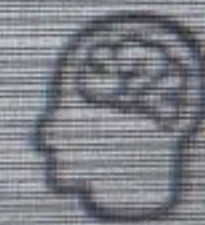
Sehen



Motorik



Hören



Kognitiv

Permanent Temporary Situational

Touch



One arm



Arm injury



New parent

Hear



Deaf



Ear infection



Bartender

See



Blind



Cataract



Distracted driver

Speak



Non-verbal



Laryngitis



Heavy accent

How?

“If an action can be done with a mouse, it needs to be supported via keyboard as well”

Me



checklist

CHECK YOUR WCAG COMPLIANCE

www.a11yproject.com/checklist/

WCAG Quick Reference

www.w3.org/WAI/WCAG21/quickref/

My personal “know in your sleep” a11y list

1. Every form input needs to have a label that can be clearly associated to it. Placeholders are no replacement for labels!
2. Text should have a minimum contrast ratio of 4.5:1 with its background. Strive for at least 7:1. The highest achievable contrast is 21:1, e.g. black on white.
3. Provide alternative text for images that convey information.
4. For keyboard users the element that currently holds the focus should always be identifiable as such.
5. Order your heading tags properly. Don't skip ranks, e.g. from h2 to h4.
6. Buttons that visibly only contain icons need to have an alternative text.

A `<div>` is not a `<button>`!

ARIA what?

Accessible Rich Internet
Applications

twitter.com/mmatuzo/status/1486382377895186438



imgflip.com

A role is a promise

```
<div tabindex="0"  
  (click)="onAction()"  
  (keydown.enter)="onAction()"  
  (keydown.space)="onAction()"  
  [style.cursor]=" 'pointer' "  
  role="button"  
>Click me</div>  
  
<!-- VS -->  
  
<button (click)="onAction()">Click me</button>
```

```
<!-- Reads "button times" -->
<button>&times;</button>

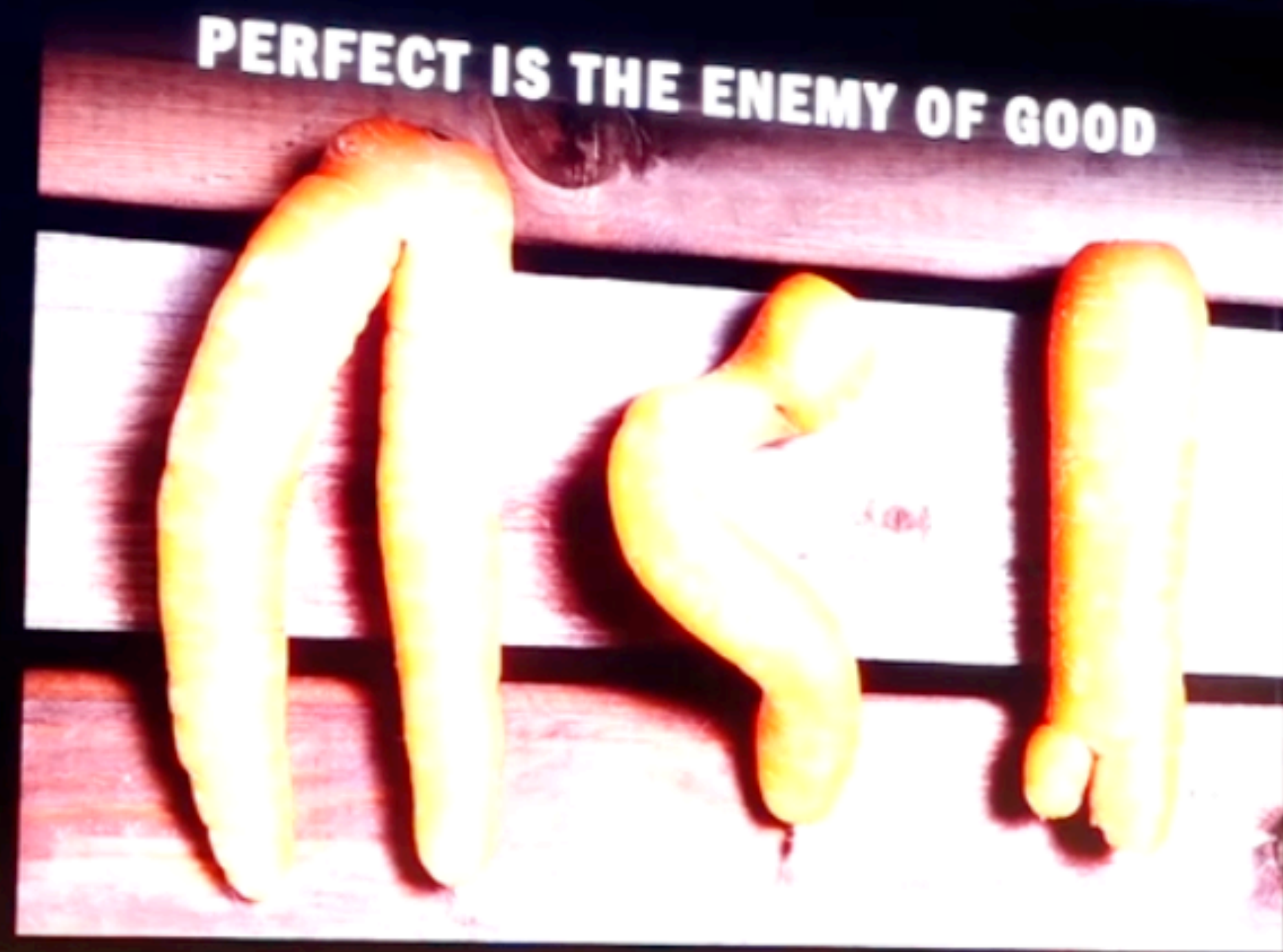
<!-- Reads "button close" -->
<button aria-label="close">&times;</button>

<!-- Reads "button identical to menu" -->
<button>≡ menu</button>

<!-- Reads "button menu" -->
<button><span aria-hidden="true">≡</span> menu</button>
```

Control how screenreaders read your elements

dev.opera.com/articles/ux-accessibility-aria-label/



**Great Talk by Léonie Watson on
screenreaders and accessibility**

[youtube.com/watch?v=qdB8SRhqvFc](https://www.youtube.com/watch?v=qdB8SRhqvFc)

Testing tools



Your keyboard



**Apple VoiceOver
(cmd + f5)**



**Accessibility testing
with affected people
as a service**



**axe DevTools
browser extension**



**Accessibility Insights for
Web browser extension**

... and many more

Demo: axe DevTools

The screenshot displays the axe DevTools interface for a web page at `http://localhost:4200/inventory`. The top header shows the DevTools logo and version `axe-core 4.3.5`, along with `Sign up / Sign in` links. The main dashboard features a large **399** for total issues, a **NEEDS REVIEW** status, and a breakdown: **56** Needs Review, **0** Guided Issues, **9** Critical, **243** Serious, **90** Moderate, and **1** Minor. A `Best Practices: ON` toggle and an `EXPORT` button are also visible.

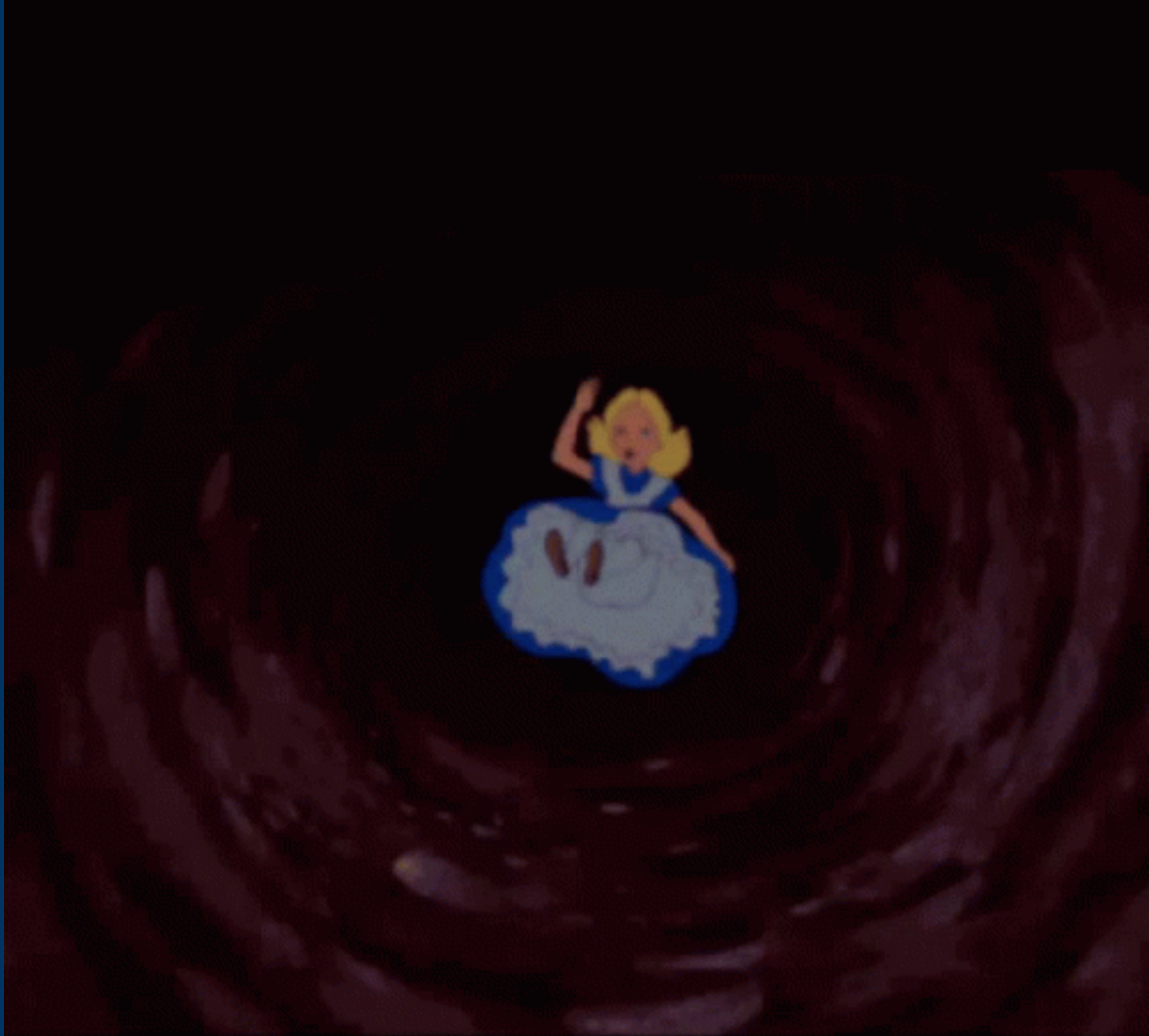
Below the dashboard is a table of all issues:

Issue Description	Count
ARIA input fields must have an accessible name	1
Buttons must have discernible text	9
Elements must have sufficient color contrast	289
Page must have means to bypass repeated blocks	1
Links with the same name must have a similar purpose	8
Document should have one main landmark	1

The selected issue is `Page must have means to bypass repeated blocks`. The element source is shown as:

```
<html lang="en" class="lxShowScrollbar hydrated" style="--lx-navbar-background:url() 0px 0px / 100% auto #d51616; --lx-navbar-f  
ontcolor:#fff; --lx-navbar-backgroundcolor:undefined; --lx-navbartab-backgroundcolorhover:#c02238; --lx-navbartab-fontcolorhove
```

**Accessibility needs
you!**



To conclude

If there's just three things you'll take away from this talk, let it be these:

Web accessibility is cool and helps to make the web more open to anyone.

User interfaces should be designed and built in a way where any user interaction that can be done with a mouse can also be done with a keyboard.

Using semantic HTML elements result in less code and better accessibility out of the box.