POWER TO THE PEOPLE

Freedom For Your Code

Eric Eggert, Knowbility · AccessU · May 2019

Eric Eggert

Eric Eggert is a Web Developer and Teacher who works with Knowbility and the W3C on improving the Web for People with Disabilities, and everyone else.

Web Development

Talking & Planning

Talking & Planning

Graphic Design (of an image of a website)

Talking & Planning

Graphic Design (of an image of a website)

HTML/CSS/JavaScript

Talking & Planning

Graphic Design (of an image of a website)

HTML/CSS/JavaScript

CMS

Talking & Planning

Graphic Design (of an image of a website)

HTML/CSS/JavaScript

CMS

Content

Talking & Planning

Graphic Design (of an image of a website)

HTML/CSS/JavaScript

CMS

Content

- Iterations

Talking & Planning

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Content

Iterations

Performance

Talking & Planning

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HTML/CSS/JavaScript

CMS

Content

Iterations

Hotfixes

Performance

Security

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Iterations

Hotfixes

Performance

Security

Data protection

Talking & Planning

Graphic Design (of an image of a website)

HTML/CSS/JavaScript

CMS

Content

Iterations

Hotfixes

Quality Control

Accessibility

Performance

Security

Data protection

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Iterations

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Quality Control

Accessibility

Performance

Security

Data protection

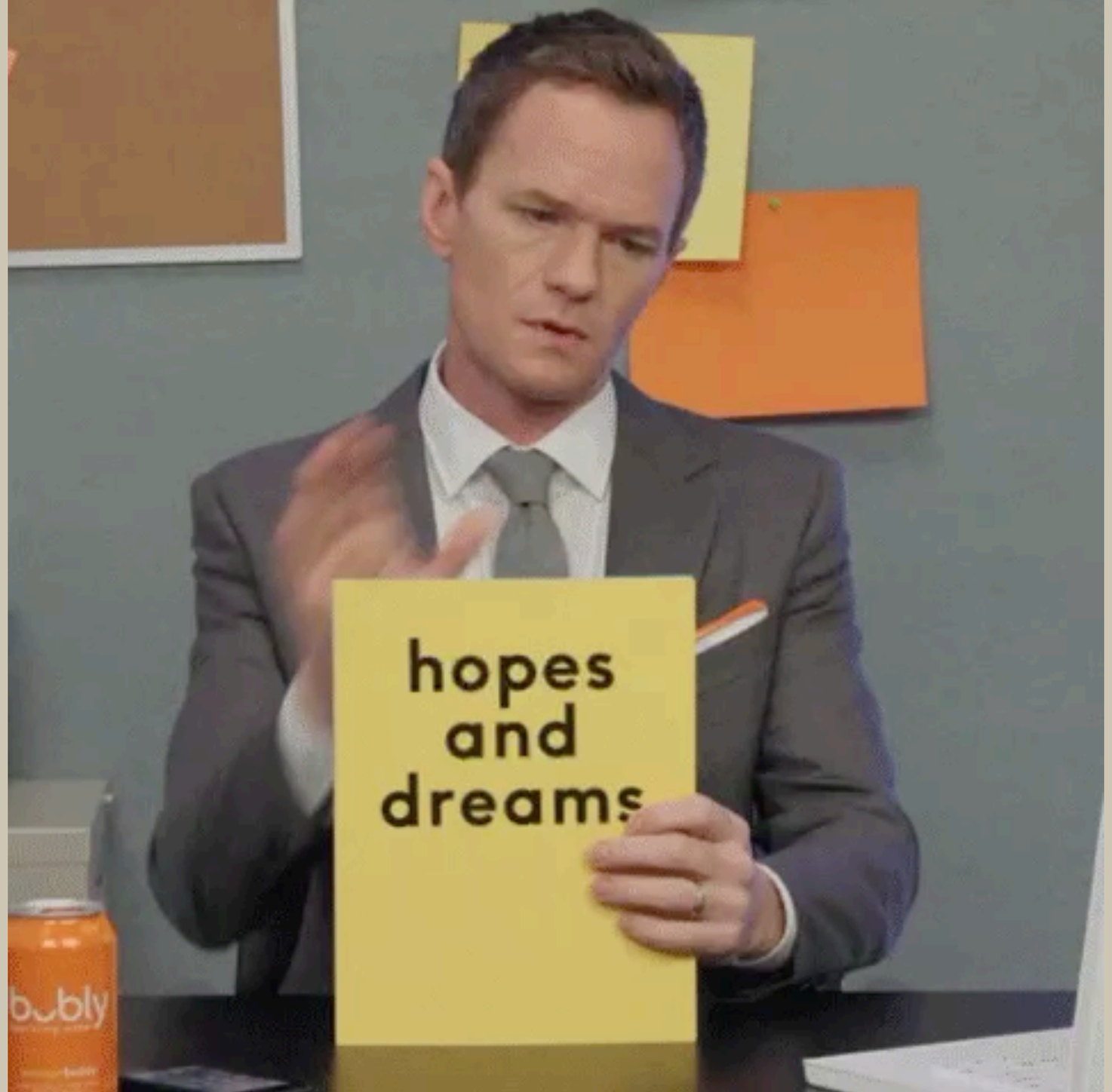
Accessibility
is a sign
of good quality.

“Designing inclusive software results in improved usability and customer satisfaction.”

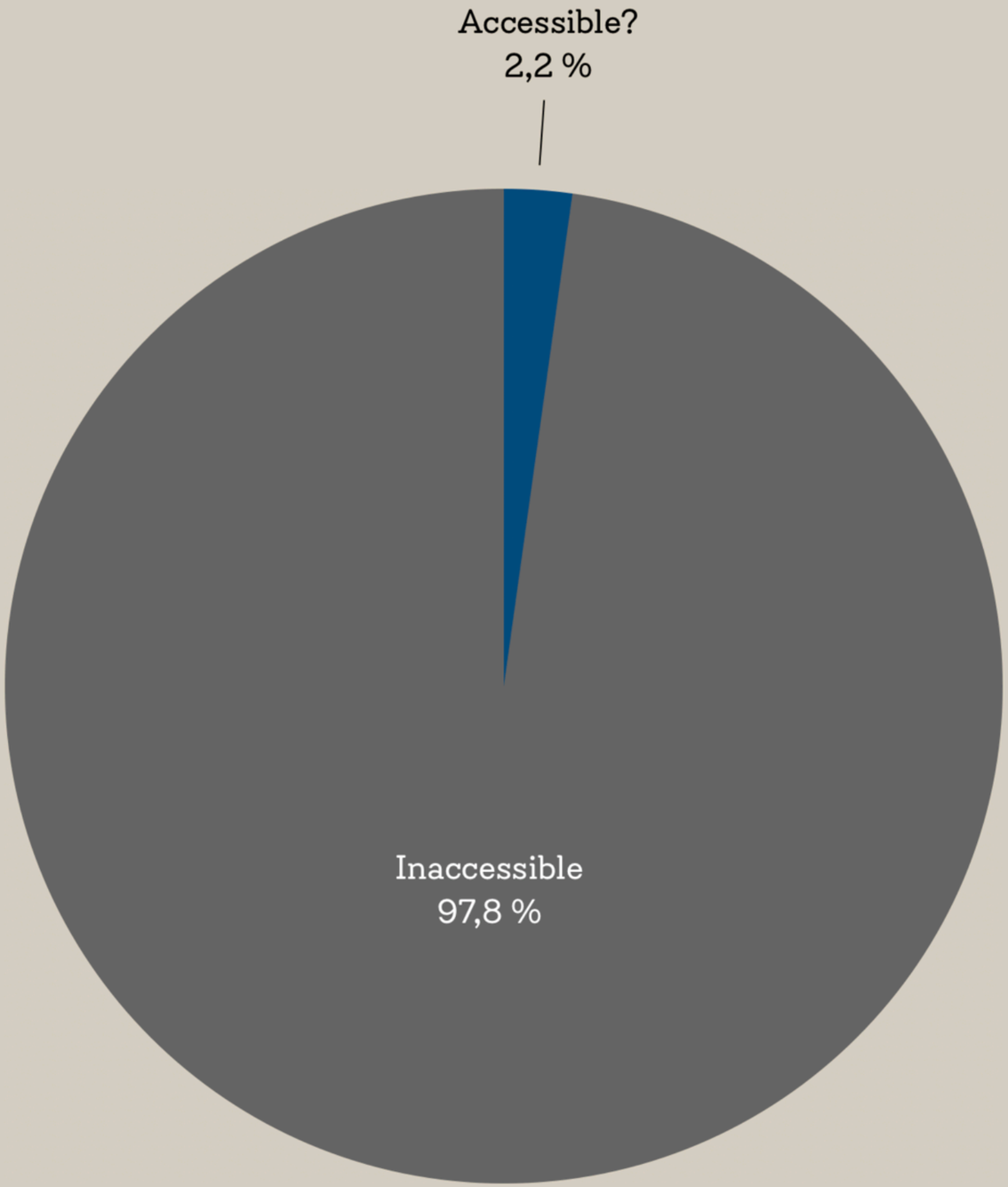
— Microsoft’s app developer guide

Accessibility must be a

^ **foundational** value


hopes
and
dreams
bubly

Accessible Web Development is Complicated



WebAIM Million

Observations

- **60%** of the 1 million home pages had **ARIA present.**
- Home pages **with ARIA** present averaged **11.2 more** detectable **errors** than pages without ARIA.
- Pages with a valid **HTML5 doctype** had significantly **more page elements** (average of 844 vs. 605) **and errors** (average of 61.9 vs. 53.3) than those with other doctypes.
- **2.1M layout tables** were detected compared to only 114k data tables.

More Complex

==

Less Accessible

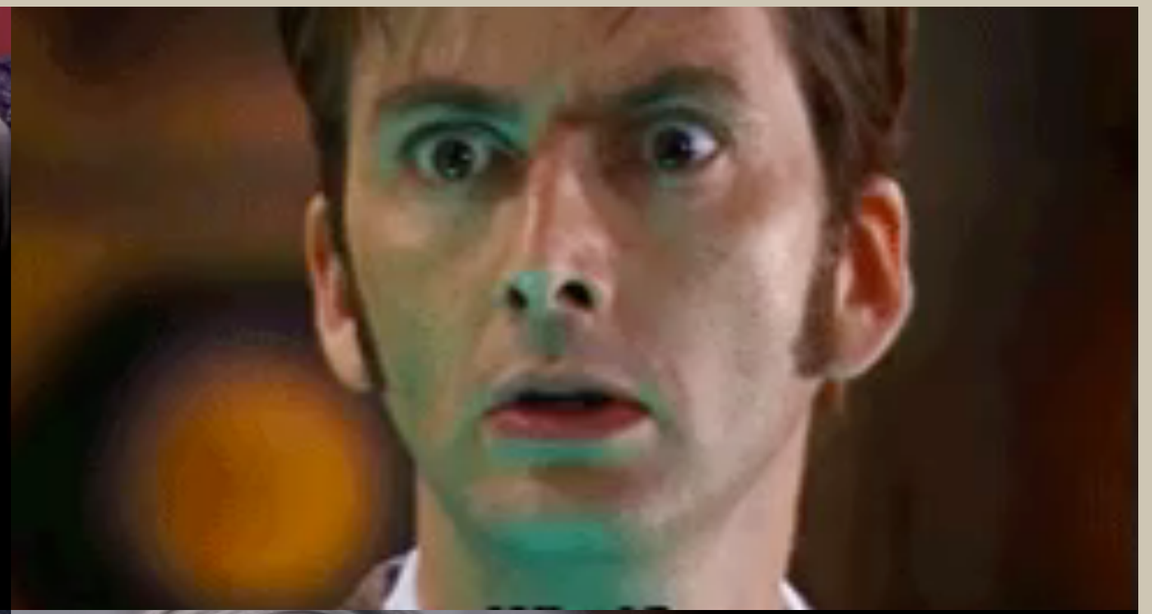
Taming that complexity comes with **more complexity**

I'm too nice.
BBC
AMER
RICA

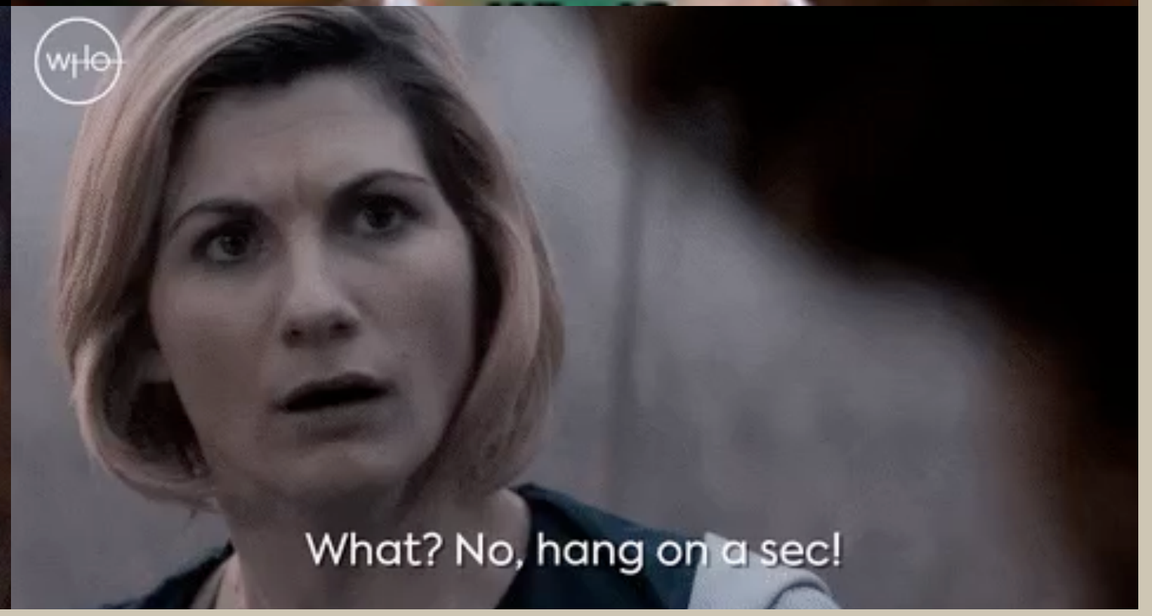
Screen Reader Differences

“VoiceOver and Safari remove list element semantics when list-style: none is used.”

— **Scott O’Hara:** “Fixing” Lists



I'm sorry, what?


What? No, hang on a sec!

“This was a purposeful change due to rampant ‘list’-itis by web developers.”

— James Craig, Apple, bugs.webkit.org

What does it mean for me
as a web developer that
Safari is not reading lists
when they don’t look like a list?

Nothing.

A Time Line

2014: First Commit

2015: Additional Code

...

No Changes

...

2019: The Web Notices

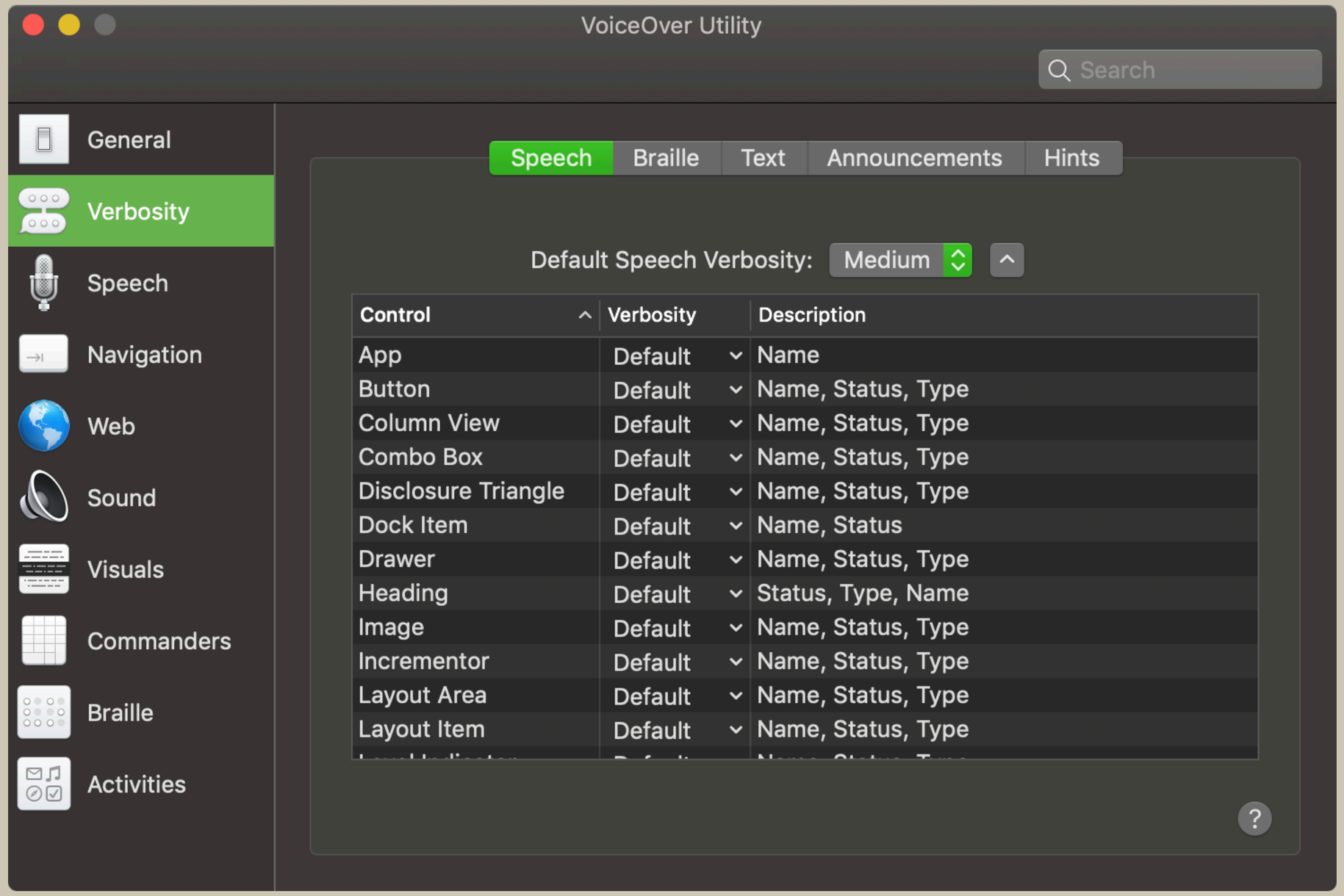
“Customers seem much happier in the 3 years since this change went in.”

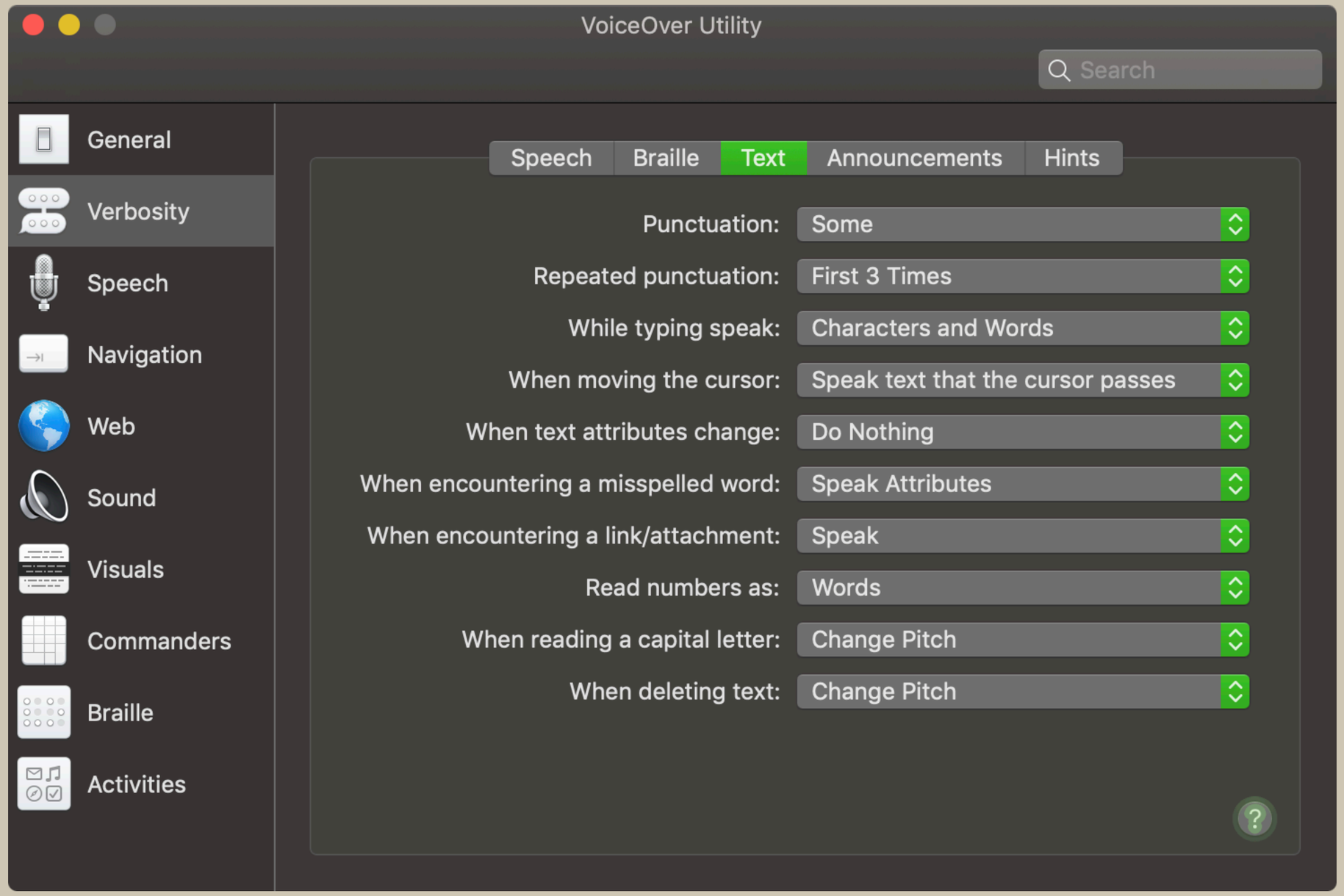
— **James Craig, Apple,** bugs.webkit.org

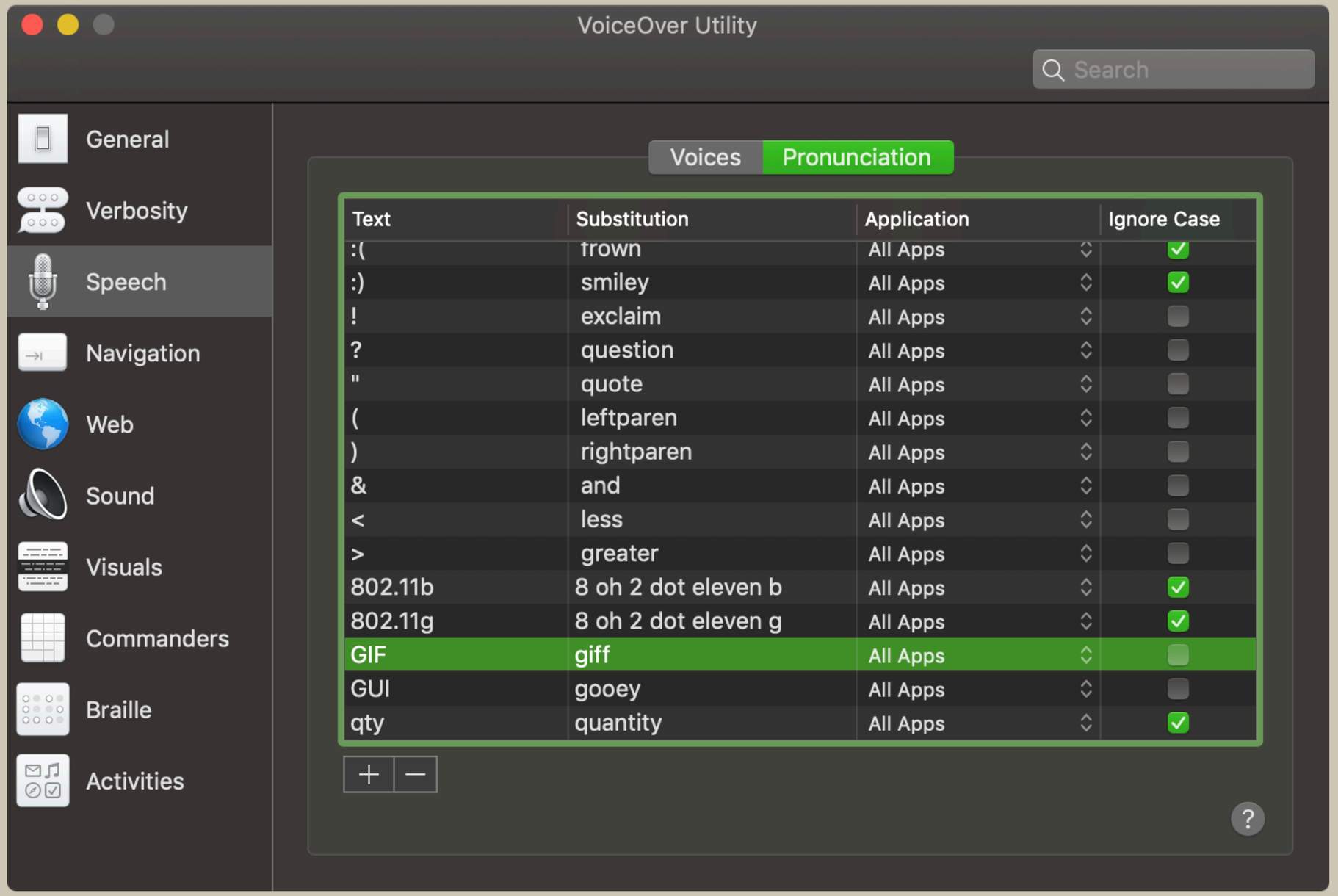
NO!

dowebsitesneedtolookexactlythesameineverybrowser.com

The same it true
for screen readers:
They don’t all need to produce the same output.


VoiceOver Utility
Search
General
Verbosity
Speech
Navigation
Web
Sound
Visuals
Commanders
Braille
Activities
Speech
Braille
Text
Announcements
Hints
Default Speech Verbosity:
Medium
Control
Verbosity
Description
App
Default
Name
Button
Default
Name, Status, Type
Column View
Default
Name, Status, Type
Combo Box
Default
Name, Status, Type
Disclosure Triangle
Default
Name, Status, Type
Dock Item
Default
Name, Status
Drawer
Default
Name, Status, Type
Heading
Default
Status, Type, Name
Image
Default
Name, Status, Type
Incrementor
Default
Name, Status, Type
Layout Area
Default
Name, Status, Type
Layout Item
Default
Name, Status, Type


VoiceOver Utility
Search
General
Verbosity
Speech
Navigation
Web
Sound
Visuals
Commanders
Braille
Activities
Speech
Braille
Text
Announcements
Hints
Punctuation:
Some
Repeated punctuation:
First 3 Times
While typing speak:
Characters and Words
When moving the cursor:
Speak text that the cursor passes
When text attributes change:
Do Nothing
When encountering a misspelled word:
Speak Attributes
When encountering a link/attachment:
Speak
Read numbers as:
Words
When reading a capital letter:
Change Pitch
When deleting text:
Change Pitch


VoiceOver Utility
Search
General
Verbosity
Speech
Navigation
Web
Sound
Visuals
Commanders
Braille
Activities
Voices
Pronunciation
Text
Substitution
Application
Ignore Case
:(
frown
All Apps
:)
smiley
All Apps
!
exclaim
All Apps
?
question
All Apps
"
quote
All Apps
(
leftparen
All Apps
)
rightparen
All Apps
&
and
All Apps
<
less
All Apps
>
greater
All Apps
802.11b
8 oh 2 dot eleven b
All Apps
802.11g
8 oh 2 dot eleven g
All Apps
GIF
giff
All Apps
GUI
gooey
All Apps
qty
quantity
All Apps
+
—
?

There is

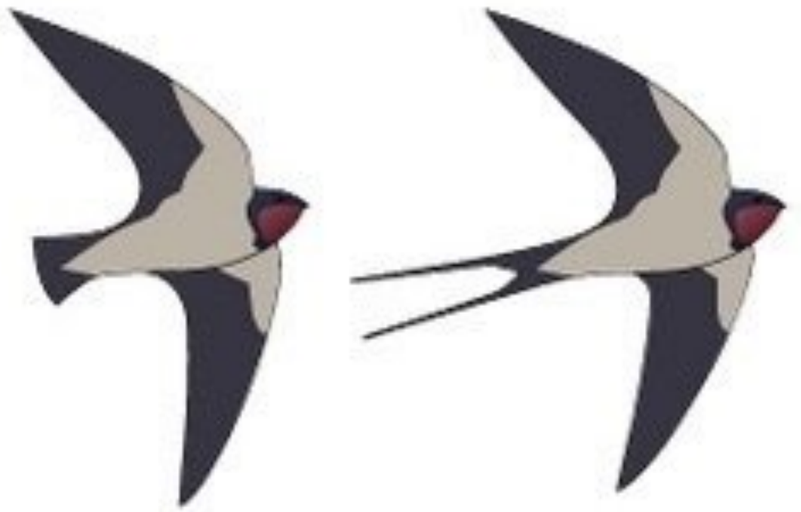
no Control.

Other Differences

Go <figure>

Although 47 of the 74 worldwide swallow species are found in Africa,[1] only two species are named after the continent: the West African Swallow (*Hirundo domicella*) and the South African Swallow (*Hirundo spilodera*), also known as the South African Cave Swallow.

Since the range of the South African Swallow extends only as far north as Zaire,[2] I felt fairly confident that this was the non-migratory African species referred to in previous discussions of the comparative



LEFT: South African Swallow
RIGHT: European Swallow

JAWS has the best support for announcing native figures and their captions, though support is not perfect or consistent **depending on the browser** and JAWS's **verbosity settings**.

IE11 requires the use of role="figure" and an aria-label

or aria-labelledby pointing to the figcaption to mimic native announcements.

Edge[1] won’t announce the presence of a **figure** role at all, regardless if ARIA is used or not.

---

[1] EdgeHTML-Version as published in 2018.

Chrome and Firefox offer similar support,
however **JAWS** (with default verbosity settings)
+ Chrome will completely ignore a figure
(including the content of its figcaption)
if an image has an empty alt
or is lacking an alt attribute.

Testing **NVDA** version 2018.4.1 with IE11, Edge, Firefox 64.0.2 and Chrome 71, there was **no trace of figures.**

```
<figure role="figure" aria-label="Caption for the figure.">
  <!-- figure content. if an image, provide alt text -->
  <figcaption>
    Caption for the figure.
  </figcaption>
</figure>

<!--
  aria-label for macOS VoiceOver + Chrome
  role="figure" for IE11.

  IE11 needs an accessible name (provided by aria-label).
  If not for the fact VO + Chrome doesn't support an
  accessible name from aria-labelledby, that attribute
  would have been preferred / pointed to an ID on
  the <figcaption>.
-->
```

Presently, mobile screen readers won’t announce figures, nor Edge unless paired with Narrator (sort of), or any browser paired with NVDA.

Thanks, Scott![2]

[2] How do you figure? | scottohara.me

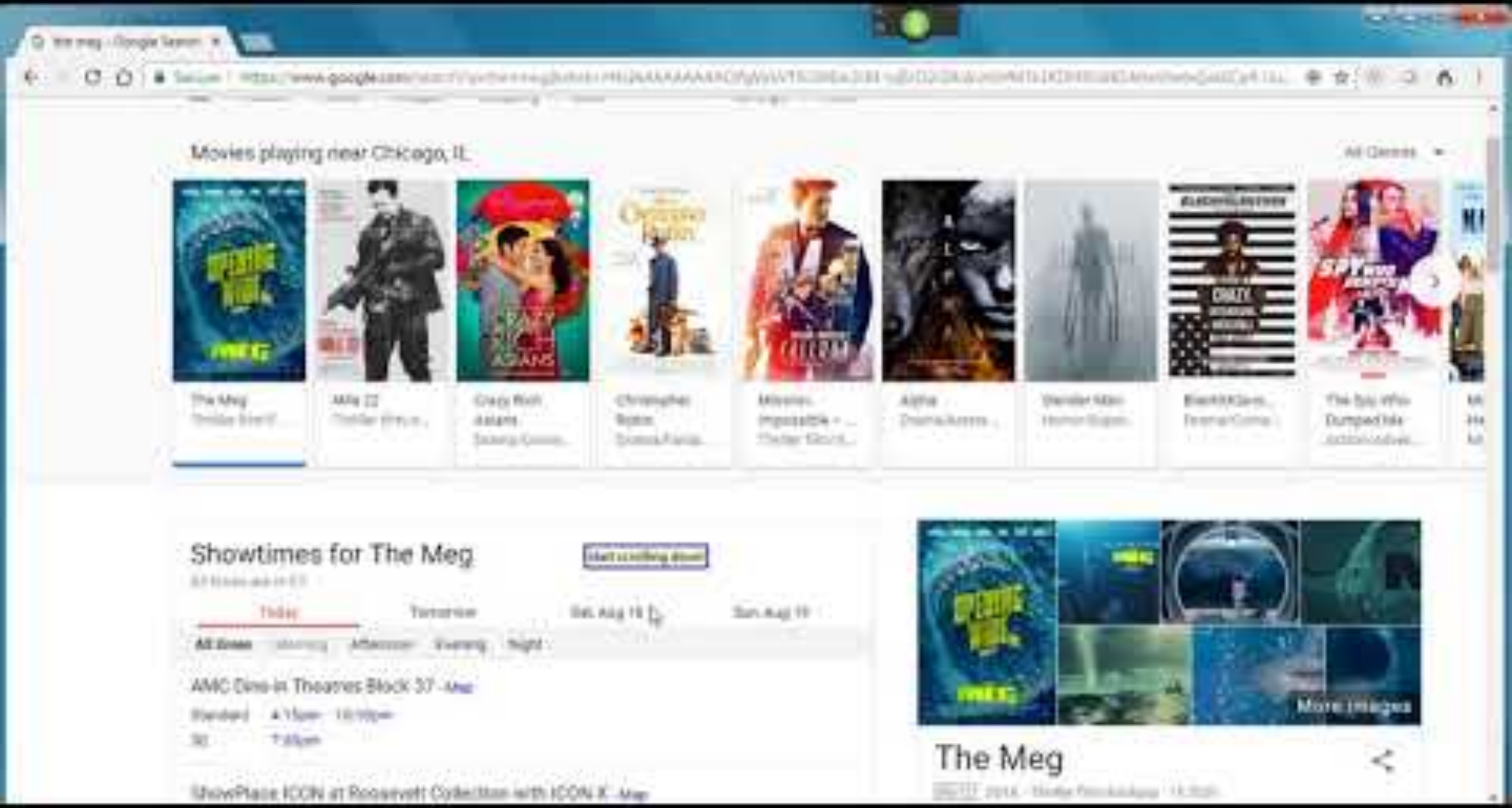
ARIA **can** help,

but not in

every situation.

Accessibility is **not** only Screen Readers

Most non-Screen-Reader assistive technology does not work well with ARIA.


Movies playing near Chicago, IL
All Genres
The Meg
Mile 22
Crazy Rich Asians
Christopher Robin
Mission: Impossible + ...
Alpha
Slender Man
Black Kiss...
The Spy Who Dumped Me
Showtimes for The Meg
Today
Tomorrow
Sat, Aug 18
Sun, Aug 19
All times
Morning
Afternoon
Evening
Night
AMC Dine-in Theatres Block 37 - Map
Standard
4:15pm
10:00pm
3D
7:45pm
ShowPlace ICON at Roosevelt Collection with ICON X - Map
More images
The Meg

Nuance released the lucky version 13 of Dragon Naturally Speaking. I've been doing some preliminary testing and here's what Dragon 13 supports (so far) in terms of ARIA:

- `role="button"`
- `role="link"`
- `role="radio"`
- `role="checkbox"`
- `aria-label`

That's just in about 30 mins of testing, so there's definitely more to test, but this is a huge step.

How Dragon Naturally Speaking works with ARIA » Simply Accessible (2014)

Screen shot courtesy of Eric Bailey

I'm a real link | As am I

I'm a placeholder link (no href)

I'm an ARIA link made out of a div

I'm an ARIA link made out of a button

I'm a paragraph of text with an ARIA link within me. Where I be?

Screen shot courtesy of Eric Bailey.

Normal Button
aria-disabled button
Actually Disabled Button

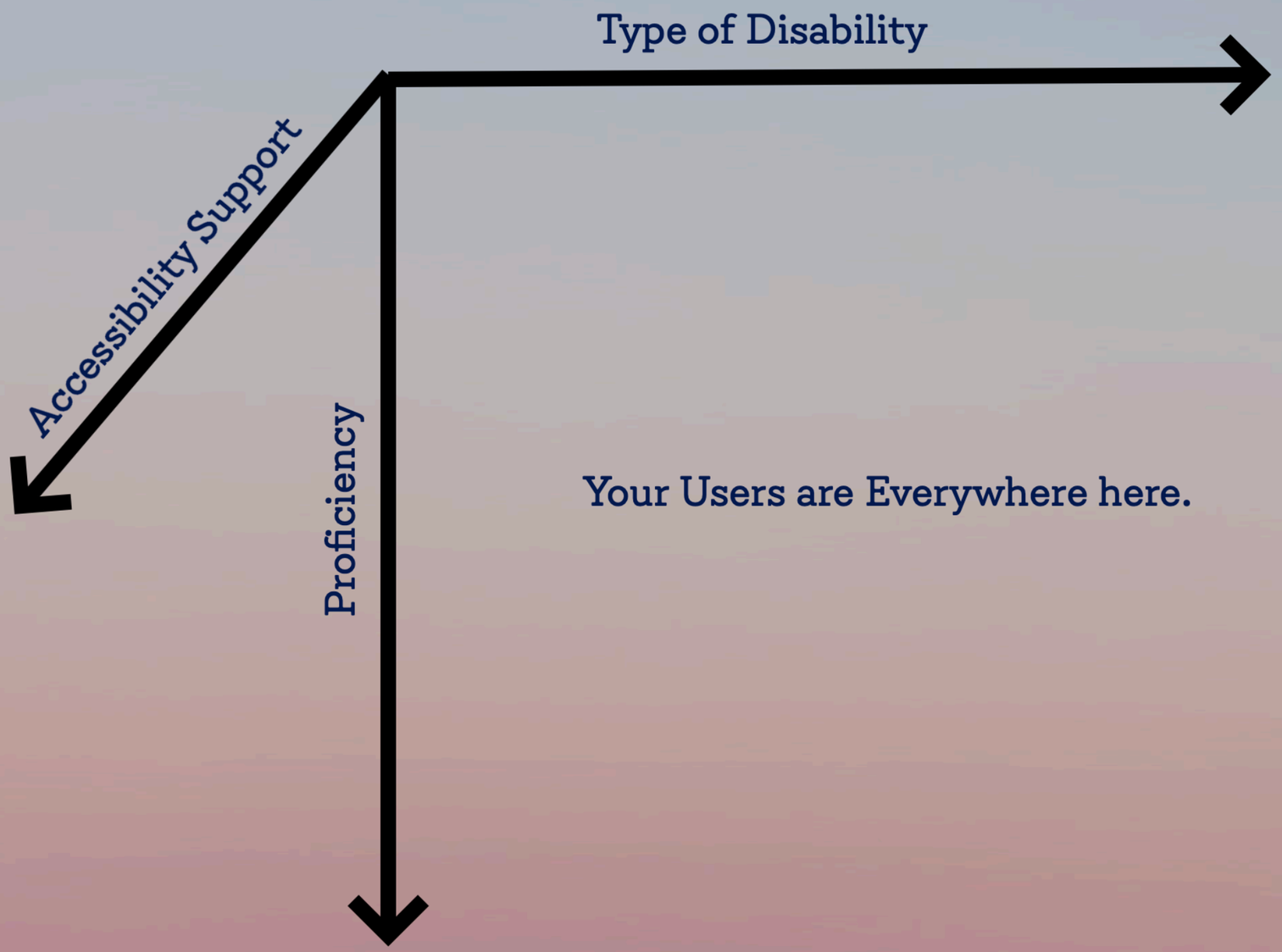
Users!

Knowledge Levels Vary Greatly

Users often don’t know what their computers can do for them.

Other Users hack their assistive technology to work with inaccessible sites.

Some users write
style sheets and JavaScripts
to change websites
to their needs.



Your Users are Everywhere here.

Test with Diverse Users

Give Users Agency

Allow use of assistive technology that suits a particular user’s needs.

Try not to **prescribe** how to use a component.

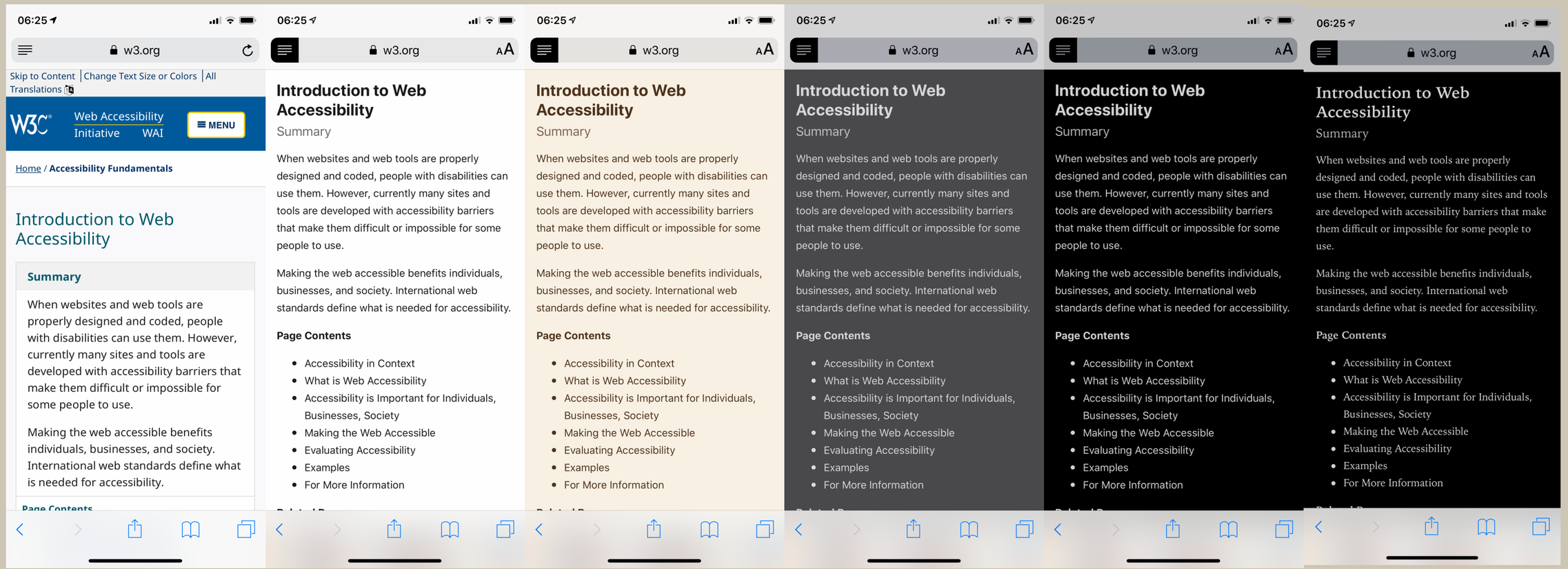
Use HTML & CSS to **describe** elements.

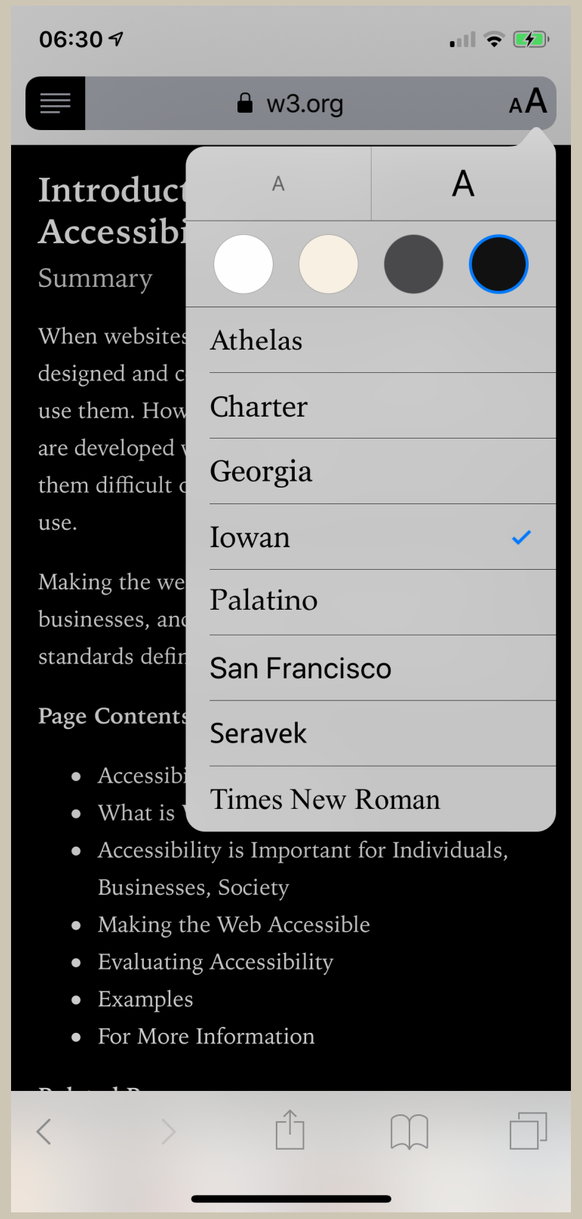
Don’t expect any proficiency from users.

Don’t break conventions!

Users get a lot more tools to use!

Reader Mode


06:25
w3.org
Skip to Content | Change Text Size or Colors | All Translations
Web Accessibility Initiative WAI
MENU
Home / Accessibility Fundamentals
Introduction to Web Accessibility
Summary
When websites and web tools are properly designed and coded, people with disabilities can use them. However, currently many sites and tools are developed with accessibility barriers that make them difficult or impossible for some people to use.
Making the web accessible benefits individuals, businesses, and society. International web standards define what is needed for accessibility.
Page Contents
Introduction to Web Accessibility
Summary
When websites and web tools are properly designed and coded, people with disabilities can use them. However, currently many sites and tools are developed with accessibility barriers that make them difficult or impossible for some people to use.
Making the web accessible benefits individuals, businesses, and society. International web standards define what is needed for accessibility.
Page Contents
Accessibility in Context
What is Web Accessibility
Accessibility is Important for Individuals, Businesses, Society
Making the Web Accessible
Evaluating Accessibility
Examples
For More Information


06:30
w3.org
AA
A
A
Athelas
Charter
Georgia
Iowan
Palatino
San Francisco
Seravek
Times New Roman
Introduct
Accessibi
Summary
When websites
designed and c
use them. How
are developed
them difficult
use.
Making the we
businesses, and
standards defi
Page Contents
Accessibi
What is
Accessibility is Important for Individuals, Businesses, Society
Making the Web Accessible
Evaluating Accessibility
Examples
For More Information

Reader Mode

Native Support:

- Safari (since 2010, can set to default since 2015)
- Firefox (2015)
- Edge (2015)
- Chrome (soon)

w3.org

Introduction to Web Accessibility

w3c_wai

7-9 minutes

Page Contents

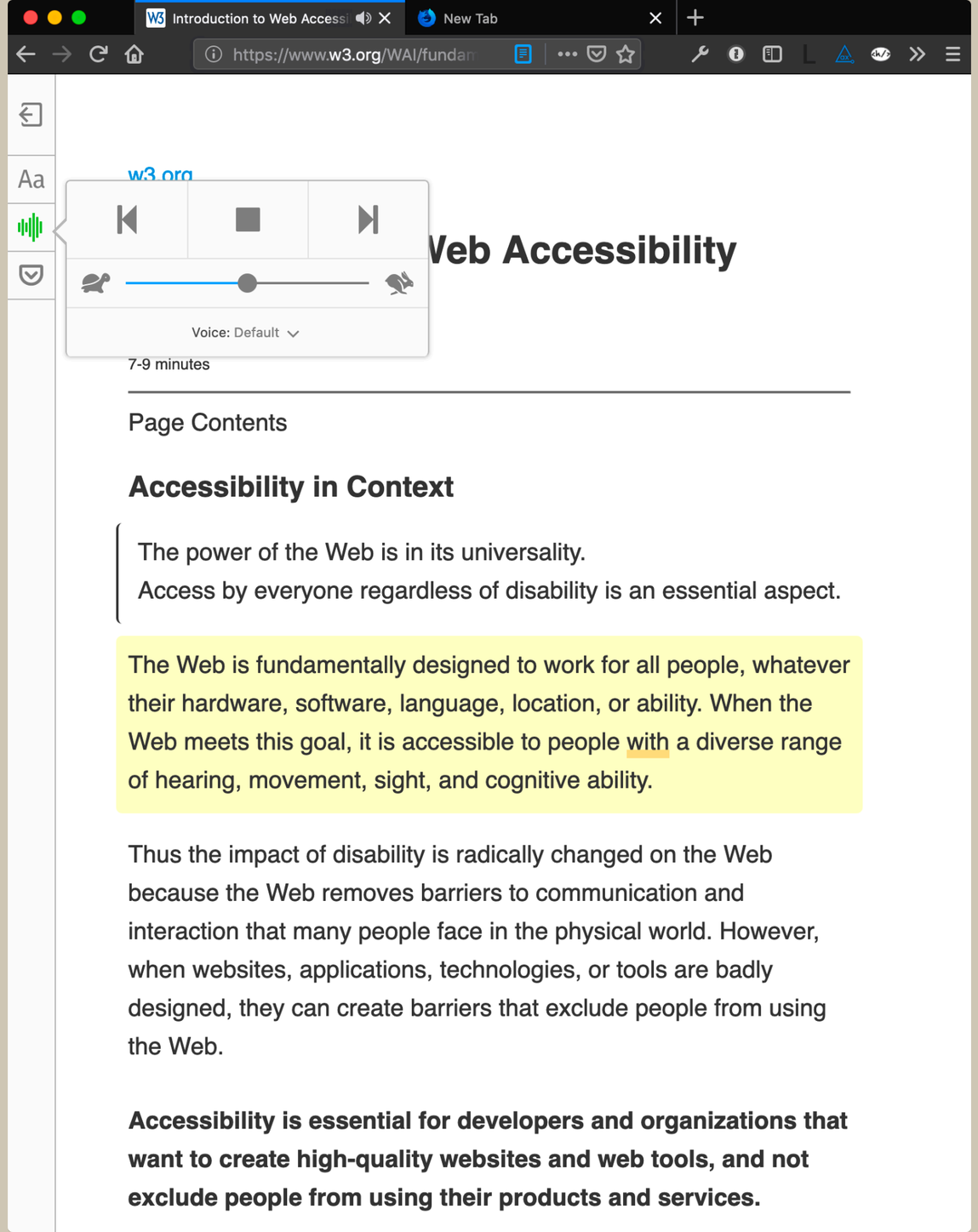
Accessibility in Context

> 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, location, or ability. When the Web meets this goal, it is accessible to people with a diverse range of hearing, movement, sight, and cognitive ability.

Thus the impact of disability is radically changed on the Web because the Web removes barriers to communication and interaction that many people face in the physical world. However, when websites, applications, technologies, or tools are badly designed, they can create barriers that exclude people from using the Web.

Accessibility is essential for developers and organizations that want to create high-quality websites and web tools, and not exclude people from using their products and services.


Introduction to Web Access
New Tab
https://www.w3.org/WAI/fundan
Aa
w3.org
Voice: Default
Web Accessibility
7-9 minutes
Page Contents
Accessibility in Context
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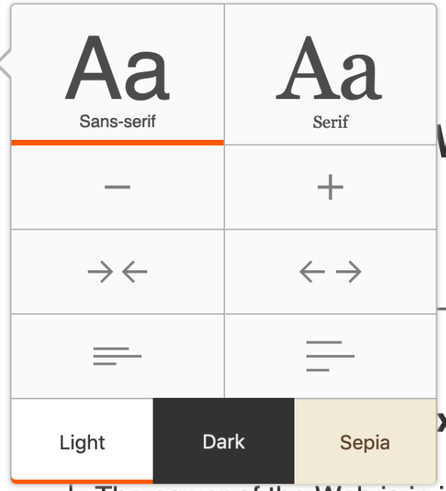

Web Accessibility

xt

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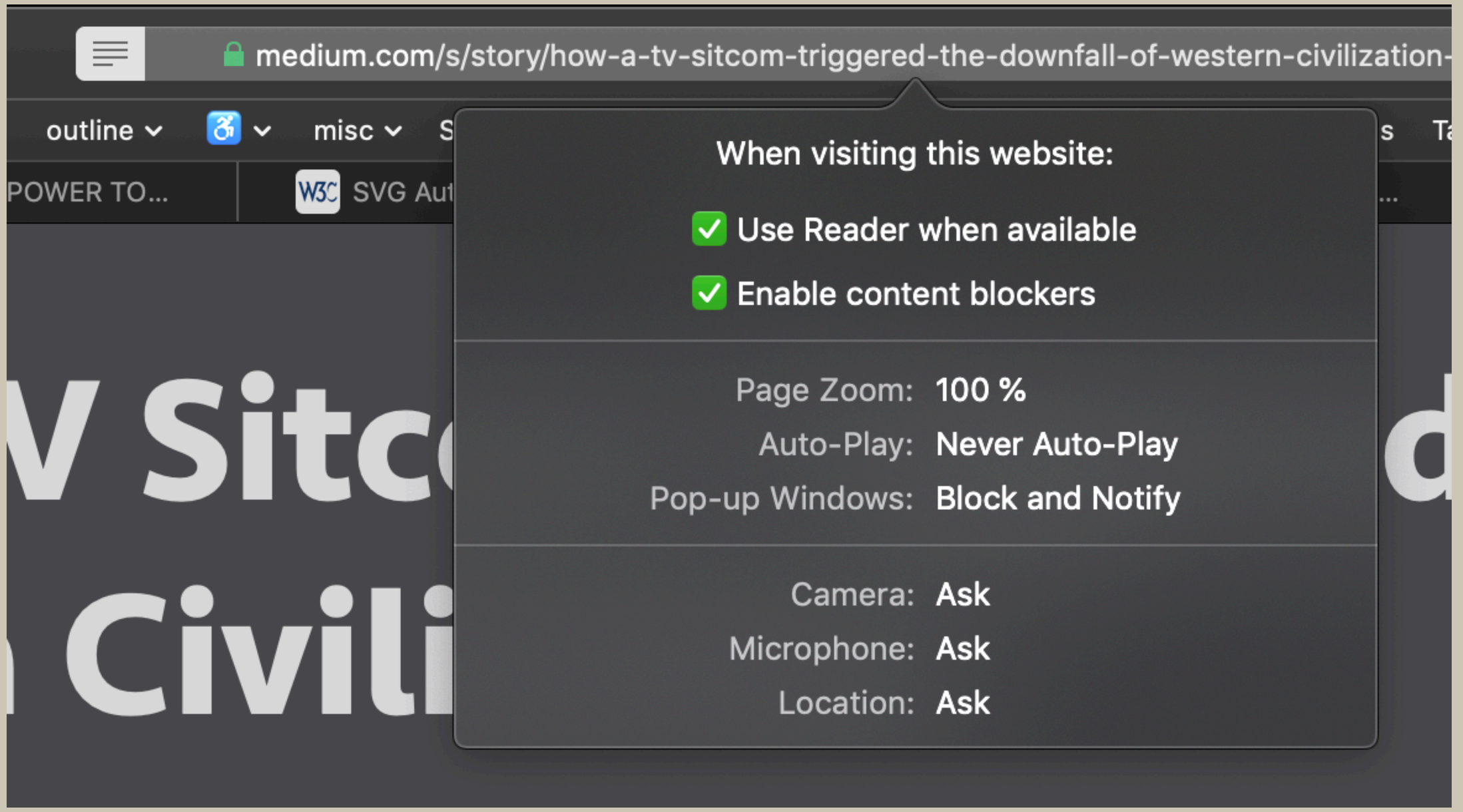
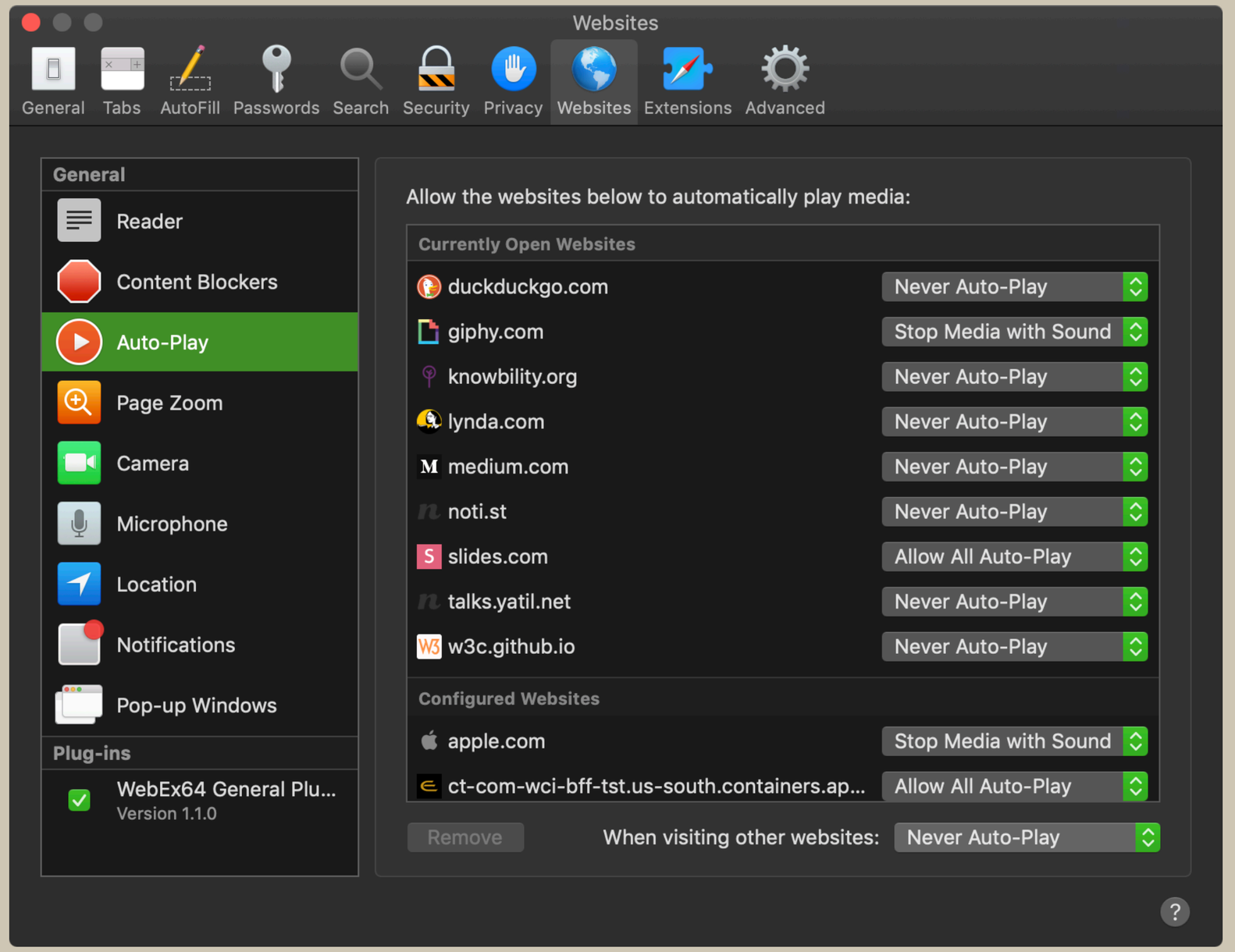
More Website Settings

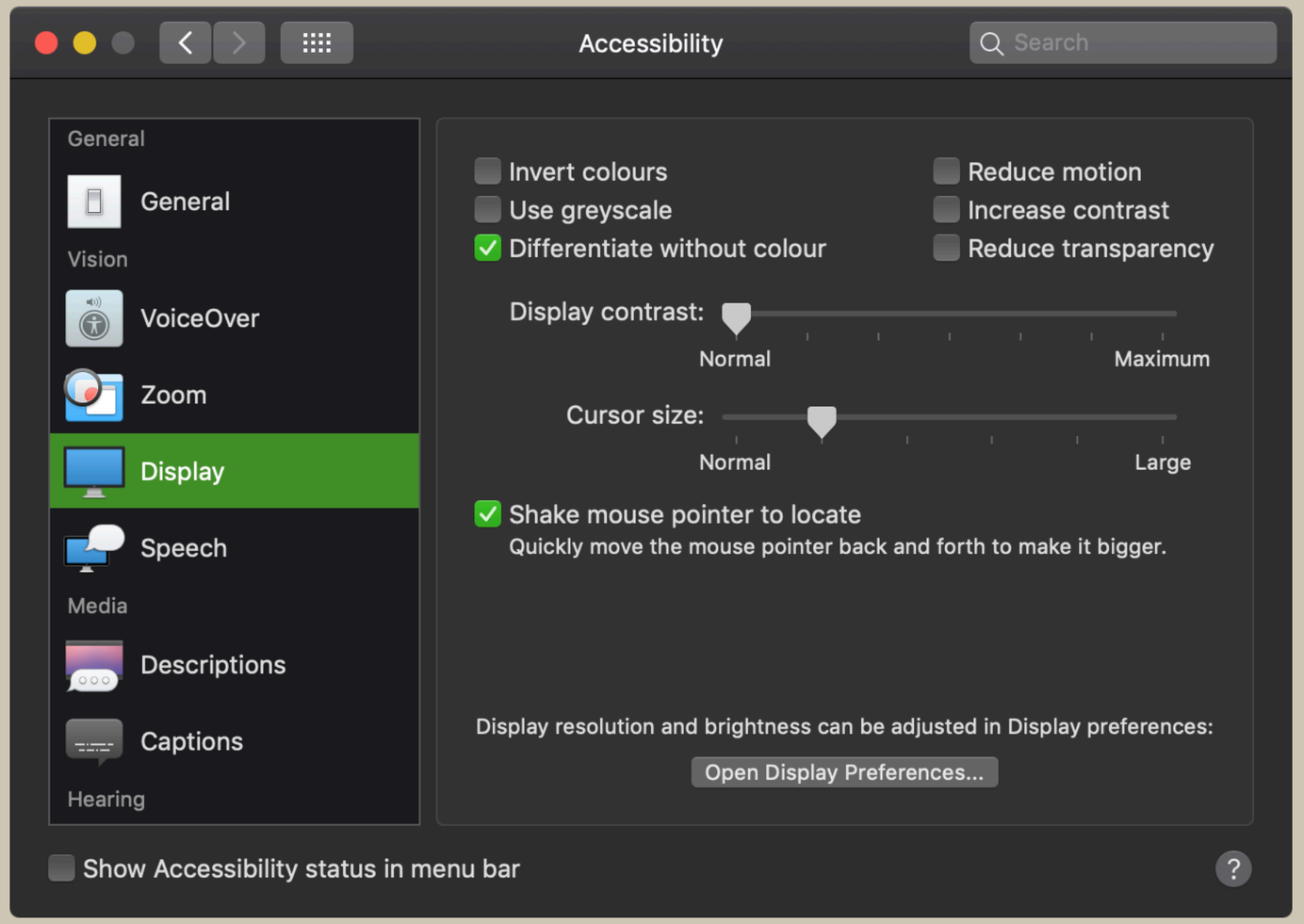

medium.com/s/story/how-a-tv-sitcom-triggered-the-downfall-of-western-civilization-
outline
misc
POWER TO...
SVG Aut
When visiting this website:
Use Reader when available
Enable content blockers
Page Zoom: 100 %
Auto-Play: Never Auto-Play
Pop-up Windows: Block and Notify
Camera: Ask
Microphone: Ask
Location: Ask


Websites
General
Tabs
AutoFill
Passwords
Search
Security
Privacy
Websites
Extensions
Advanced
General
Reader
Content Blockers
Auto-Play
Page Zoom
Camera
Microphone
Location
Notifications
Pop-up Windows
Plug-ins
WebEx64 General Plu...
Version 1.1.0
Allow the websites below to automatically play media:
Currently Open Websites
duckduckgo.com
Never Auto-Play
giphy.com
Stop Media with Sound
knowbility.org
Never Auto-Play
lynda.com
Never Auto-Play
medium.com
Never Auto-Play
noti.st
Never Auto-Play
slides.com
Allow All Auto-Play
talks.yatil.net
Never Auto-Play
w3c.github.io
Never Auto-Play
Configured Websites
apple.com
Stop Media with Sound
ct-com-wci-bff-tst.us-south.containers.ap...
Allow All Auto-Play
Remove
When visiting other websites:
Never Auto-Play
?

OS

As in Operating System

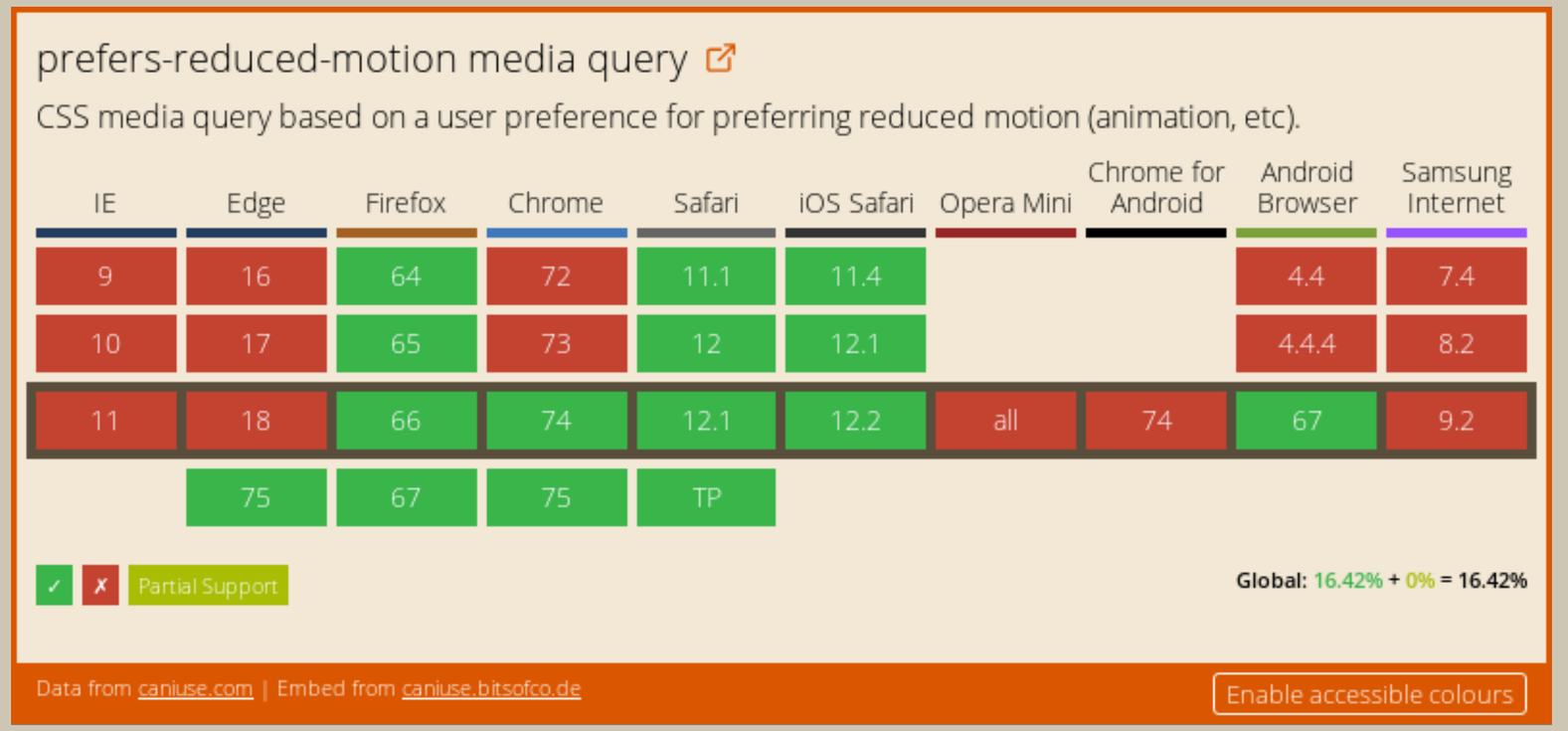
OS Settings


Accessibility
Search
General
General
Vision
VoiceOver
Zoom
Display
Speech
Media
Descriptions
Captions
Hearing
Invert colours
Use greyscale
Differentiate without colour
Reduce motion
Increase contrast
Reduce transparency
Display contrast:
Normal
Maximum
Cursor size:
Normal
Large
Shake mouse pointer to locate
Quickly move the mouse pointer back and forth to make it bigger.
Display resolution and brightness can be adjusted in Display preferences:
Open Display Preferences...
Show Accessibility status in menu bar
?

prefers-reduced-motion Media Query

```
@media (prefers-reduced-motion: reduce) {
  * {
    transition: none !important;
    animation: none !important;
  }
}
```

Support


prefers-reduced-motion media query
CSS media query based on a user preference for preferring reduced motion (animation, etc).
IE
Edge
Firefox
Chrome
Safari
iOS Safari
Opera Mini
Chrome for Android
Android Browser
Samsung Internet
9
16
64
72
11.1
11.4
4.4
7.4
10
17
65
73
12
12.1
4.4.4
8.2
11
18
66
74
12.1
12.2
all
74
67
9.2
75
67
75
TP
✓
✗
Partial Support
Global: 16.42% + 0% = 16.42%
Data from caniuse.com | Embed from caniuse.bitsofco.de
Enable accessible colours

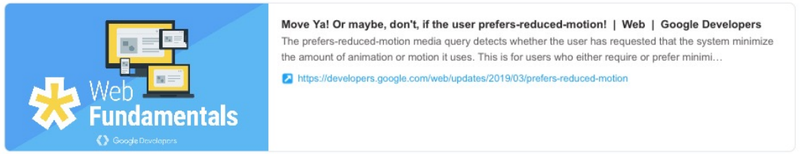
On Windows

...it's complicated

patrick h. lauke
@patrick_h_lauke

Thread Reader App
17 tweets - 11 Mar 2019
patrick_h_lauke/status/1105247881571852293

prefers-reduced-motion query now in Chrome Canary

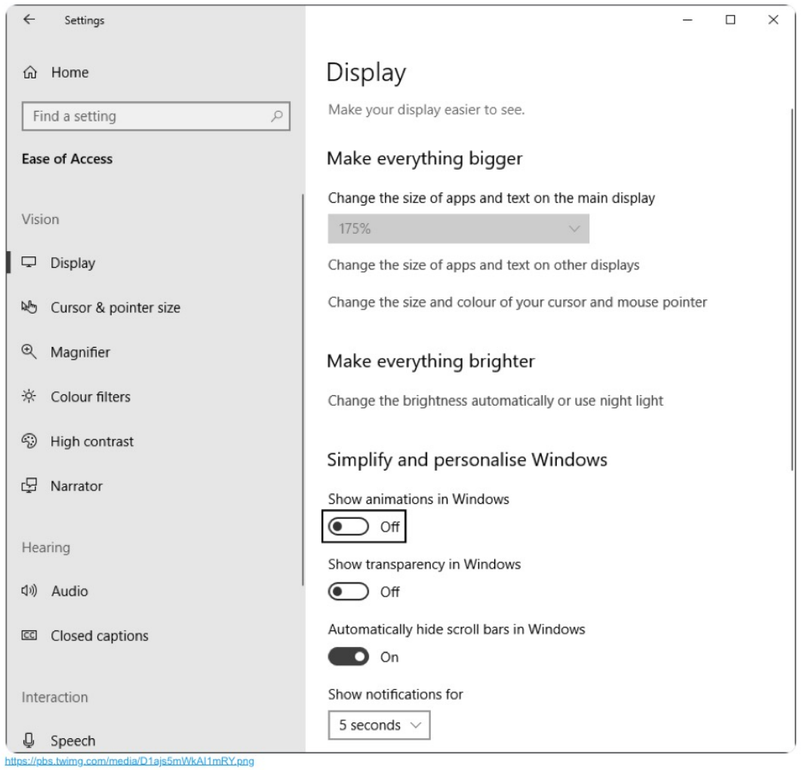


https://developers.google.com/web/updates/2019/03/prefers-reduced-motion

... and at this stage worth pointing out that on Windows, many users MAY have inadvertently set their accessibility preference, but did so to disable Windows' own animations...

i.e. not because they have a specific desire/need not to see animations in general, but just to disable the subtle animations for apps minimizing/maximizing etc. there's actually two/three settings in Windows (and some seem weirdly interconnected, or maybe i'm imagining things)

there's Settings > Ease of Access > Display > Show Animations - this, to my knowledge, is the big master switch for turning off Windows' own animations AND setting the preference that translates to prefers-reduced-motion opt-in...



https://pbs.twimg.com/media/D1ajs5mWkAI1mRY.png

Source: Patrick H. Lauke, Twitter, ThreadReader

prefers-color-scheme Media Query

```
:root {
  --color: #333;
  --bgcolor: #eee;
}

@media (prefers-color-scheme: dark) {
  :root {
    --color: #eee;
    --bgcolor: #333;
  }
}

html {
  color: var(--color);
  background-color: var(--bgcolor);
}
```

DEMO

We[3] also get a lot more tools to use!

[3] Designers & Developers

Media Queries Level 5(?)

inverted-colors[4]

- none
- inverted

[4] Planned in Media Queries Level 5

prefers-reduced-transparency[4]

- no-preference
- reduce

---

[4] Planned in Media Queries Level 5

prefers-contrast[4]

- no-preference
- high
- low

[4] Planned in Media Queries Level 5

forced-colors[4]

- none
- active

---

[4] Planned in Media Queries Level 5

Environment MQs[4]

[4] Planned in Media Queries Level 5

light-level[4]

- dim
- normal
- washed

---

[4] Planned in Media Queries Level 5

environment-blending[4]

- opaque
  - The document is rendered on an opaque medium, such as a traditional monitor or paper. Black is dark and white is 100% light.
- additive
  - The display blends the colors of the canvas with the real world using additive mixing. Black is fully transparent and white is 100% light.
    For example: a head-up display in a car.
- subtractive
  - The display blends the colors of the canvas with the real world using subtractive mixing. White is fully transparent and dark colors have the most contrast.
    For example: an LCD display embedded in a bathroom mirror.

---

[4] Planned in Media Queries Level 5

SVG

Scalable Vector Graphics

DEMO

See Doug's Session Yesterday!

Scalable Vector Graphics

- Can adapt to the viewport (or embed size).
- Can use the font color of the text.
- Can have “real” text in it.

<details> & <summary>

```
<details id="examples">

  <summary>
    <h2 id="examples">Examples</h2>
  </summary>

  <div>

    <p>Lorem ipsum dolor sit amet, consectetur adipisicing
       elit. Doloribus non amet perferendis quasi similique
       impedit maxime, iusto fuga magni. Similique sint a
       expedita esse alias voluptate illum porro placeat
       est?</p>

  </div>

</details>
```

```
<details id="examples" open>

  <summary>
    <h2 id="examples">Examples</h2>
  </summary>

  <div>

    <p>Lorem ipsum dolor sit amet, consectetur adipisicing
       elit. Doloribus non amet perferendis quasi similique
       impedit maxime, iusto fuga magni. Similique sint a
       expedita esse alias voluptate illum porro placeat
       est?</p>

  </div>

</details>
```

An Accordion in 5 Lines of JS[5]

[5] OK, jQuery in this instance.

Nice :focus Styles

- JavaScipt
- We don’t need JS.
- Thanks `currentColor`!

:focus-within

Thank You!

Eric Eggert

Web: yatil.net

E-Mail: mail@yatil.net

Social: @yatil