

***Getting Started***

**Accessibility & Multi-Screen Design**

# Eric Eggert

- Web Developer & Trainer
- **2005–2010** Freelancer
- **2011+** Co-Founder @ outline
- **2013–2016** Web Accessibility Specialist @ W3C/WAI
- **2016–2020** 50/50 Web Accessibility Expert @ Knowbility & W3C/WAI Fellow
- **2020+** Tech Team Lead @ Knowbility

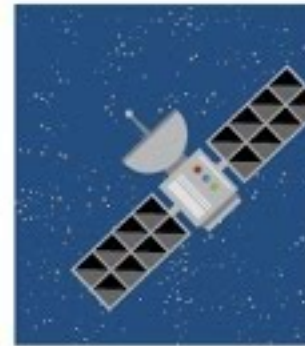
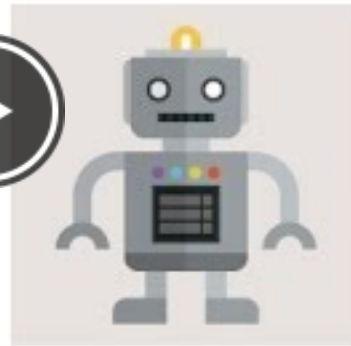
# Dates

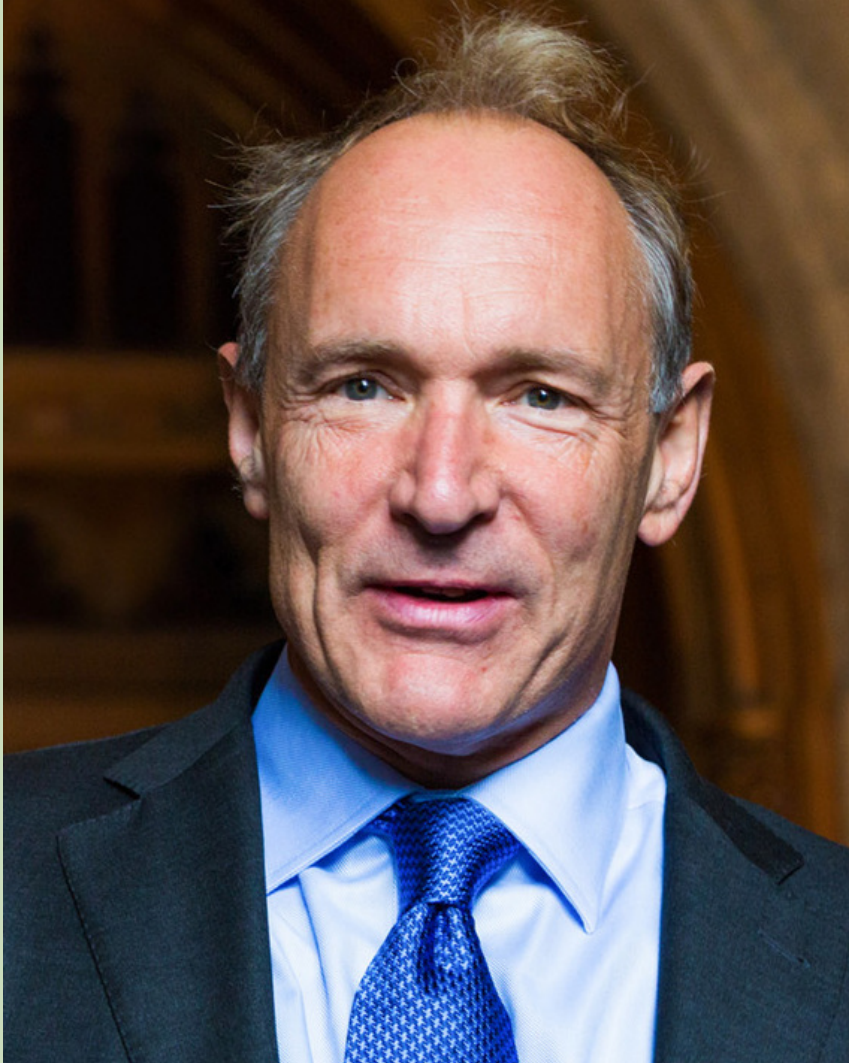
Day	Date	Time	Topic
Thu	2020-05-28	19:30	Getting Started
Thu	2019-06-04	19:30	Images
Thu	2019-06-11	19:30	Audio/Video/Animation
Thu	2019-06-18	19:30	Checking
Fri	2019-06-26	11:00	Responsive/Accessible Future & Checking Websites

See also [cos.accessibility.rocks](https://cos.accessibility.rocks)

**Who invented the Internet?**

# Cats & Wikipedia & Porn & Business & Youtube & Science





*“The power of the Web is in its universality.*

*Access by everyone regardless of disability is an essential aspect.”*

**– Tim Berners-Lee**

# Web Standards

# WWW Standards Bodies

- **W3C:** World Wide Web Consortium
- **WHATWG:** Web Hypertext Application Technology Working Group
- **Ecma International** (*née* European Computer Manufacturers Association)
- **ISO:** International Organization for Standardization



**Technologies**

# HTML5



```
<h1 class="fancy">This is a heading</h1>
```

- HTML5 developed by WHATWG as an alternative to W3C's XHTML2
- Until Recently: Development in parallel in WHATWG (*“Living Standard”*) and in the HTML Working Group of W3C (*“Snapshots”*)
  - Discussion over the direction of the specification
  - Serious differences, including the addition of a Image Description Extension in the W3C version
- Now: Working Together 🙌

# CSS



```
.fancy { font-family: fantasy; }
```

W3C's CSS Working group is working on a dozen modules.

Things we got recently:

- Grids & Subgrid
- Flexbox
- Masking
- Variable (Web)Fonts
- Animations
- Transforms
- Transitions

# ECMA Script<sup>1</sup>

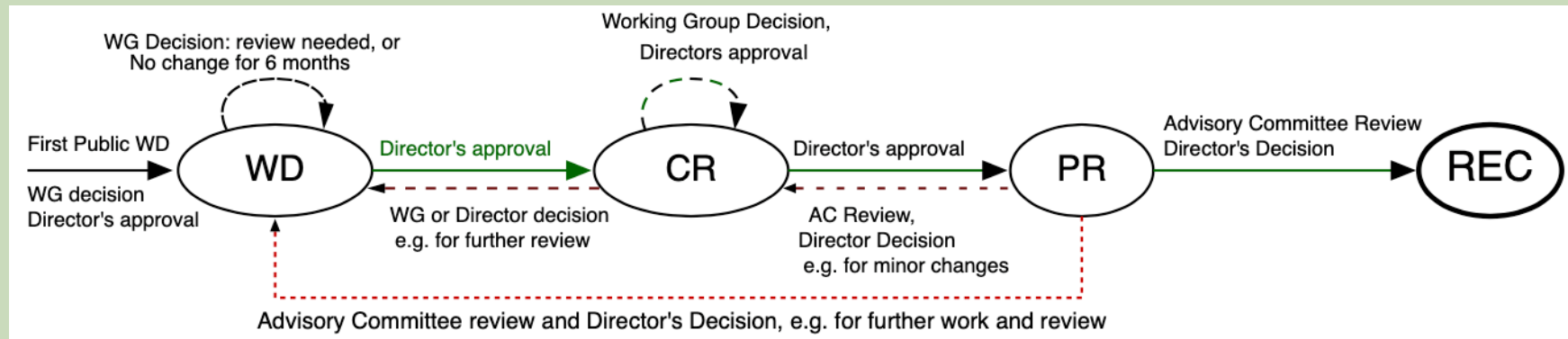


```
document.querySelector('body').style.backgroundColor = 'rebeccapurple';
```

- In the beginning just for client-side use cases
- Now a universal programming language
- Also on the server using node.js

# W3C Process<sup>1</sup>

1. Publication of the *First Public Working Draft*
2. Publication of zero or more revised *Working Drafts*
3. Publication of a *Candidate Recommendation*
4. Publication of a *Proposed Recommendation*
5. Publication as a *W3C Recommendation*
6. Possibly, Publication as an *Edited* or *Amended Recommendation*



# **Accessibility & Multi-Screen Design**





# **Accessibility ...**

- In German: „Barrierefreiheit“
- People with Disabilities
- Access content
- Adapt the web to one's needs
- Understand and interact with websites

## **... and Multi-Screen Design ...**

- Show contents optimized for all devices
- Everything needs to look good although you don't know what device will access the content
- Performance
- Progressive Enhancement

**... are very similar things.**  
Just looked at in different ways.

***Accessibility and Multi-Screen Design are *very similar things.****

# **The Business Case for Digital Accessibility**

# The Business Case for Digital Accessibility

Accessibility can:

- **Drive Innovation:** Accessibility features in products and services often solve unanticipated problems.
- **Enhance Your Brand:** Diversity and inclusion efforts so important to business success are accelerated with a clear, well-integrated accessibility commitment.
- **Extend Market Reach:** The global market of people with disabilities is over 1 billion people with a spending power of more than \$6 trillion. Accessibility often improves the online experience for all users.
- **Minimize Legal Risk:** Many countries have laws requiring digital accessibility, and the issue is of increased legal concern.

**15.3%**

**Percentage of  
People with Disabilities**

**1.1**

**billion people**



# People with Disabilities by Age Group

Age		%
16–24		6%
25–34		9%
35–44		11%
45–54		17%
55–64		23%
65–74		26%
75–84		31%
85+		38%

# [fit] Internet Use by Age Group

Age	2009	2015	2018
14–19	97.5%	100.0%	100.0%
20–29	95.2%	97.7%	99.5%
30–39	89.4%	94.2%	98.8%
40–49	80.2%	91.9%	98.5%
50–59	67.4%	83.2%	96.6%
60–69	39.1%	67.2%	82.4%
70+	15.9%	38.4%	64.7%

Internetnutzer\* in Deutschland 1997 bis 2018 in Prozent, “mindestens selten genutzt” | ARD/ZDF-Onlinestudie

***Make the web accessible for  
your future selves.***

# ***Convention on the Rights of Persons with Disabilities***

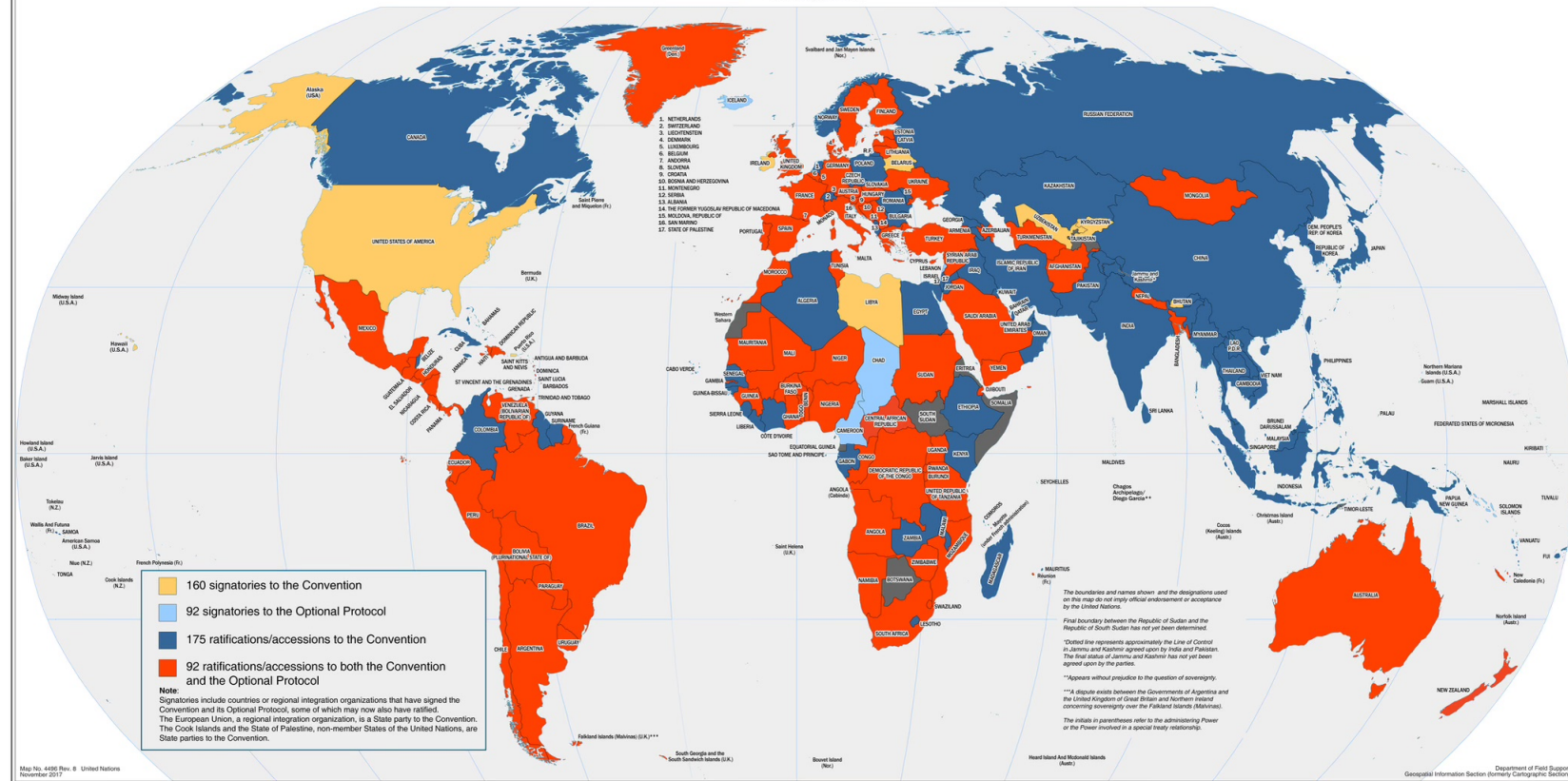
## **or: “CRPD”**



## CRPD and Optional Protocol Signatures and Ratifications

■ Not Signed ■ Signed Convention ■ Signed Convention & Protocol ■ Ratified Convention ■ Ratified Convention & Protocol

As of 19 September 2017



# CRPD & COS

- Equal opportunities and nondiscrimination, Article 5
- Access to justice, Article 13
- Inclusive education, Article 24
- Participation in political and public life, Article 29

see: [Convention on the Rights of Persons with Disabilities \(CRPD\)](#)

# W3C Accessibility Standards

Standard	Version
<u>Web Content Accessibility Guidelines (WCAG)</u>	2.1 REC
<u>Authoring Tools Accessibility Guidelines (ATAG)</u>	2.0 REC
<u>User Agent Accessibility Guidelines (UAAG)</u>	2.0 NOTE
<u>Website Accessibility Conformance Evaluation Methodology (WCAG-EM)</u>	1.0 NOTE
<u>Accessible Rich Internet Applications (WAI-ARIA)</u>	1.1 REC

# Web Content Accessibility Guidelines 2.1

includes:

- Mobile Accessibility Task Force (Mobile A11Y TF)
- Cognitive and Learning Disabilities Accessibility Task Force (Cognitive A11Y TF)
- Low Vision Accessibility Task Force (LVTF)



# WCAG 2.1 Supporting Docs

- [How to Meet WCAG 2](#)
- [Easy Checks](#)
- [Evaluation Tools List](#)
- [How People with Disabilities Use the Web](#)
- [Before and After Demo \(BAD\)](#)
- [Web Accessibility Tutorials](#)

# **EN 301 549**

“Accessibility requirements suitable for public **procurement** of ICT (Information and Communication Technology) products and services in Europe.”

# ***Principles from WCAG 2***

1. Perceivable
2. Operable
3. Understandable
4. Robust

# 1. Perceivable

Information and user interface components must be presentable to users in ways they can perceive.

## 1. Perceivable

### **1.1 Text Alternatives**

Provide text alternatives for any non-text content so that it can be changed into other forms people need, such as large print, braille, speech, symbols or simpler language.

1. Perceivable

## **1.2 Time-based Media**

Provide alternatives for time-based media. (Captions, Transcripts, Audio Descriptions)

1. Perceivable

## **1.3 Adaptable**

Create content that can be presented in different ways (for example simpler layout) without losing information or structure.

1. Perceivable

## **1.4 Distinguishable**

Make it easier for users to see and hear content including separating foreground from background.



## **2. Operable**

User interface components and navigation must be operable.

## 2. Operable

### **2.1 Keyboard Accessible**

Make all functionality available from a keyboard.

## 2. Operable

### **2.2 Enough Time**

Provide users enough time to read and use content.

## 2. Operable

### **2.3 Seizures and Physical Reactions**

Do not design content in a way that is known to cause seizures or physical reactions).

2. Operable

## **2.4 Navigable**

Provide ways to help users navigate, find content, and determine where they are.

2. Operable

## **2.5 Input Modalities**

Make it easier for users to operate functionality through various inputs beyond keyboard.

## **3. Understandable**

Information and the operation of user interface must be understandable.

### 3. Understandable

## **3.1 Readable**

Make text content readable and understandable.



3. Understandable

## **3.2 Predictable**

Make Web pages appear and operate in predictable ways.

3. Understandable

## **3.3 Input Assistance**

Help users avoid and correct mistakes.

## 4. Robust

Content must be robust enough that it can be interpreted reliably by a wide variety of user agents, including assistive technologies.

## 4. Robust

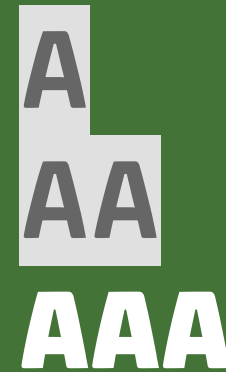
### **4.1 Compatible**

Maximize compatibility with current and future user agents, including assistive technologies.

# ***Principles & Guidelines: The Spirit of the Law***

# ***Success Criteria: The Letter of the Law***

# 3 Levels:



# SCs by Level in WCAG 2.0 and 2.1

WCAG	A	AA	AAA	Σ
2.0	25 SCs	13 SCs	23 SCs	61 SCs
2.1	30 SCs	20 SCs	28 SCs	78 SCs



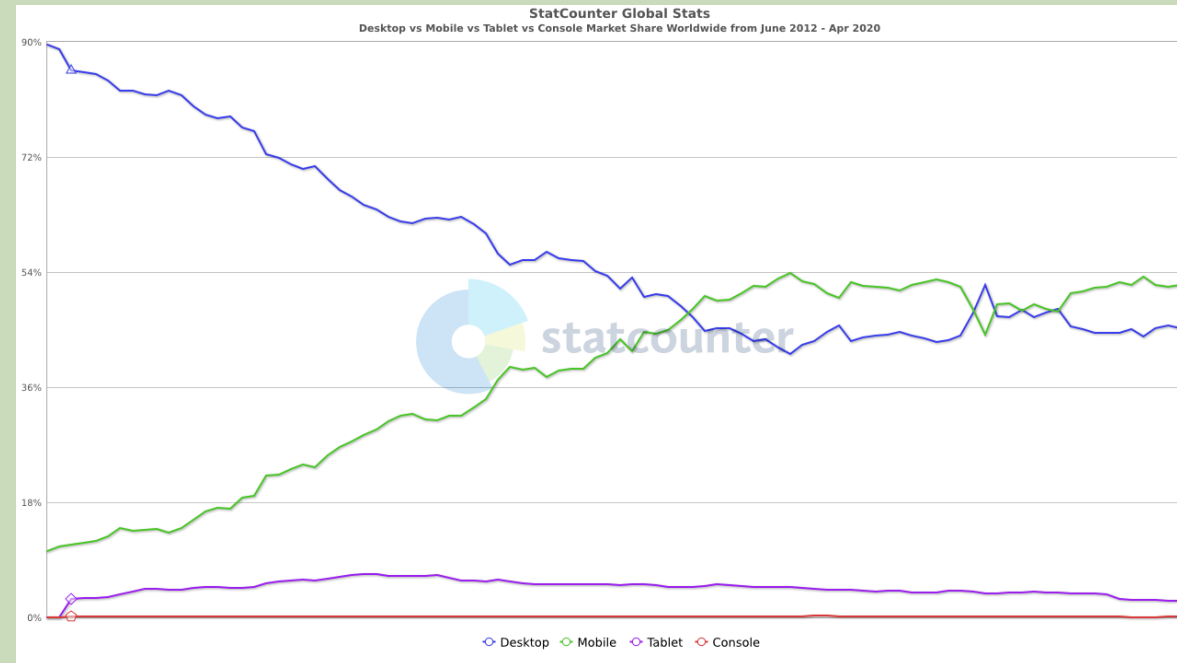
**AA+**

**Technically accessible does not  
necessarily mean usable by  
people with disabilities.**

# **Building the most inaccessible site possible with a perfect Lighthouse score**

Manuel Matuzovic, May 31, 2019

# ***Multi-Screen Design***



## Desktop vs Mobile vs Tablet vs Console Market Share Worldwide | StatCounter Global Stats

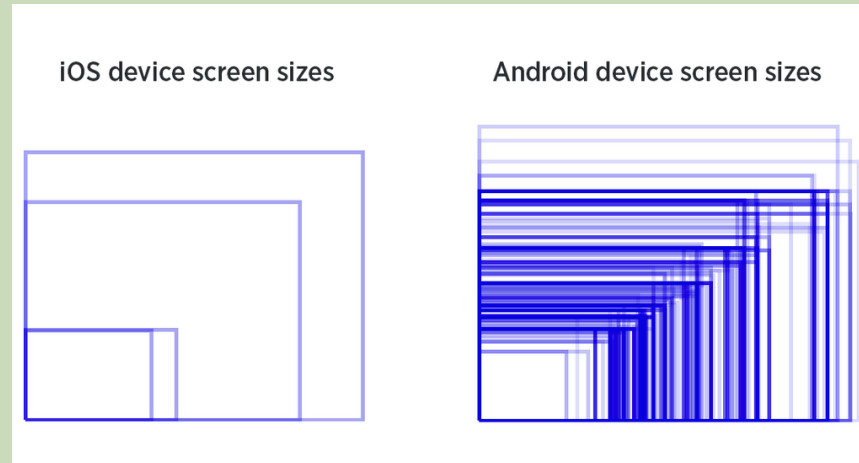
# Responsive Web Design

*Rather than tailoring disconnected designs to each of an ever-increasing number of web devices, we can treat them as facets of the same experience. We can design for an optimal viewing experience, but embed standards-based technologies into our designs to make them not only more flexible, but more adaptive to the media that renders them. In short, we need to practice responsive web design.*

– Ethan Marcotte, [Responsive Web Design](#), A List Apart, May 25, 2010



Source: [Devices | Brad Frost | Flickr](#)



Graphic courtesy of [OpenSignal.com](https://www.opensignal.com)



# Embrace the web medium

*The control which designers know in the print medium, and often desire in the web medium, is simply [...] the limitation of the printed page. We should embrace the fact that the web doesn't have the same constraints, and design for this flexibility.*

– John Allsopp, [A List Apart: A Dao of Web Design](#), April 07, 2000

# Mobile web stats

- 655 million people used Facebook **exclusively** on their mobile phones – almost 50%<sup>1</sup> (June 2012: 102m/July 2014: 399m<sup>2</sup>)
- 34.7% of „Black Friday" traffic 2014, 14.6% on tablets (Mobile: 2012: 24%, 2011: 14,3%, 2010: 5,5%)

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1. [Nearly half of Facebook's users only access the service on mobile | VentureBeat](#)

2. [Facebook's new stats: 1.32 billion users, 30 percent only use it on their phone - The Verge](#)

# Facets of the same experience

*Rather than tailoring disconnected designs to each of an ever-increasing number of web devices, we can treat them as facets of the same experience. We can design for an optimal viewing experience, but embed standards-based technologies into our designs to make them not only more flexible, but more adaptive to the media that renders them.*

– Ethan Marcotte [A List Apart: Responsive Web Design](#), May 25, 2010

# Basic Concepts of RWD

- Flexible Grid
- Flexible Media
- CSS3 MediaQueries

# Media Queries



```
@media screen and (max-device-width: 480px) {  
  .column {  
    float: none;  
  }  
}
```



```
.figure {  
  float: left;  
  margin: 0 3.317535545023696% 1.5em 0; /* 21px / 633px */  
  width: 31.121642969984202211%;      /* 197px / 633px */  
}  
li#f-mycroft, li#f-winter {  
  margin-right: 0;  
}  
  
@media screen and (max-width: 400px) {  
  .figure,  
  li#f-mycroft {  
    margin-right: 3.317535545023696682%; /* 21px / 633px */  
    width: 48.341232227488151658%;      /* 306px / 633px */  
  }  
  li#f-watson, li#f-moriarty {  
    margin-right: 0;  
  }  
}  
  
@media screen and (min-width: 1300px) {  
  .figure,  
  li#f-mycroft {  
    margin-right: 3.317535545023696682%; /* 21px / 633px */  
    width: 13.902053712480252764%;      /* 88px / 633px */  
  }  
}
```

**DEMO**

# Examples

- [Stripe](#)
- [Tatiana Mac](#)
- [The Guardian](#)
- [A List Apart](#)
- [Slate Magazine](#)

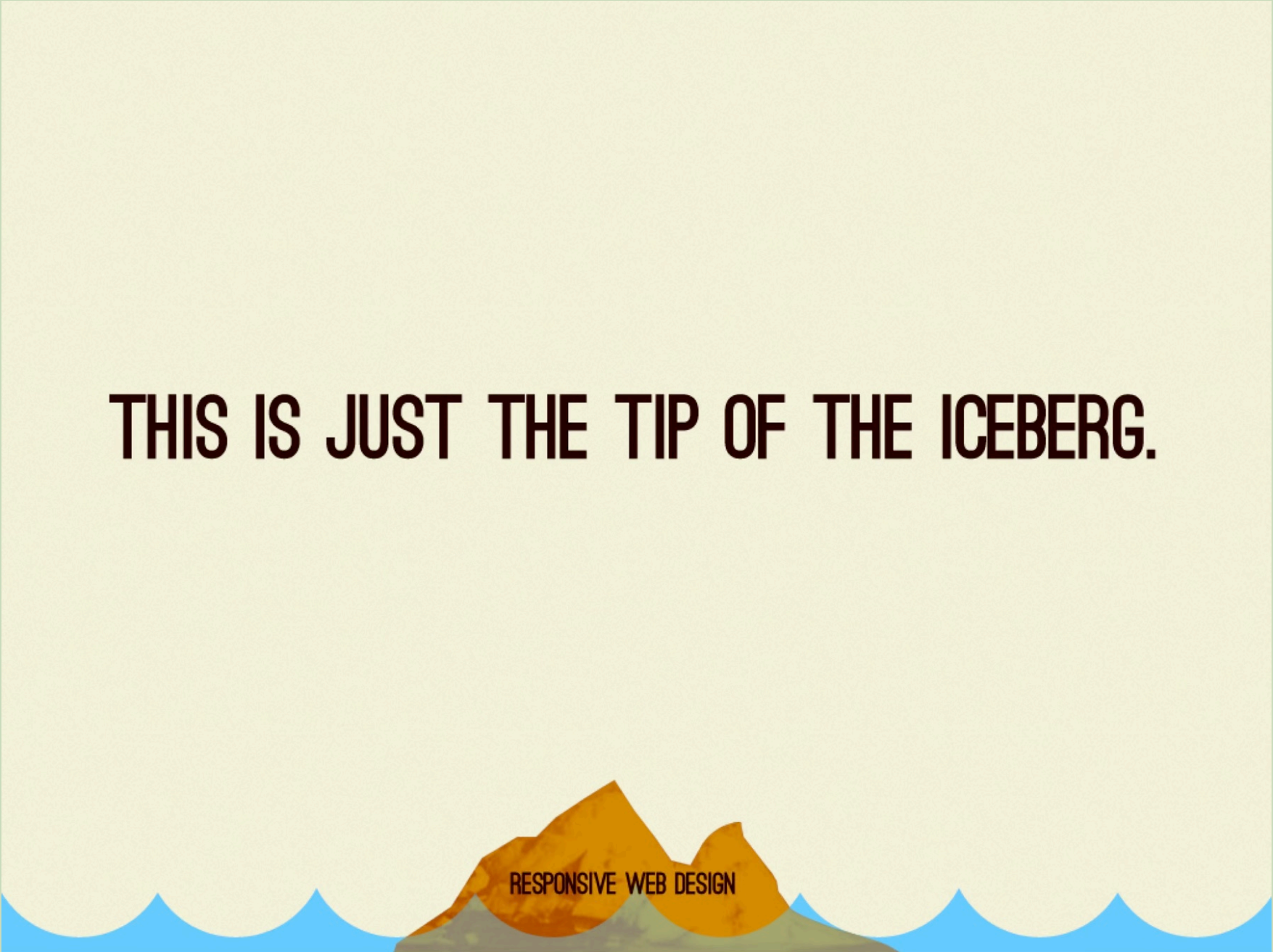


*Anything that's fixed and unresponsive isn't web design anymore, it's something else. If you don't embrace the inherent fluidity of the web, you're not a web designer, you're something else. Web design is responsive design.*

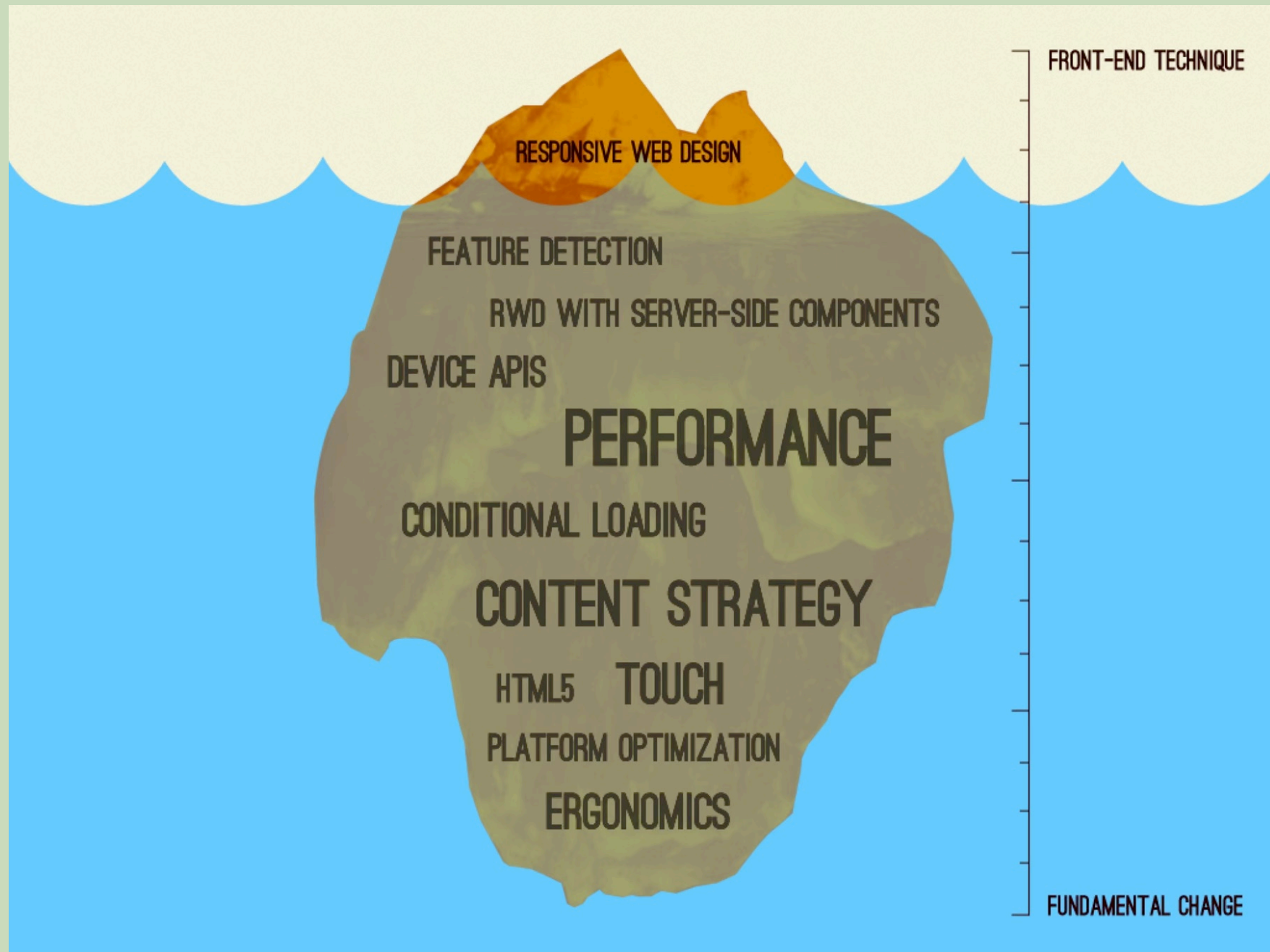
***Responsive Web Design is  
web design, done right.***

– Andrew Clarke, [The Pastry Box Project](#), January 3, 2012

**THIS IS JUST THE TIP OF THE ICEBERG.**



**RESPONSIVE WEB DESIGN**



# ***Additional Principles***

- Ubiquity
- Flexibility
- Performance
- Progressive Enhancement
- Sustainability

# Ubiquity





# **The One Web**

- Thematic consistency
- Same URL, same content

**Give the user what they want,  
when they want it.**



**71%**

**of mobile users expect that websites  
load at least as fast as on the desktop**

New Study Reveals the Mobile Web Disappoints Global Consumers

# 5s

**is the maximum time 74% of mobile users are willing wait for a website to load.**

*After that they walk away.*

**2MB**

**Average weight of web page**



**86%**

**of responsive websites weight *as much*  
in their mobile view as they do in the  
desktop view**

# **The Website Obesity Crisis**

**Maciej Cegłowski, 2015**

# **Performance is Invisible**

# **Performance is Design**

**RWD ≠ one size fits all**



# **Progressive Enhancement**

# @supports CSS Feature Queries





## CSS Feature Queries

CSS Feature Queries allow authors to condition rules based on whether particular property declarations are supported in CSS using the @supports at rule.

IE	Edge	Firefox	Chrome	Safari	iOS Safari	Opera Mini	Chrome for Android	Android Browser	Samsung Internet
9	79	74	79	12.1	13.2			4.4	9.2
10	80	75	80	13	13.3			4.4.4	10.1
11	81	76	81	13.1	13.4	all	81	81	11.1
		77	83	TP					

✓ ✗ Partial Support

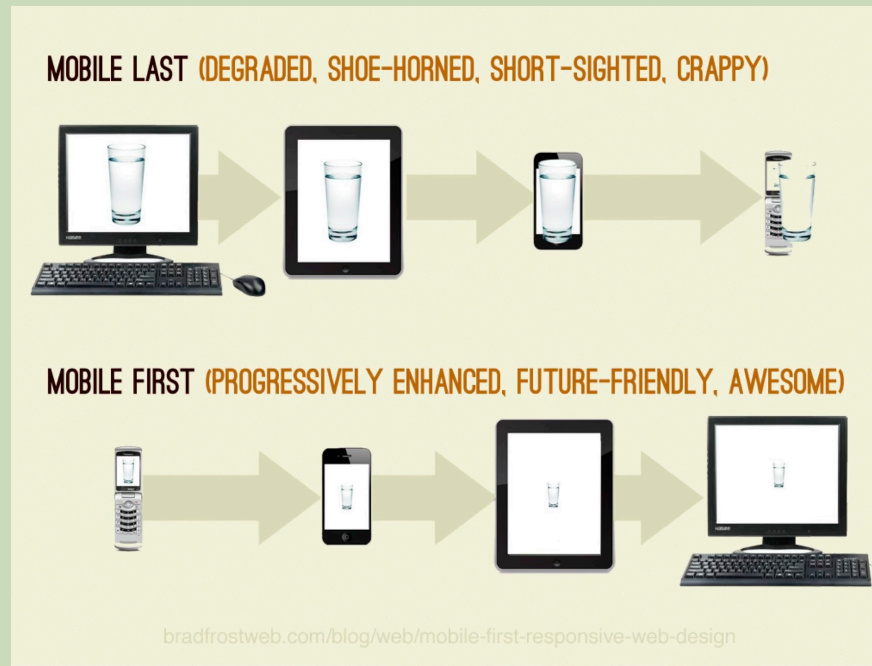
Global: 96.64% + 0% = 96.64%

Data from caniuse.com | Embed from caniuse.bitsofco.de

28 May 2020



```
.main { width: 45% ; }  
.div1 { float: left ; }  
.div2 { float: right; }  
  
@supports (display: grid;) {  
  .main {  
    display: grid;  
    grid-columns-template: 1fr 1fr;  
  }  
}
```



## Brad Frost: Mobile-First Responsive Web Design

# **Embrace the unforeseeable**





# Summary

1. We don't know what the next trend is.
2. We don't have any control.
3. Base Principles: Flexible Grid and Media, CSS3 MediaQueries
4. Basic Principles: Ubiquity, Flexibility, Performance, Progressive Enhancement, Sustainability

# ***Web Accessibility Getting Started***

# **Web Accessibility Perspectives**

Explore the Impact and Benefits for Everyone, 10 Short Video Introductions

# **How People with Disabilities use the Web**

- Stories of Web Users
- Diverse Ability and Barriers
- Tools and Techniques

# Tips for Getting Started

- Designing
- Writing
- Developing

# The End