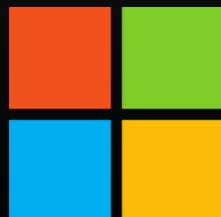


BEYOND RESPONSIVE



Aaron Gustafson
[@AaronGustafson](https://twitter.com/AaronGustafson)
slideshare.net/AaronGustafson

THIS IS NOT
THE WEB.



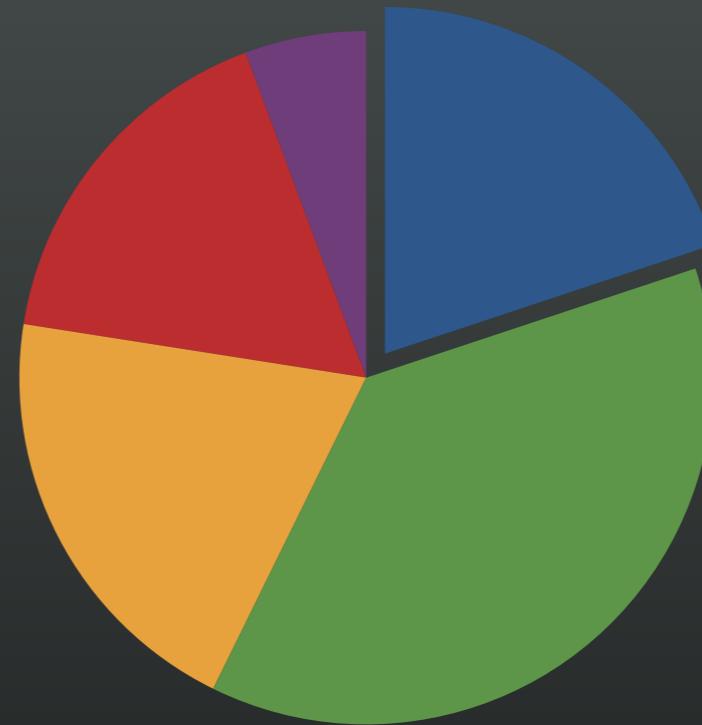
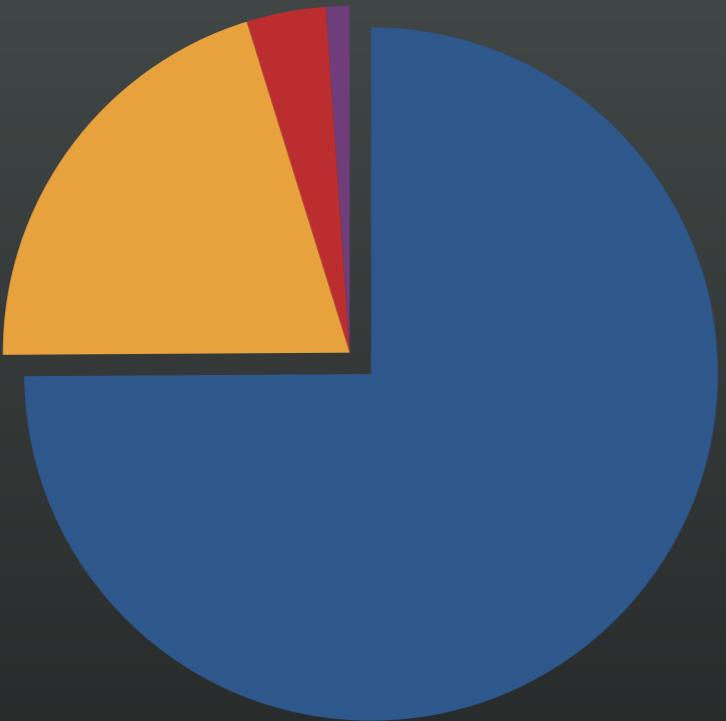
“ [In 2008] the majority of our visitors saw our website in Internet Explorer on a Windows computer on a minimum 1,024 pixel wide screen. Times have really changed.

**Jason Samuels
IT Manager,
National Council on Family Relations**
Source



“ Windows users used to comprise 93.5% of our web visits. Now that percentage is 68.2%.

“ The percentage visiting from a mobile device or tablet ... was just 0.2% in 2008. It has since grown exponentially to **14.4%** today.



“ [In 2008] 74.9% of our web visitors used Internet Explorer. That number has fallen to 19.7%. Firefox now comprises 20%, Safari 16.7%, and Chrome 37%.

**“ In the second quarter of 2008
we detected 71 different
screen resolutions among our
visitors. In the first quarter of
2014 we detected**

**“ In the second quarter of 2008
we detected 71 different
screen resolutions among our
visitors. In the first quarter of
2014 we detected 1062**

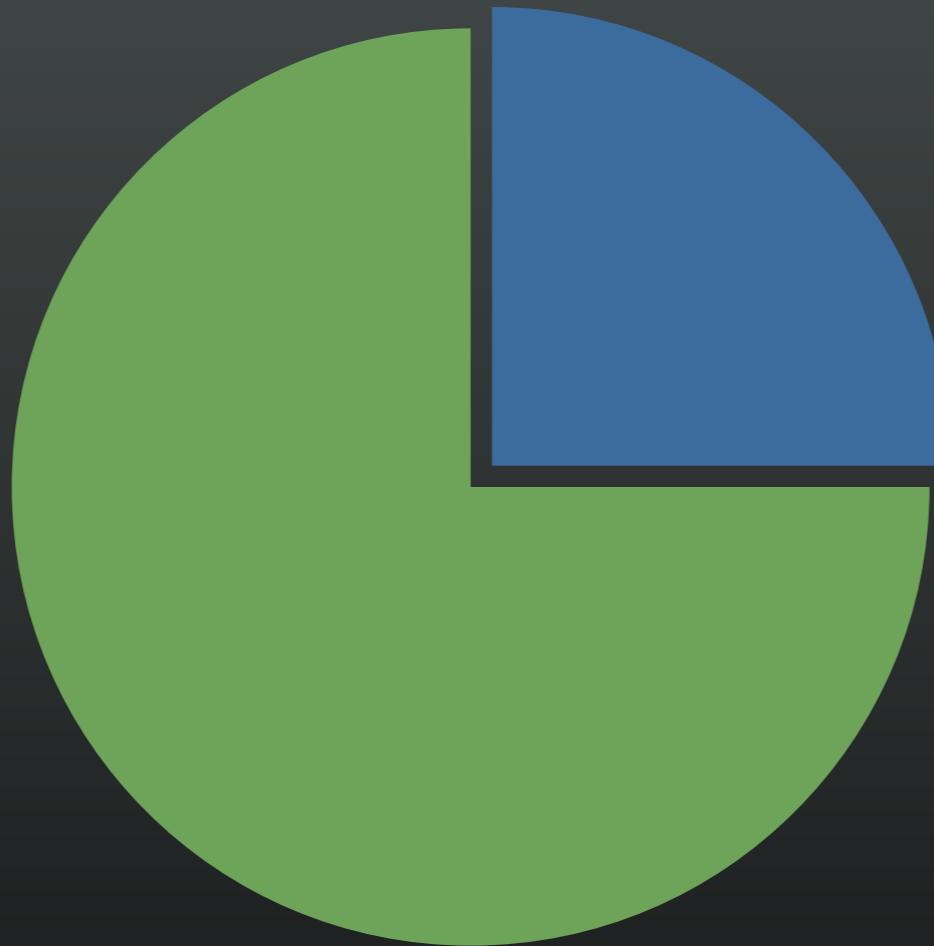
**“ In 2008, 27 screen
resolutions showed up with
more than 10 visits, in 2014
that number was 200**





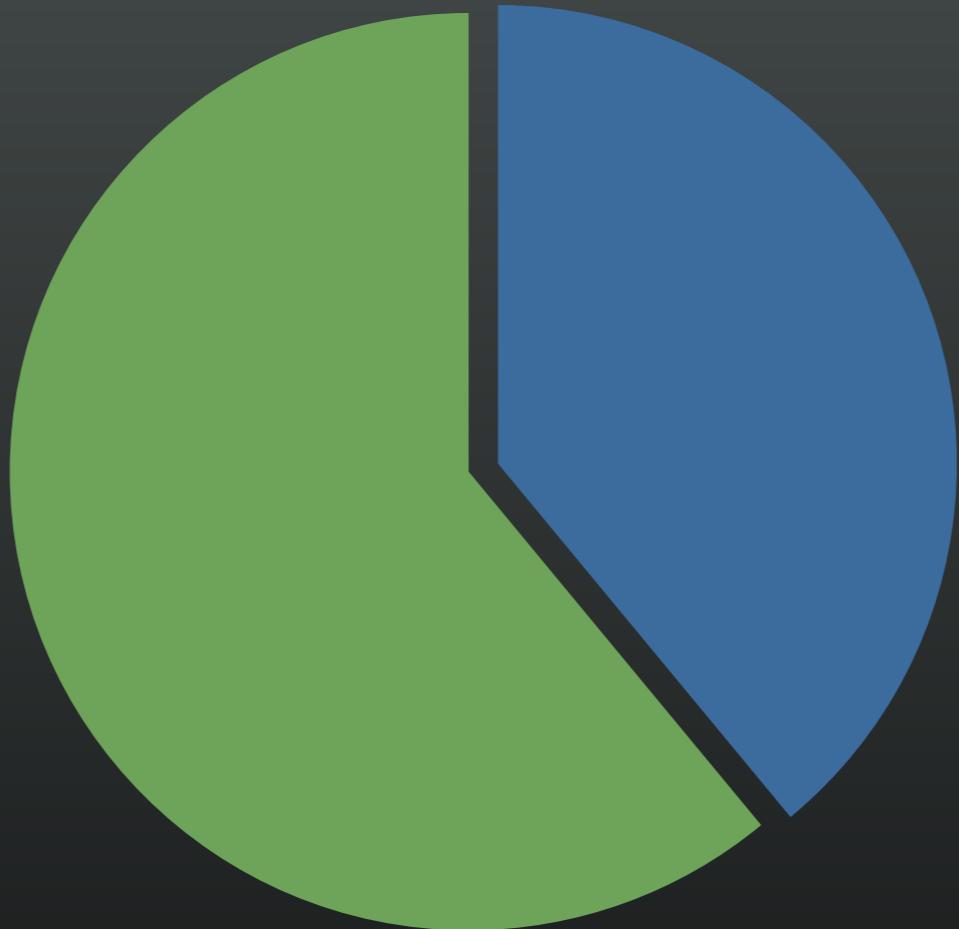






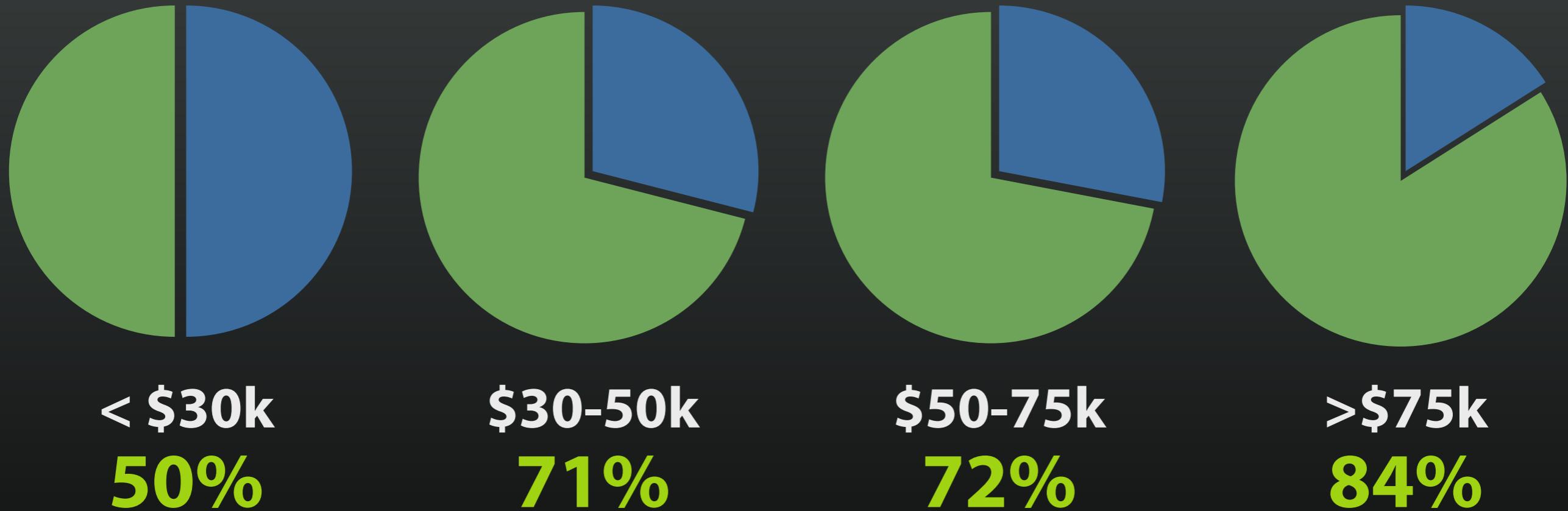
“ Smartphones have reached
75% penetration in the US...

[Source](#)



**...but that's concentrated in
61% of households**

U.S. Smartphone penetration #'s released in March 2015



[Source](#)

U.S. Smartphone penetration #'s released in March 2015



< \$30k

50%



\$30-50k

71%

\$50-75k

72%

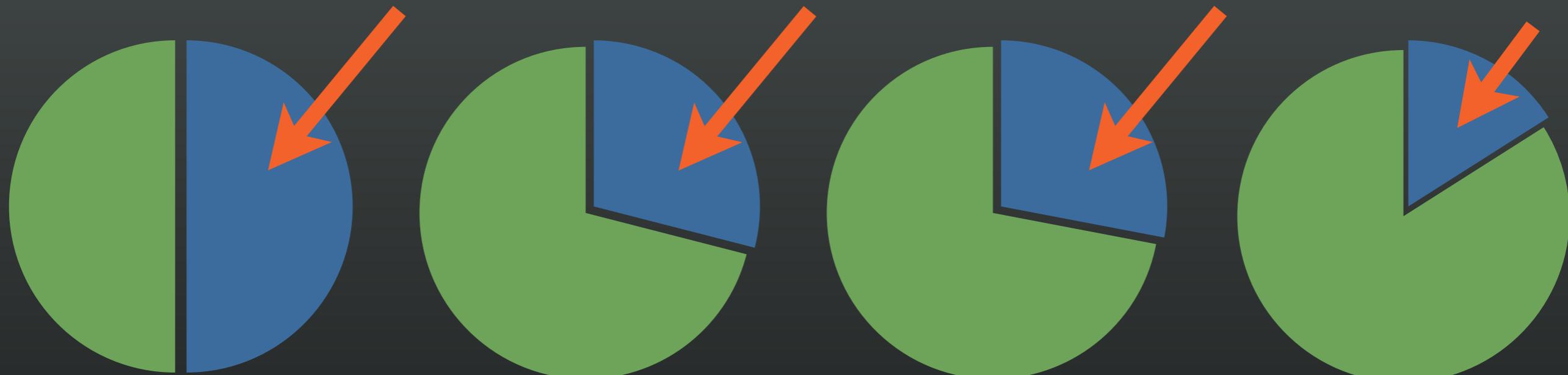
>\$75k

84%

\$30k = Average US income 2013

Source

U.S. Smartphone vs. Income distribution



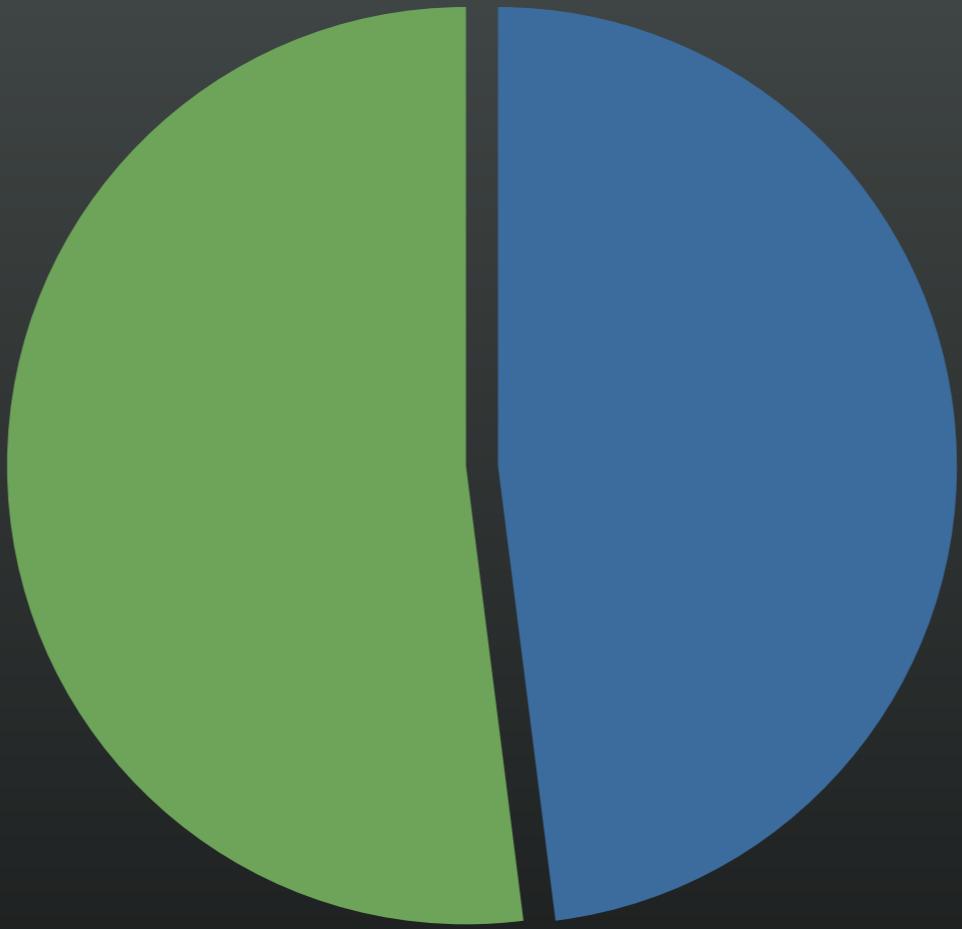
< \$30k
50%

\$30-50k
71%

\$50-75k
72%

>\$75k
84%





**Smartphone users making < \$30k/yr
experienced app errors
52% of the time**

[Source](#)



Galaxy S5

5.1" (1920 × 1080)

2GB RAM

16GB Storage

16MP Camera

2.5GHz Quad-core

Android 4.4

\$799



Galaxy S5

5.1" (1920 × 1080)
2GB RAM
16GB Storage
16MP Camera
2.5GHz Quad-core
Android 4.4
\$799

Cloud FX

3.5" (480 × 320)
128MB RAM
256MB Storage
2MP Camera
1GHz Single-core
Firefox OS 1.3
\$35





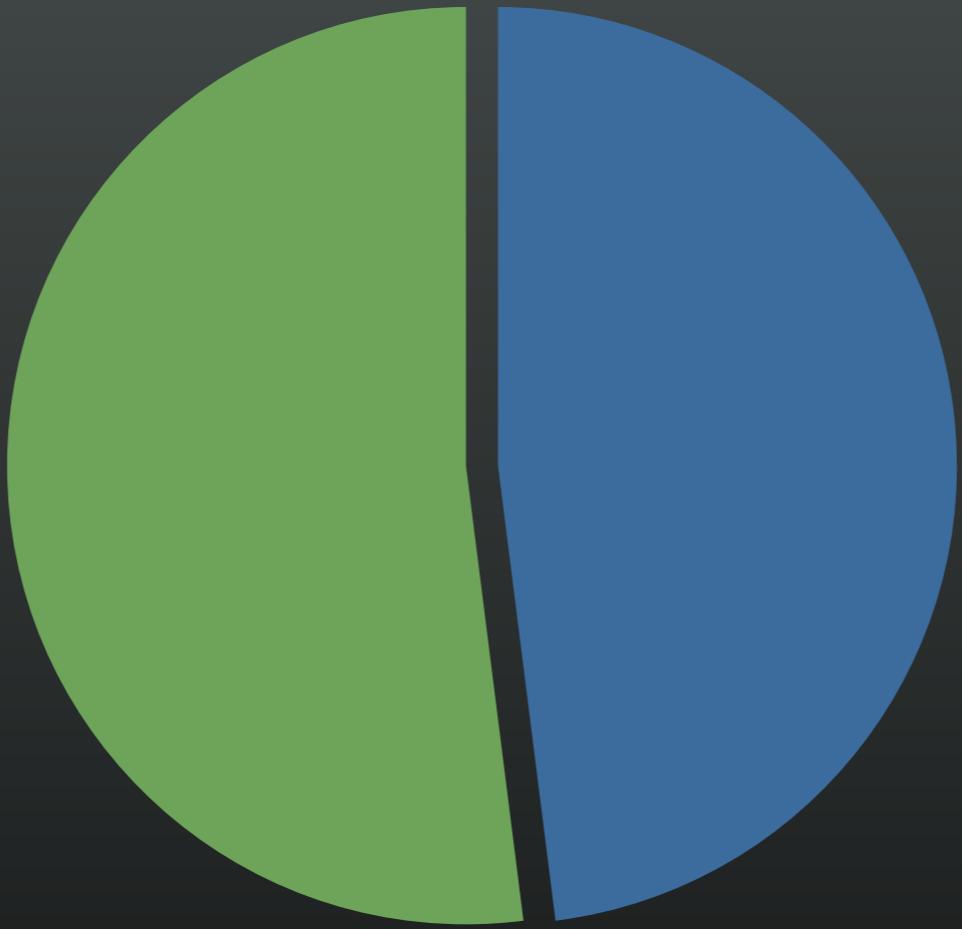
Galaxy S5

5.1" (1920 × 1080)
2GB RAM
16GB Storage
16MP Camera
2.5GHz Quad-core
Android 4.4
\$799

Dash JR K

3.5" (480 × 320)
256 MB RAM
512MB Memory
2MP camera
1.3 GHz Dual-core
Android 4.4
\$43





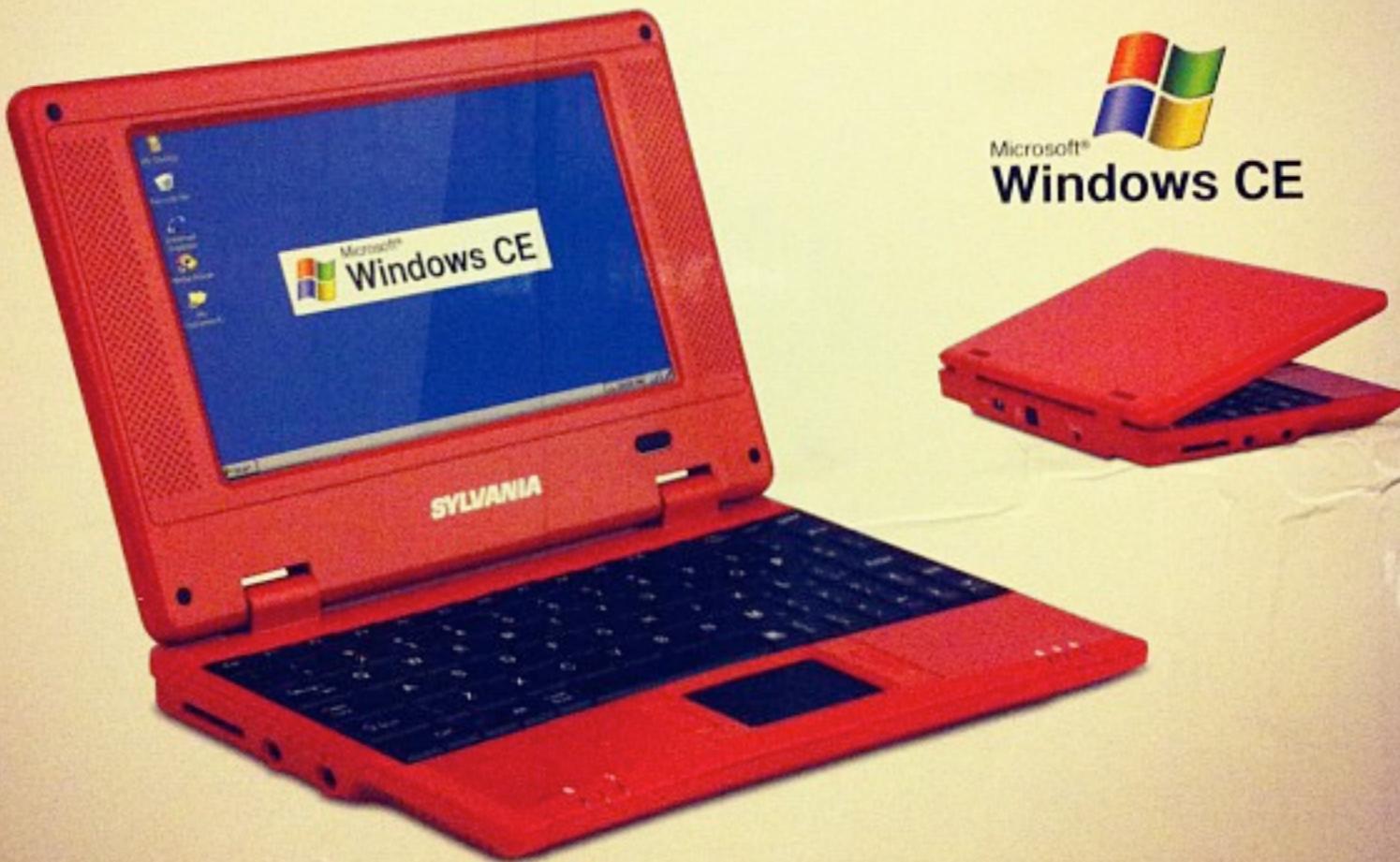
As of Q4 2014, **62%** of new
non-phone AT&T subscriptions are
connected cars

[Source](#)



SYLVANIA

WIRELESS MOBILE INTERNET DEVICE



Microsoft®
Windows CE



E-mail



Web Browsing

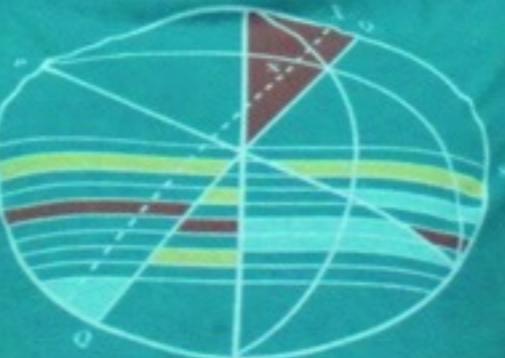
facebook

Social Networking

YouTube™

YouTube
Video Streaming





Fix. 1301







We DON'T know



We DON'T know

Even when
we think
we know,
WE ARE
PROBABLY
WRONG

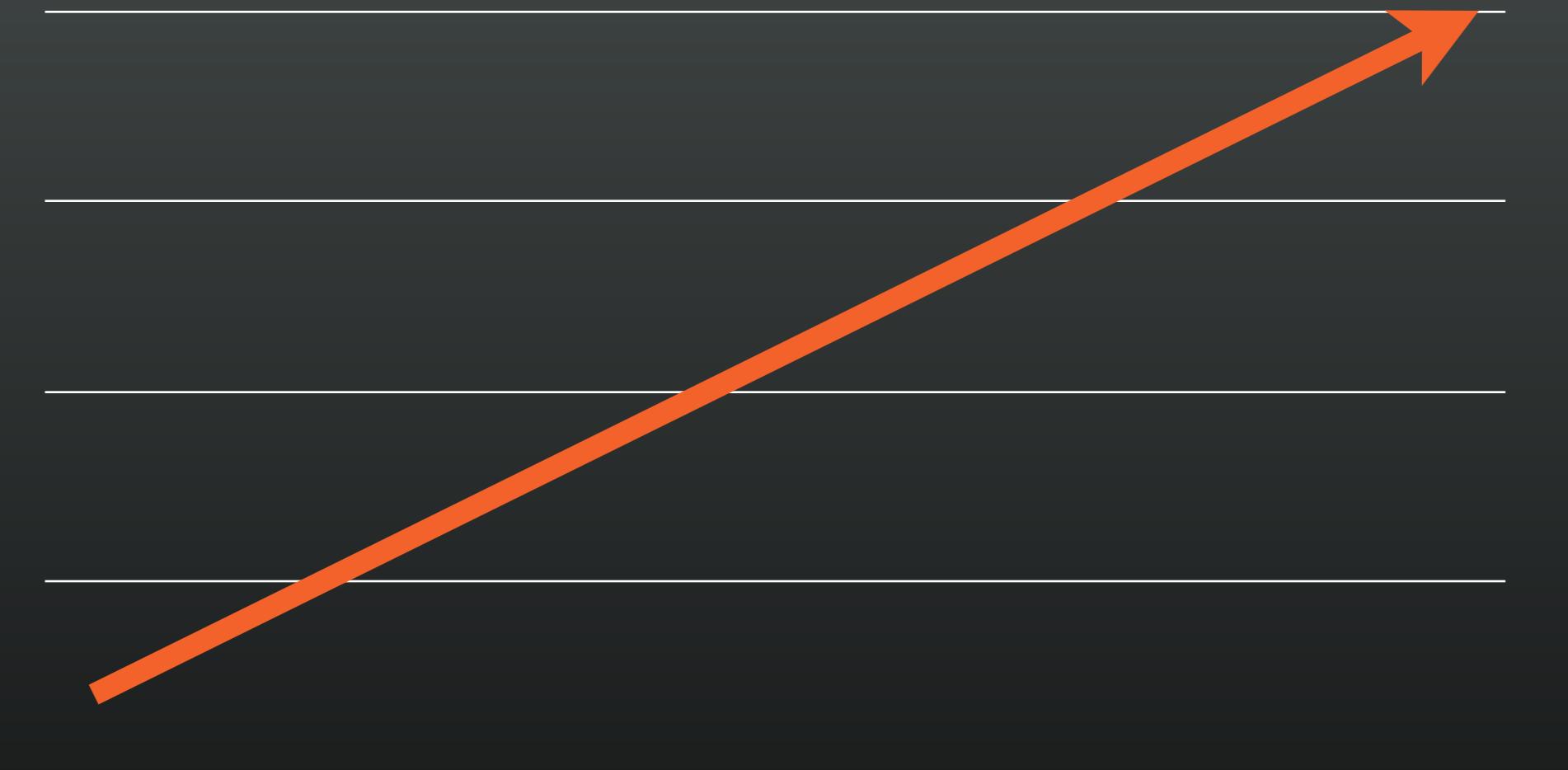
So how
do we COPE?

Progressive Enhancement



**Technological
restrictions**

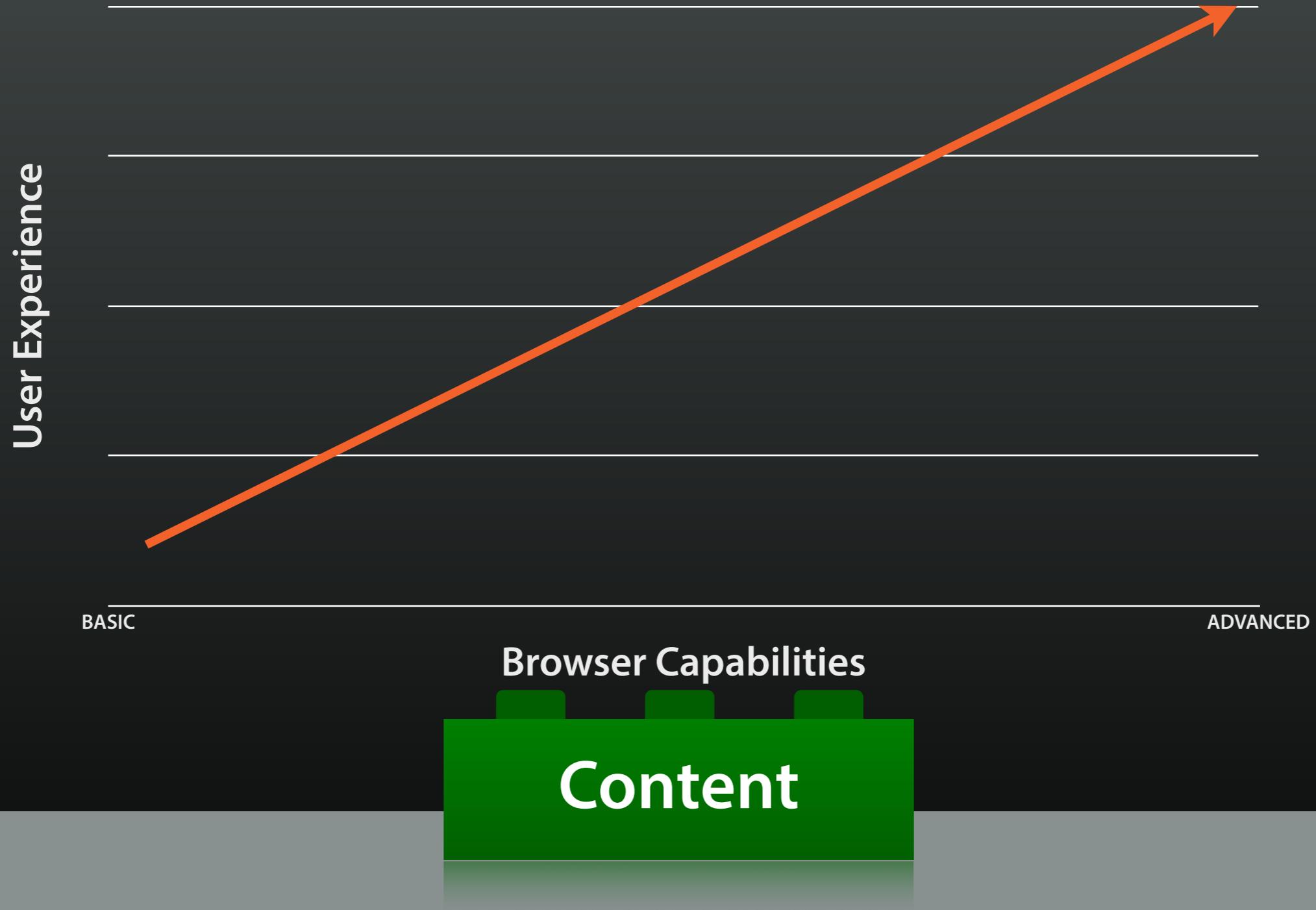
User Experience

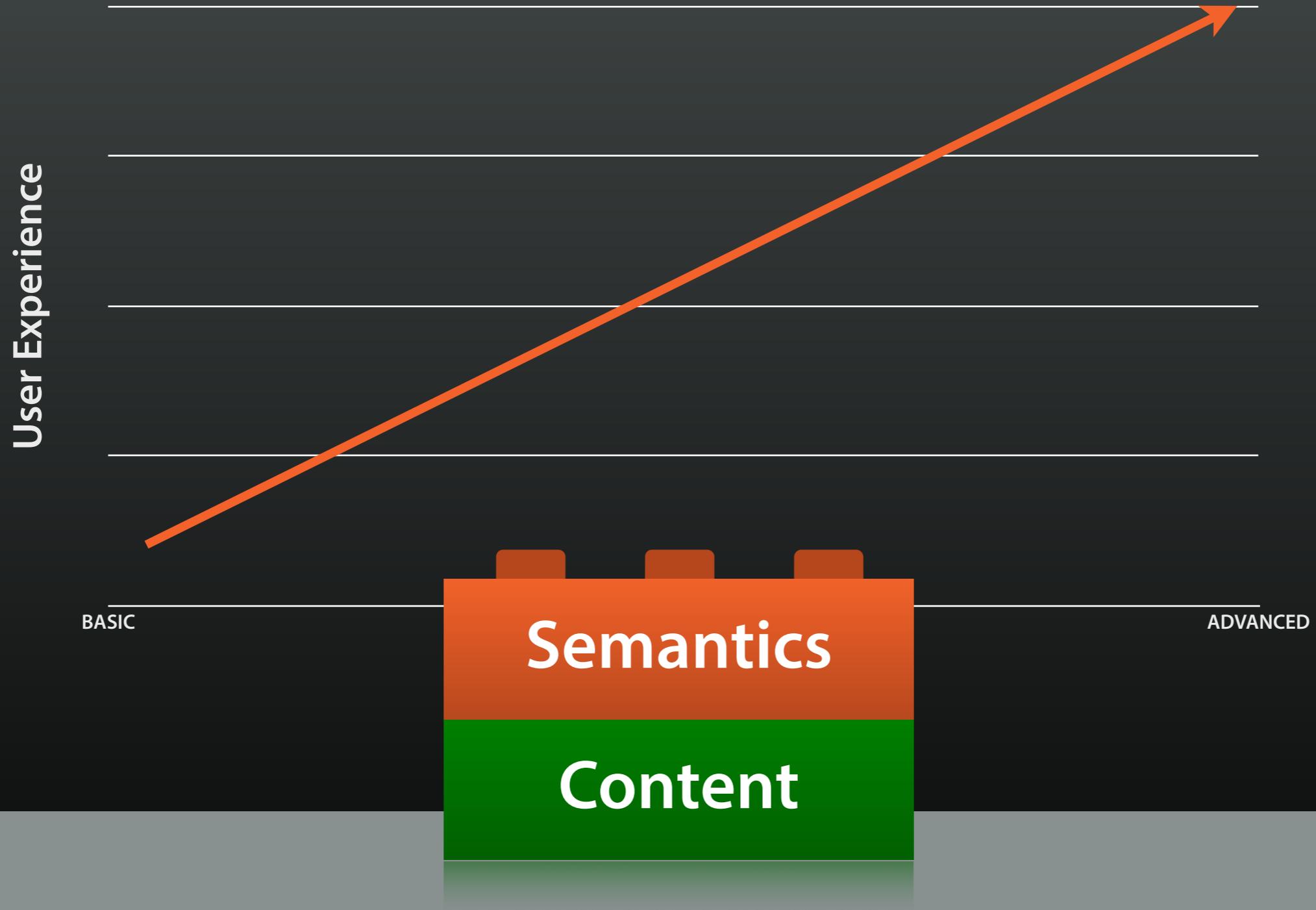


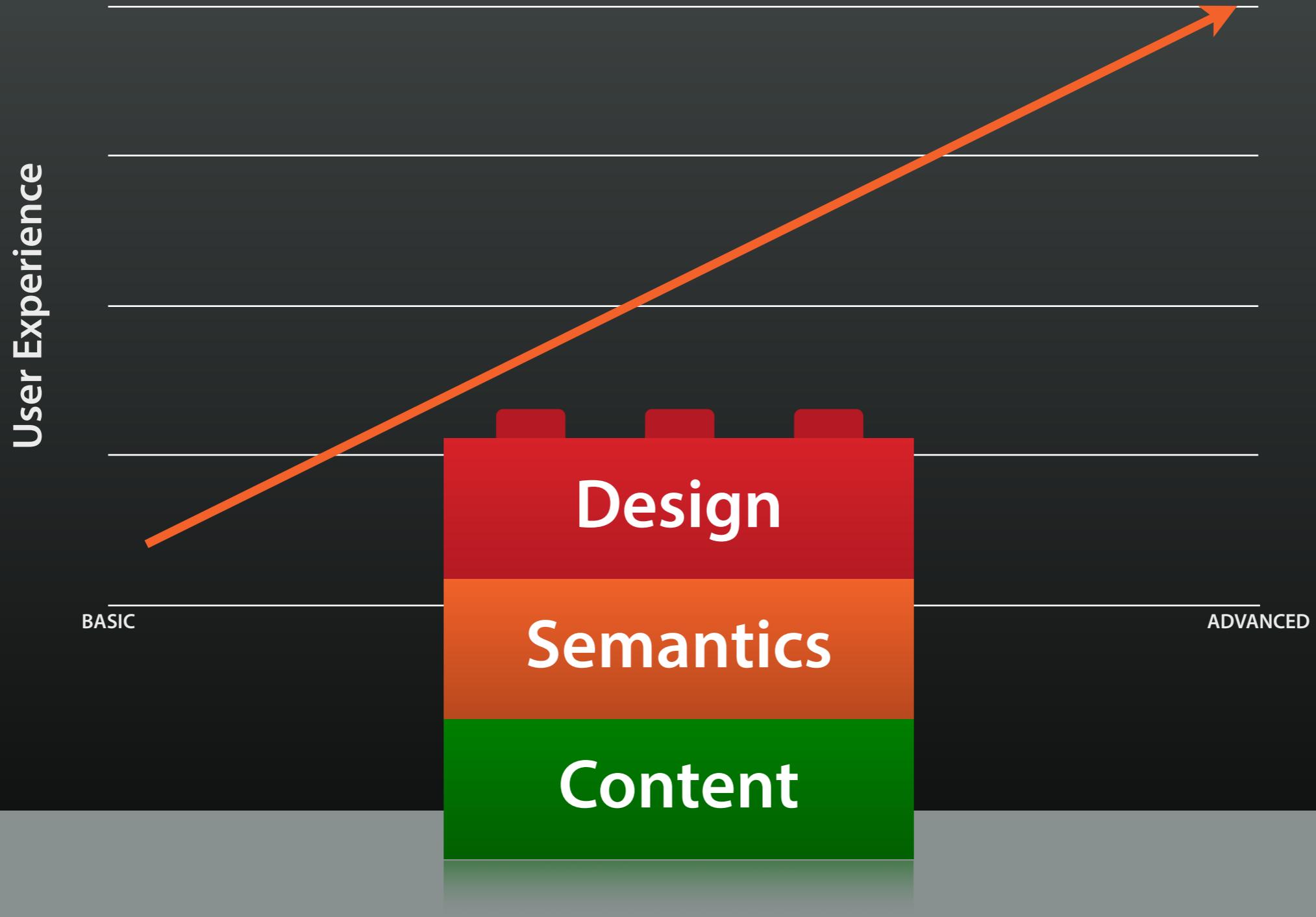
Browser Capabilities

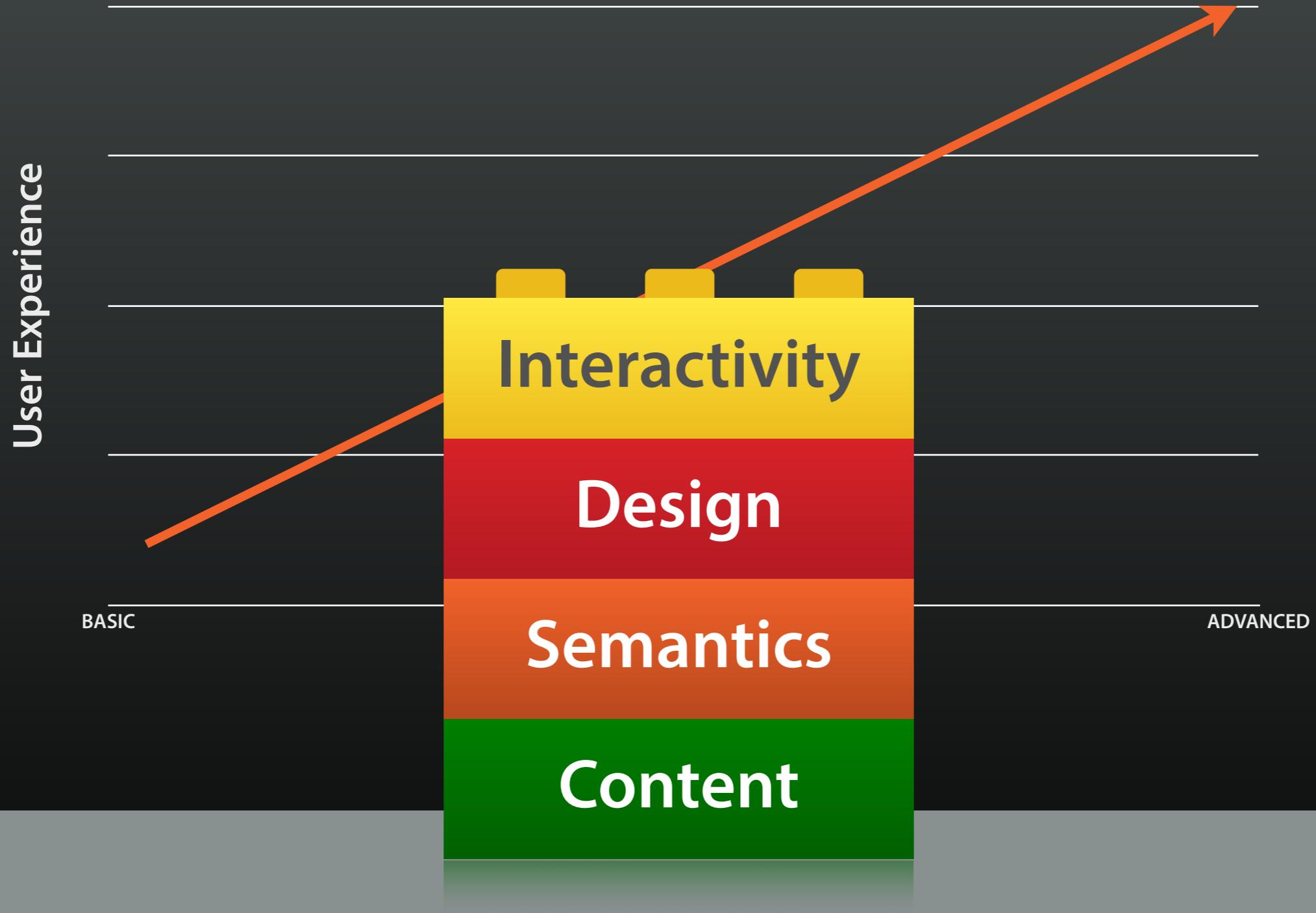
BASIC

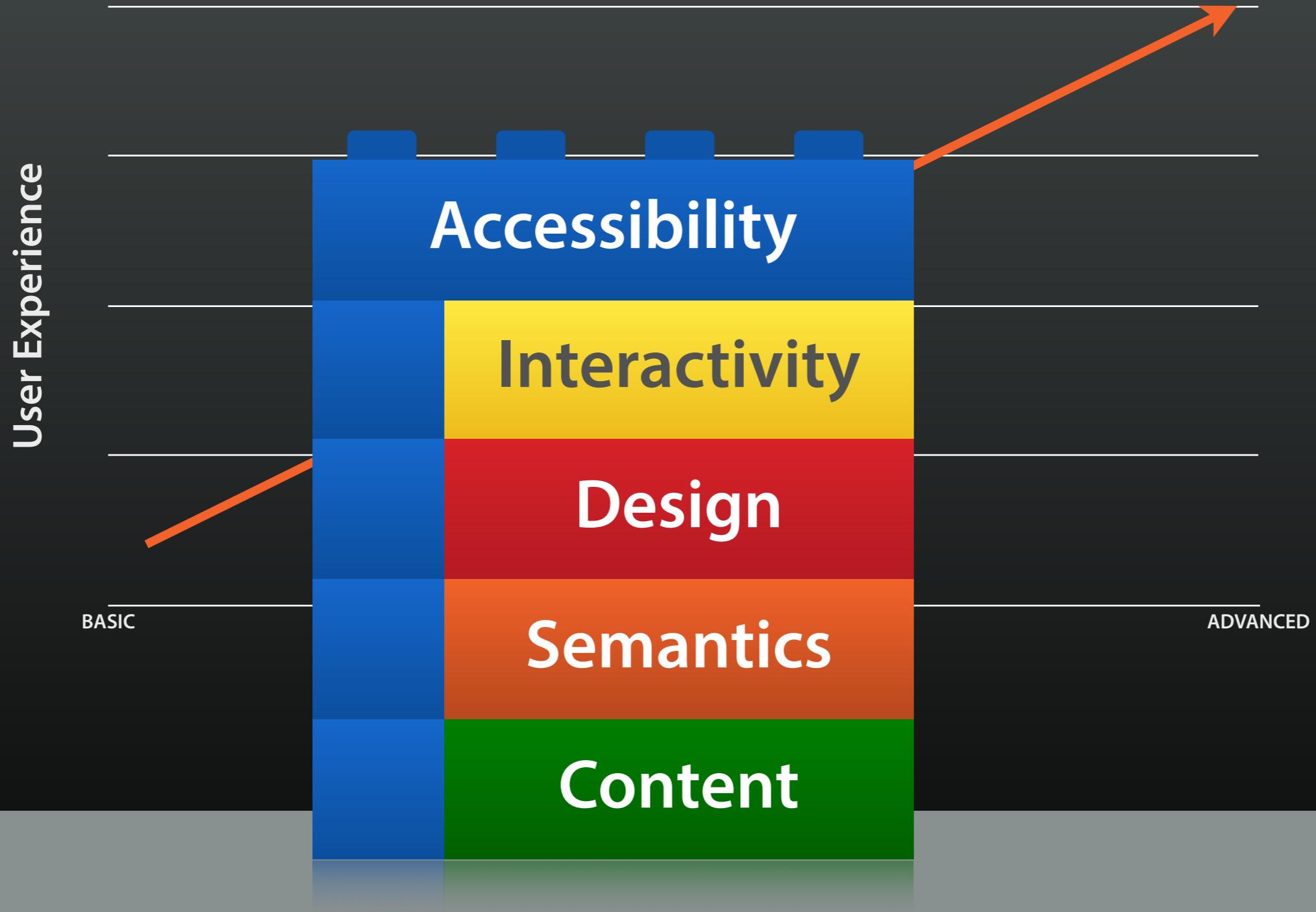
ADVANCED

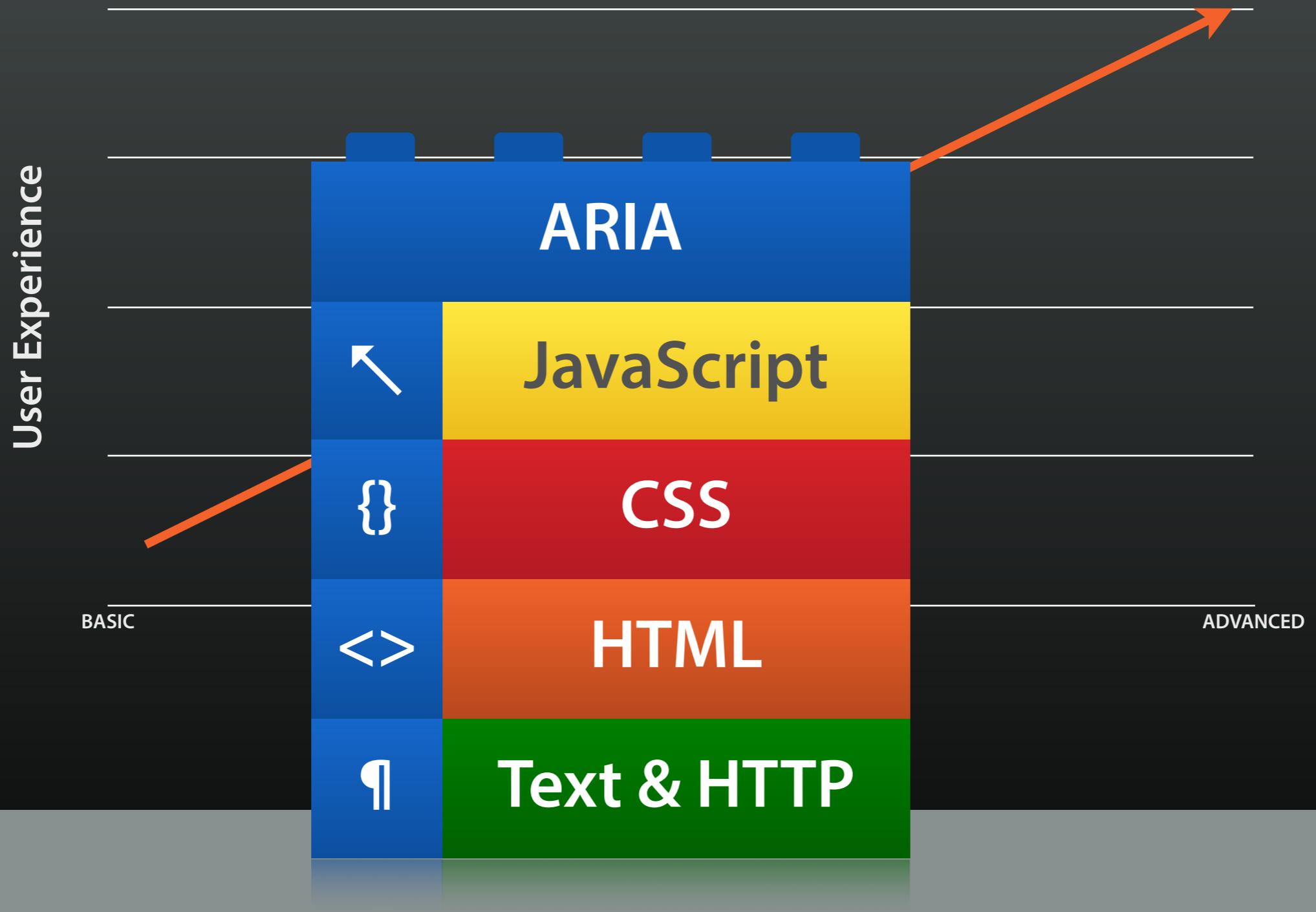














HTML

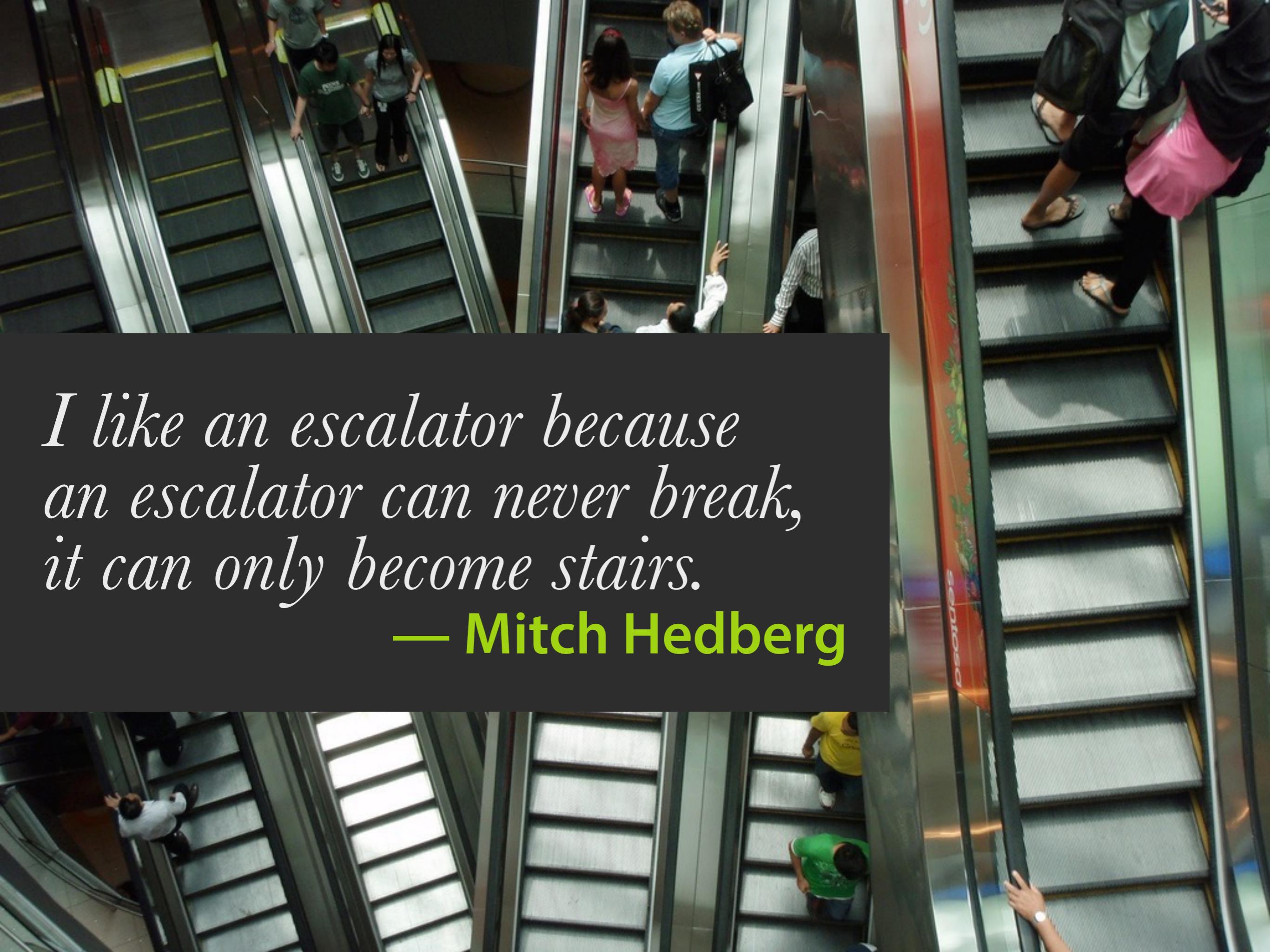
HTML5

The diagram consists of three horizontal orange rectangles of equal height, centered on a dark gray background. Above the top rectangle are three smaller, rounded rectangular blocks of the same orange color, arranged horizontally. A thin black horizontal line runs across the middle of the top rectangle. Below the middle rectangle is another thin black horizontal line. The bottom rectangle has no top border. The word "HTML5" is written in white, sans-serif capital letters in the center of the top rectangle. The word "Microformats" is written in white, sans-serif capital letters in the center of the middle rectangle. The word "HTML4" is written in white, sans-serif capital letters in the center of the bottom rectangle.

Microformats

HTML4

Browsers **ignore**
what they don't
understand



*I like an escalator because
an escalator can never break,
it can only become stairs.*

— Mitch Hedberg

Graceful Degradation

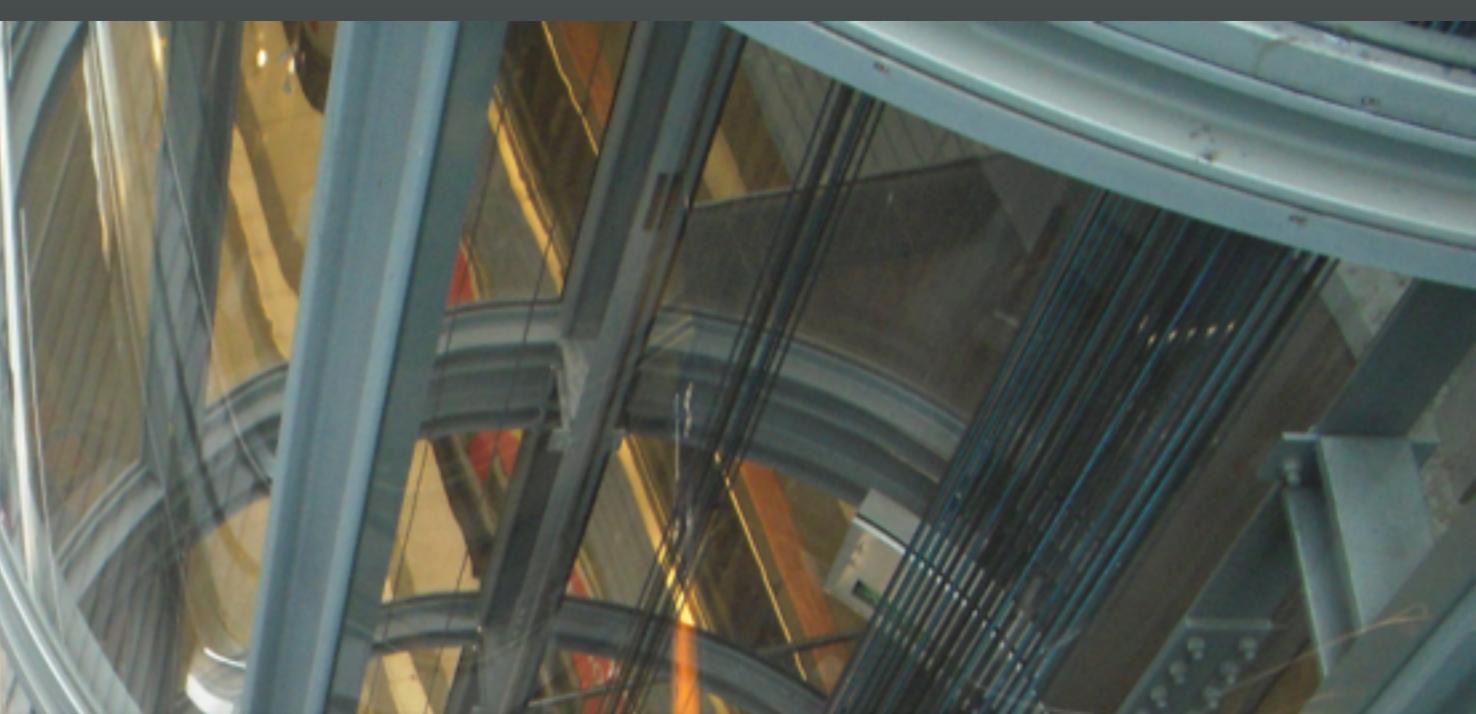
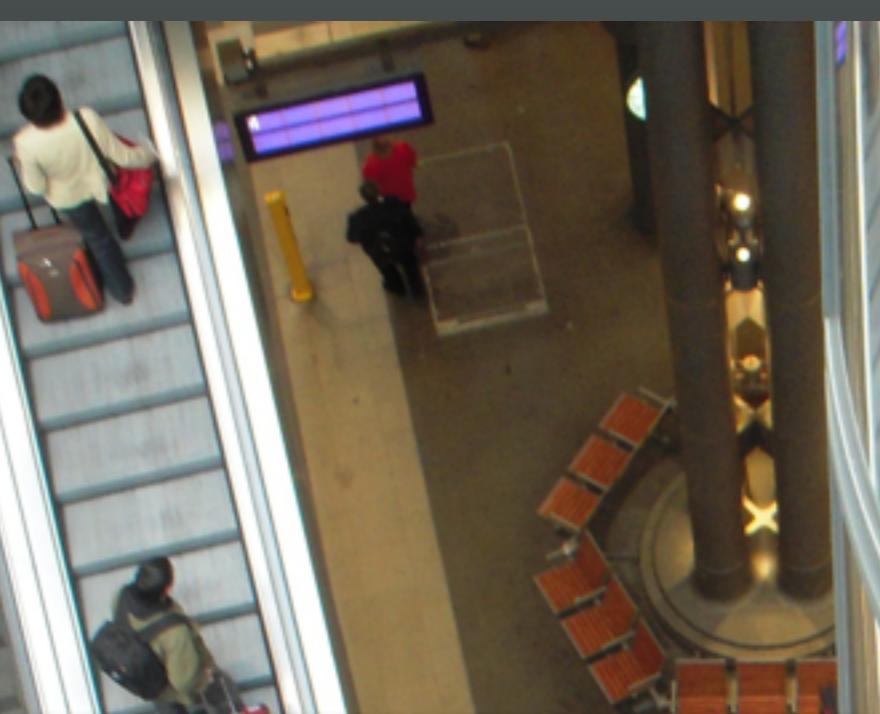
Modern Browsers



Older Browsers

Modern Browsers





Andrew Wight
@AndrewUX

Progressive enhancement is an escalator that becomes stairs.
Graceful degradation is building a lift then having to add
stairs.

14 May 12



Reply



Retweet



Favorite



WEEKENDHACKER

WEEKENDHACKER

Make the Best of Your Travel Plans This Weekend

The holidays are upon us, and if you're going to spend them you're probably going to be dealing with the stress that is travel tips for making travel as pain-free as possible. [More »](#)

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- [Discover Some New Music This Weekend](#)
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WEB SITES



TAXES



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£10 OFF
your first
online shop*

Start saving

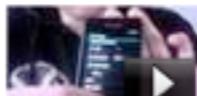
www.tesco.com

*When you spend £50 or more. Excludes delivery charge. Terms here.



WEEKENDHACKER

Make the Best of Your Travel Plans This Weekend



FOR WHAT IT'S WORTH

Remains of the Day: Ice Cream Sundae Recipe - 01/11/11 04:00 PM

a dynamic web page can never break, it can only become a web page.

[» The Ultimate Black Friday Gadget](#)

MORE STORIES...

[App Deals](#)

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TIPS AND DOWNLOADS FOR
GETTING THINGS DONE

[MORE STORIES...](#)

lifehacker

TOP STORY



LATEST

LOGIN





- Bugs
- Browser Add-ons
- Overzealous Firewalls
- Underpowered devices
- Page is still loading



112



EDGE

HTTP Error 413: Request Entity Too Large

The page you requested could not be loaded. Please try loading a different page.

OK

Details

Loading...

Sky's internet service mistakenly blocks web-critical plugin

Sky blocked jQuery, a plugin crucial to the operation of many of the internet's biggest websites, after wrongly classifying it as malware on Sunday night

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Technology

Web filtering · Internet · Broadband · Malware

Media

BSkyB

Business

BSkyB

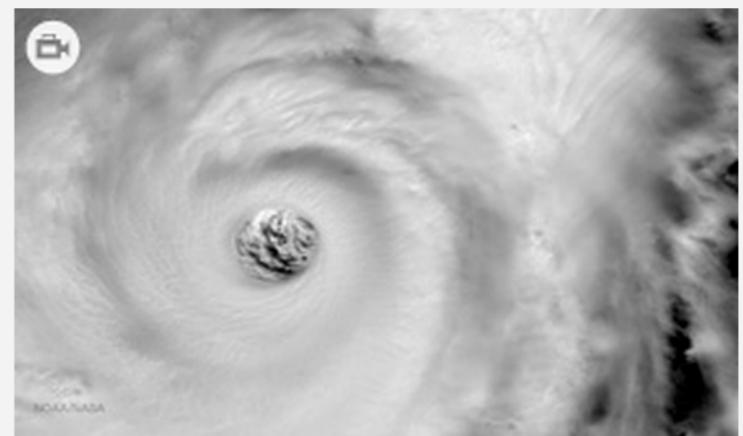
More news

More on this story



BSkyB signs new five-year deal for exclusive rights to HBO TV catalogue
Broadcaster struck

Today's best video



Japan's Typhoon Vongfong seen from International Space Station - video

Nasa footage shows the powerful eye of Typhoon Vongfong as it makes its way towards Okinawa, Japan



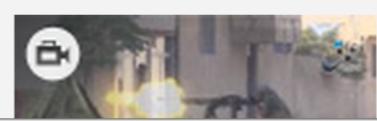
Ukrainian Darth Vader makes election run

Who knew Star Wars villain Darth Vader was in fact a Ukrainian Cossack at heart?



Robotic suit helps explore ancient wreck

New artifacts found in Greek island shipwreck, which sank in first century BC



Isis video 'shows street battle in Kobani'

Video posted on social



Parts of the web were broken after a crucial plugin was mistakenly blocked.

Photograph: Culture RM/Alamy

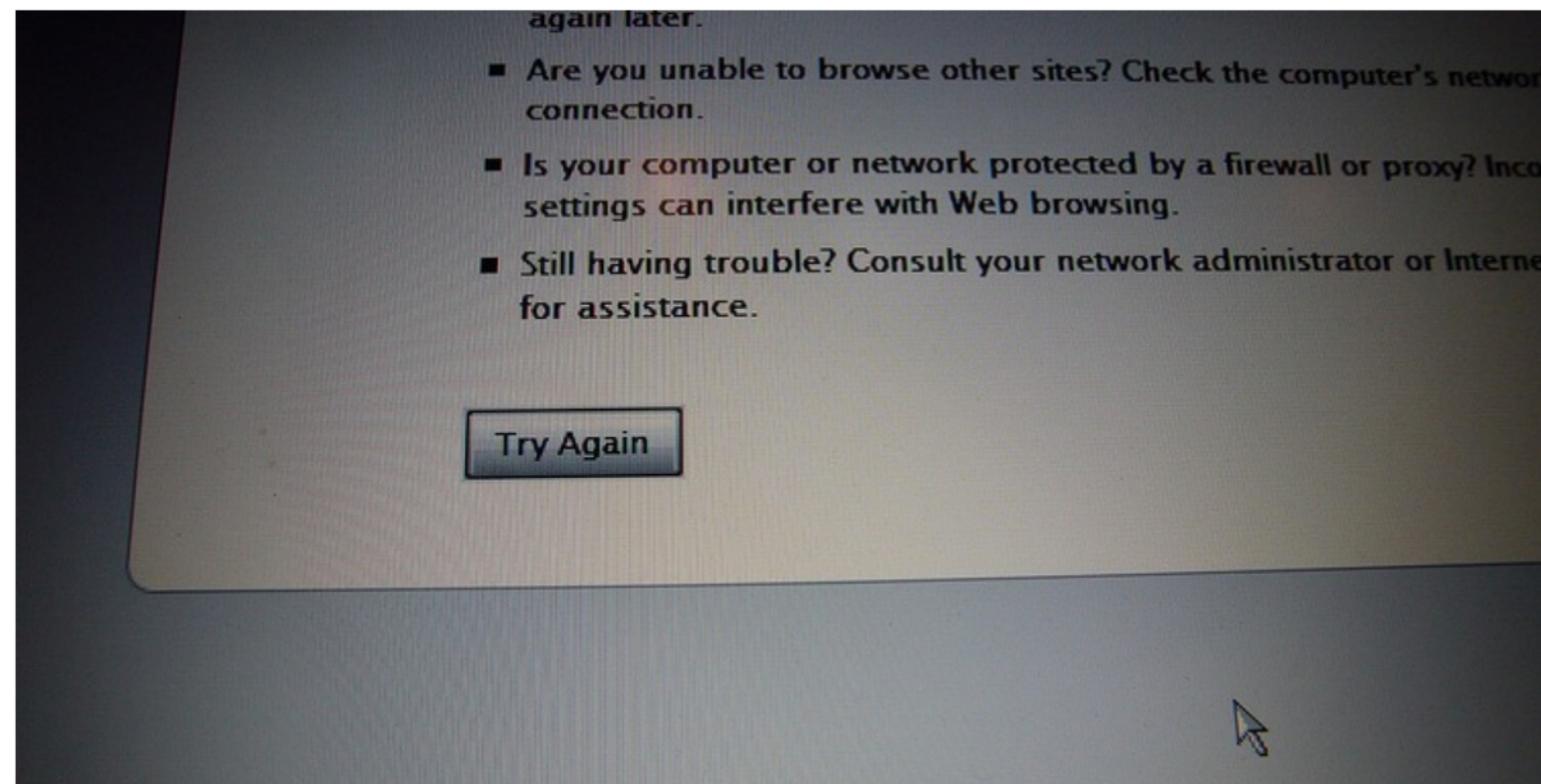
The Switch

FCC to Marriott: No, you can't force your customers onto terrible hotel WiFi

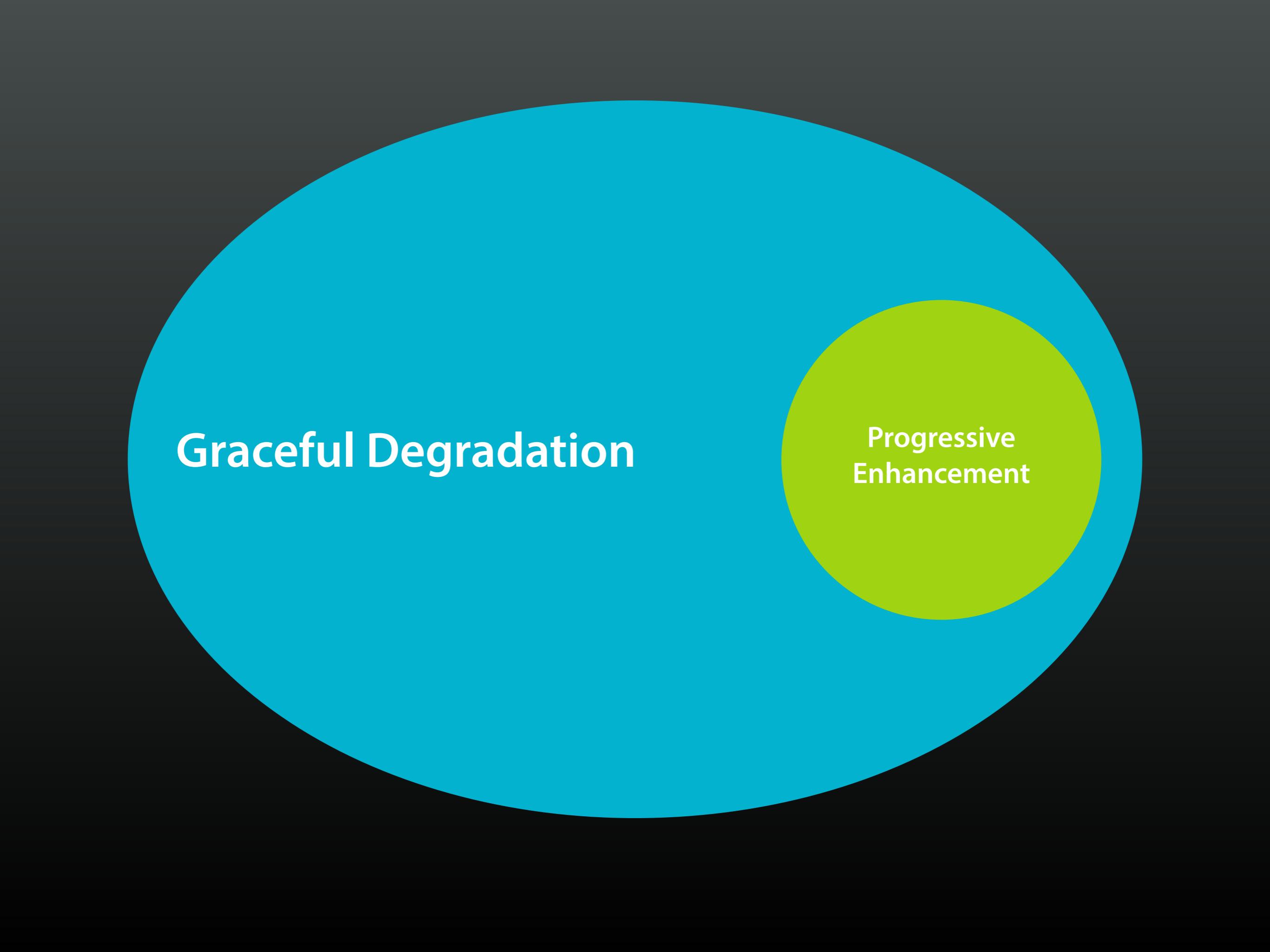


By Brian Fung October 3

Advertisement

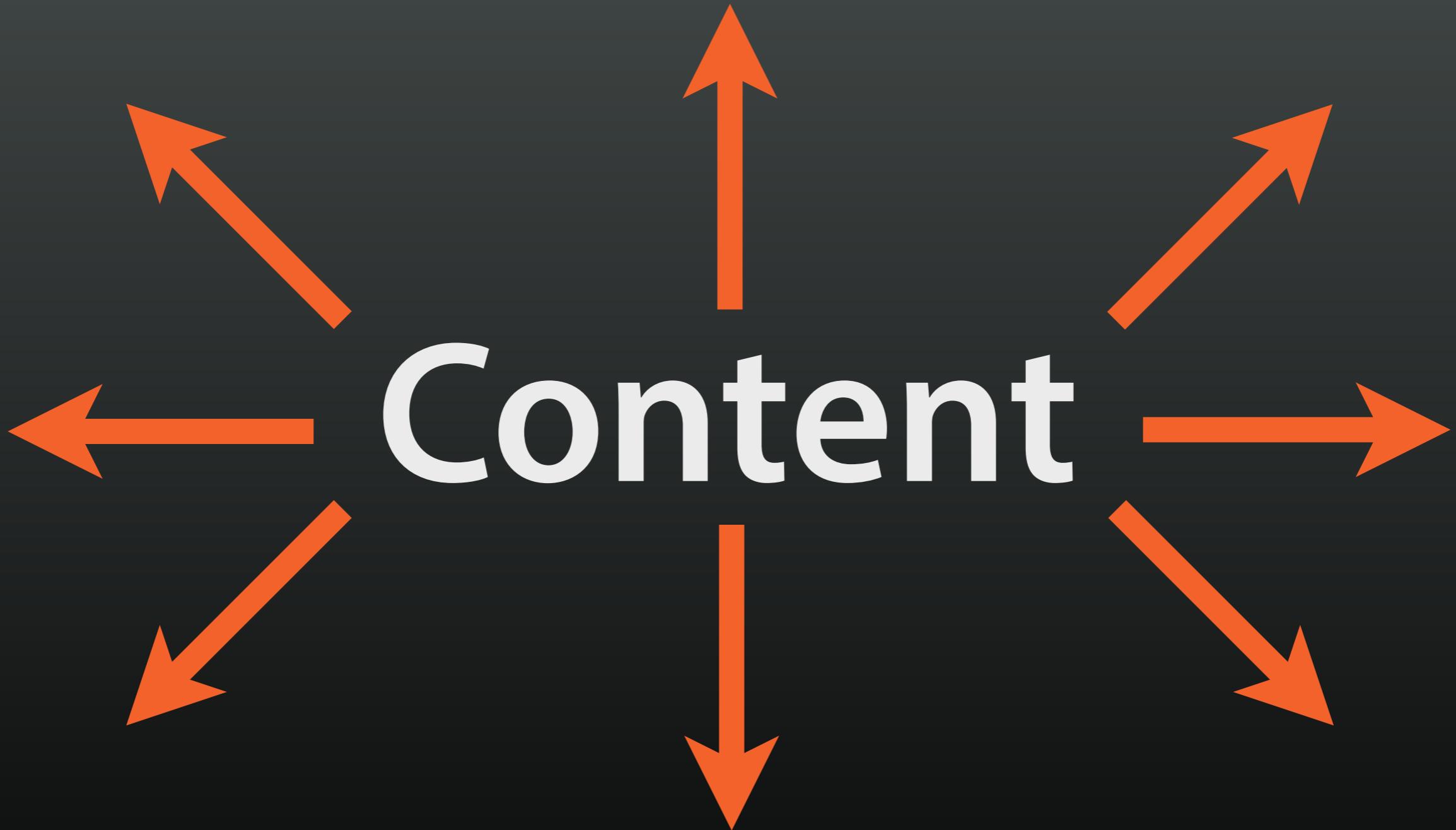


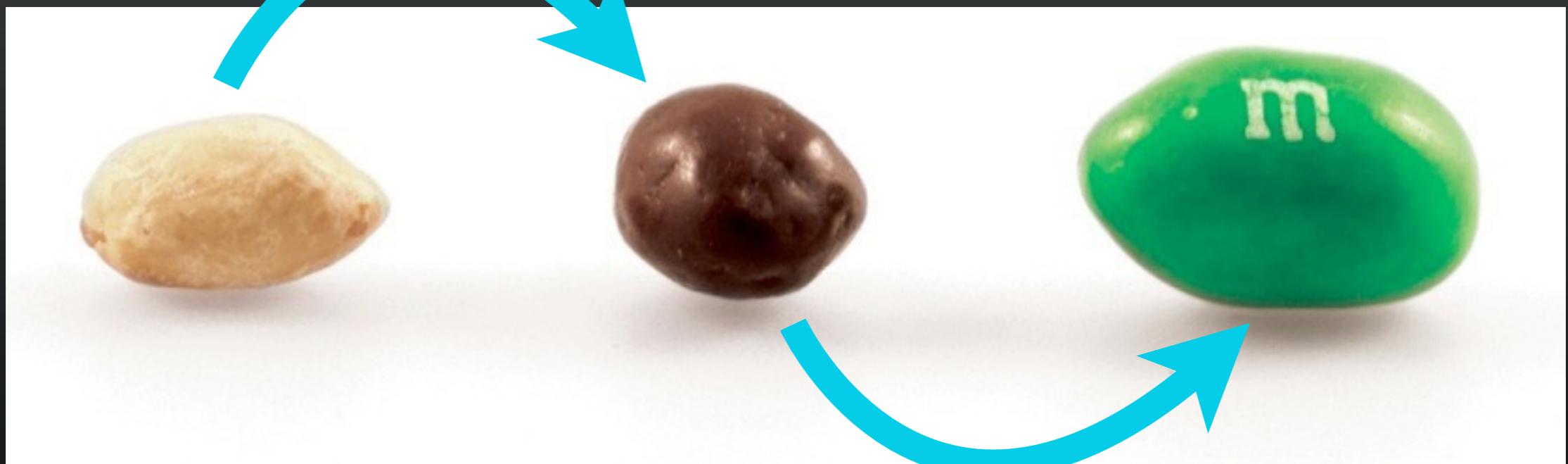
SPOF



Graceful Degradation

Progressive
Enhancement





**YOU MUST BE THIS TALL
TO RIDE WITH AN ADULT**



:-)

A Venn diagram consisting of two overlapping circles. The left circle is yellow and labeled "Responsive Web Design". The right circle is teal and labeled "Mobile First". The two circles overlap in the center, where a white downward-pointing arrow is located. Above the arrow is a white smiley face emoticon (:-)).

**Responsive
Web Design**

**Mobile
First**

Lightboxes



CLICK TO ENLARGE

Retreats 4 Geeks

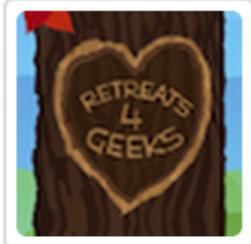
We built this site for our intimate retreat series.

Our curriculum is created for today's practitioner, integrating instruction in web standards with new technologies and emerging trends in both design and development.

Our facilitators are giants in the field, with years of hands-on experience in the trenches and the classroom.

Our approach to teaching is dynamic, like the web, and at the heart of it all is our love for sharing best practices.

Lightboxes



CLICK TO ENLARGE

Retreats 4 Geeks

We built this site for our intimate retreat series.

Our cur-
instruction
trends in

Our faci-
experien

Our app-
of it all is



Retreats 4 Geeks

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IxMap



IxMap

Load



Retreats 4 Geeks

We built this site for our intimate retreat series.

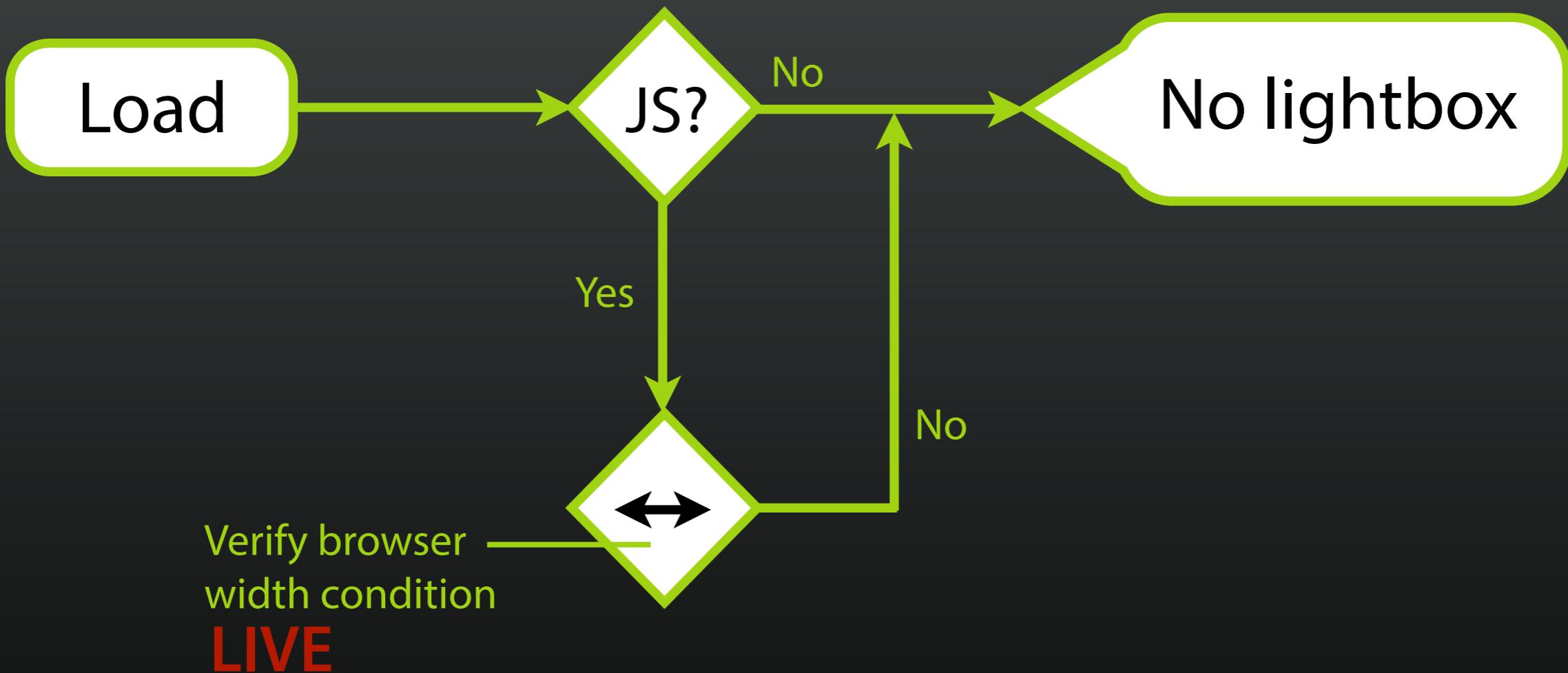
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Lightbox

IxMap



IxMap

Load

Verify
width
co

LIVE



Retreats 4 Geeks

We built this site for our intimate retreat series.

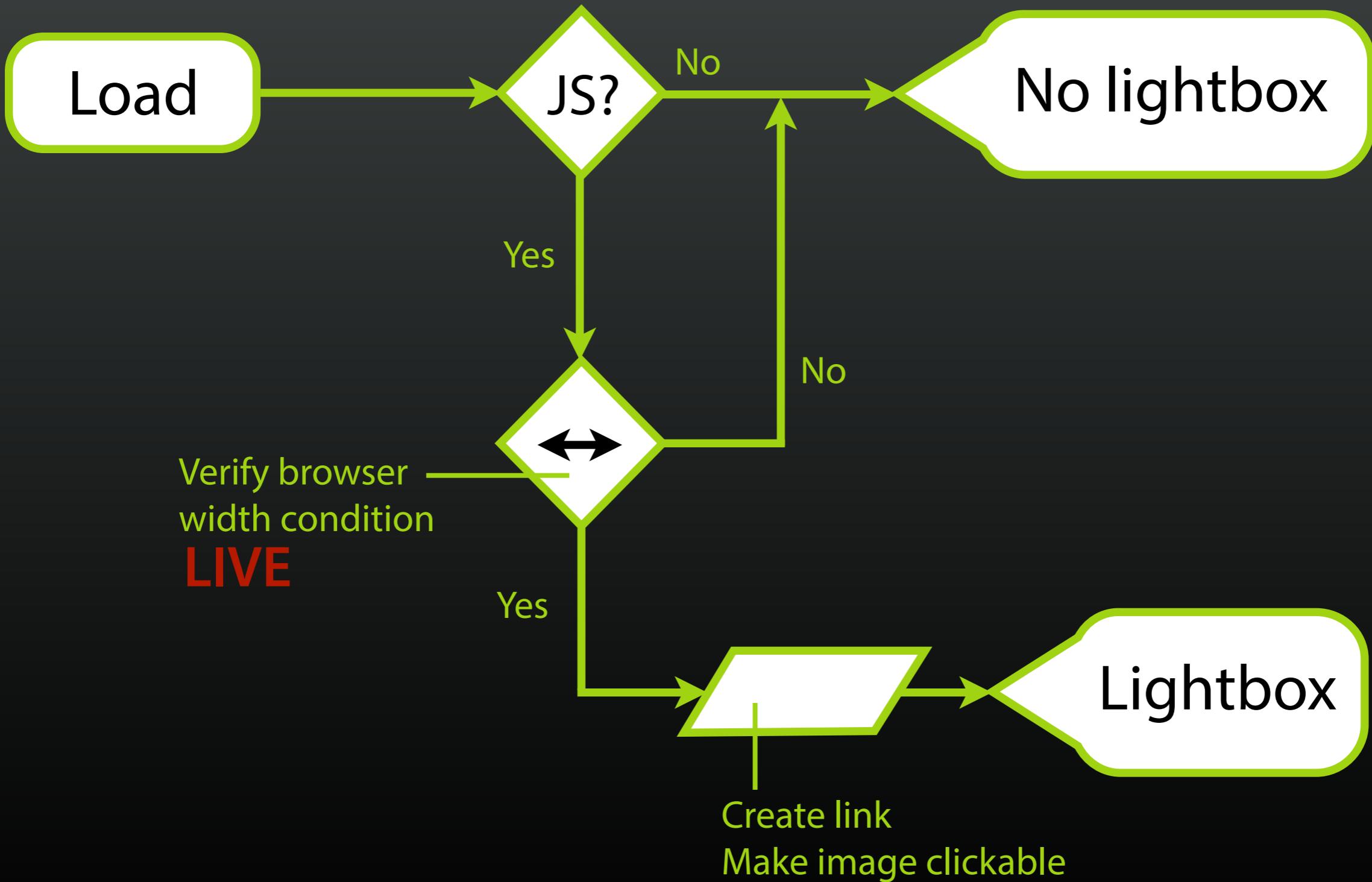
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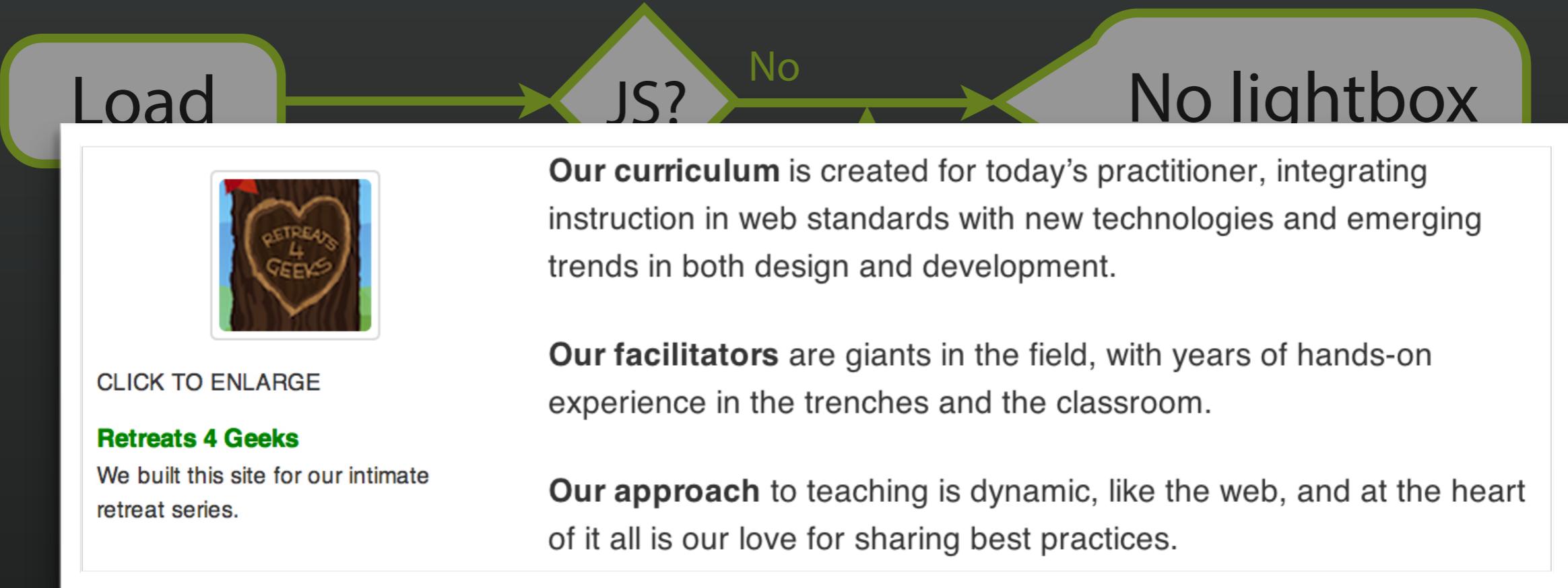
Our approach to teaching is dynamic, like the web, and at the heart of it all is our love for sharing best practices.

Lightbox

IxMap



IxMap



LIVE

Yes

Create link
Make image clickable

Lightbox

No need to link

```
<figure id="fig-1">
  
  <figcaption>
    <h6>Retreats 4 Geeks</h6>
    <p>We built this site for our intimate retreat series.</p>
  </figcaption>
</figure>
```

Make the connection

```
<figure id="fig-1">
  
  <p class="enlarge"><a href="#enlarge">Click to
    Enlarge</a></p>
  <figcaption>
    <h6>Retreats 4 Geeks</h6>
    <p>We built this site for our intimate retreat series.</p>
  </figcaption>
</figure>
```

Lightboxes



CLICK TO ENLARGE

Retreats 4 Geeks

We built this site for our intimate retreat series.

Our cur-
instruction
trends in

Our faci-
experien

Our app-
of it all is



Retreats 4 Geeks

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Thumbnails

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 SPORTS > VOLS
Martin excited about Vols' summer progress
Some Vols are working out in Knoxville while others are competing across the globe, but Cuonzo Martin likes how his team is progressing this summer ...

By Daniel Lewis
2 hours ago

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 SPORTS > MOCs
ESPN3 to broadcast three UTC football games in 2013
The Southern Conference revealed its eight-game football package with ESPN3 for the 2013 season on Monday, and Chattanooga will have three of its games broadcast over the online network ...

By Staff Report
3 hours ago

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 SPORTS > OUTDOORS
Trucks and Ducks fundraiser is June 27
The Chattanooga chapter of Ducks Unlimited will host Trucks and Ducks 2013 at Mountain View Ford on

By Richard Simms
5 hours ago

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By Daniel Lewis
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By Daniel Lewis
2 hours ago

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IxMap



IxMap



SPORTS > VOLS

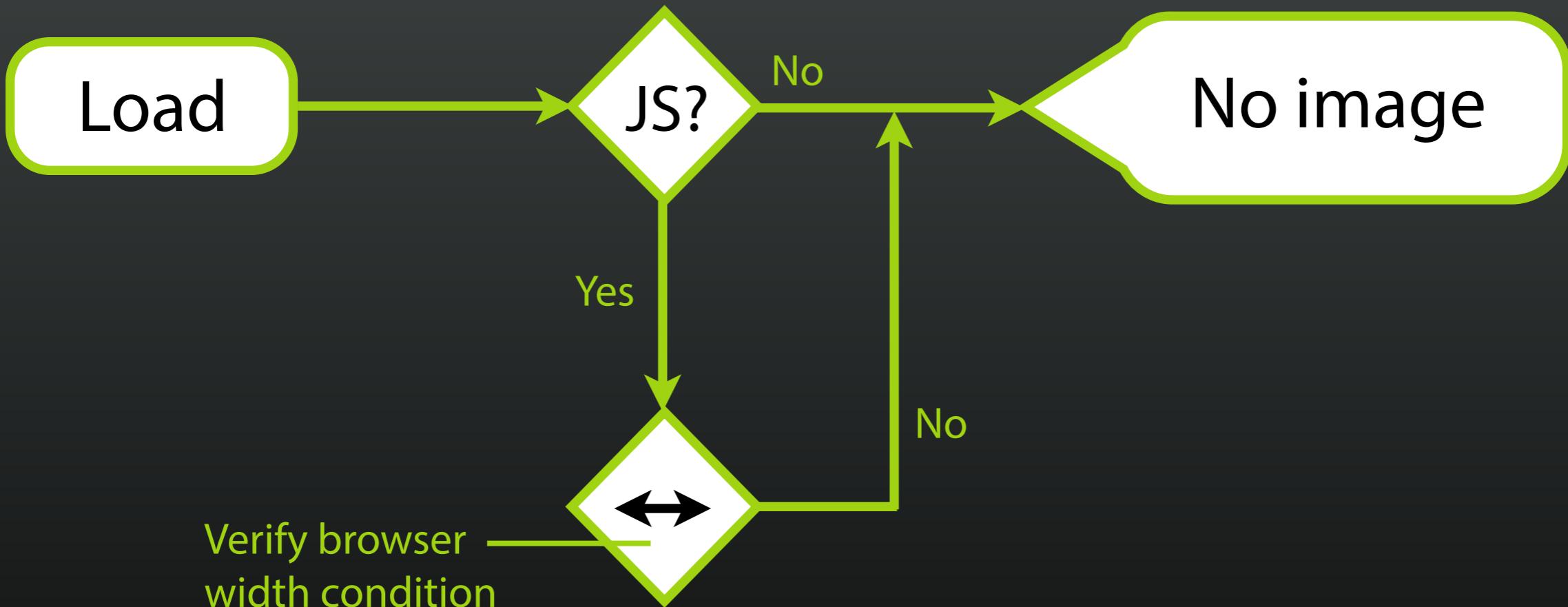
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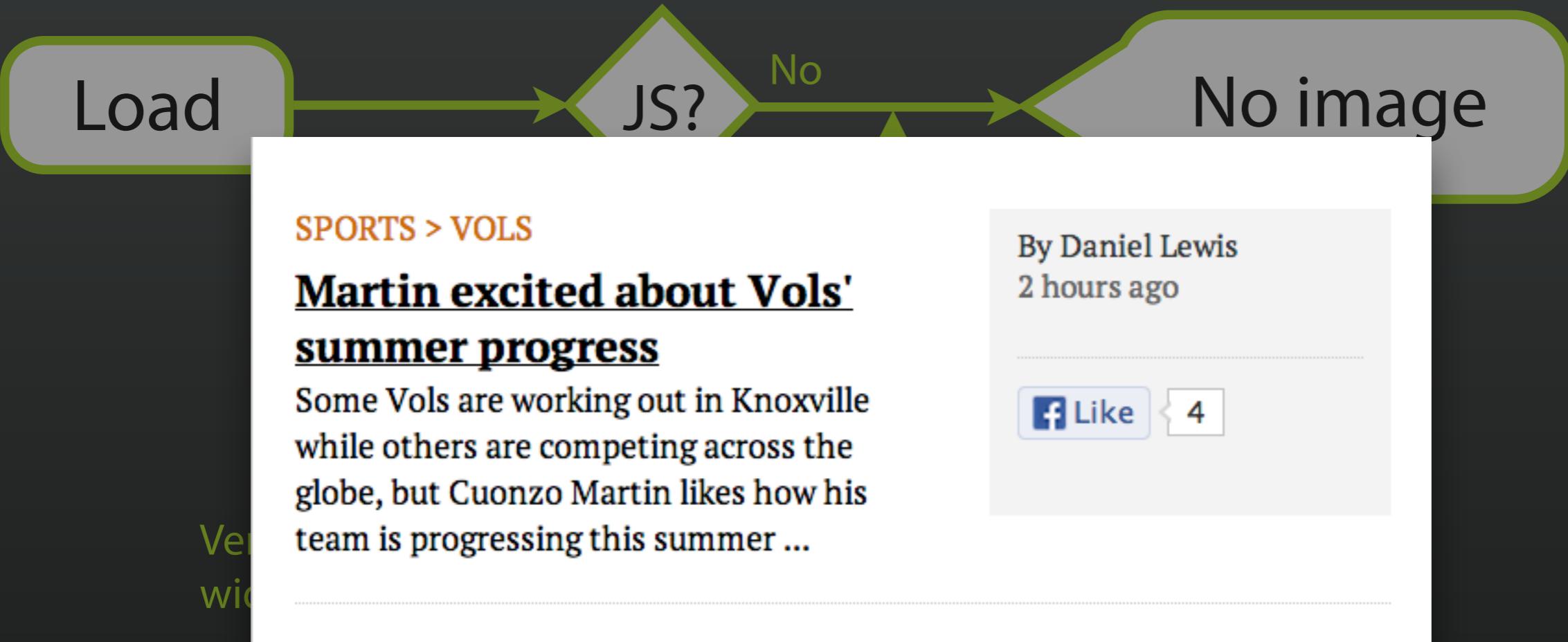
By Daniel Lewis
2 hours ago

 4

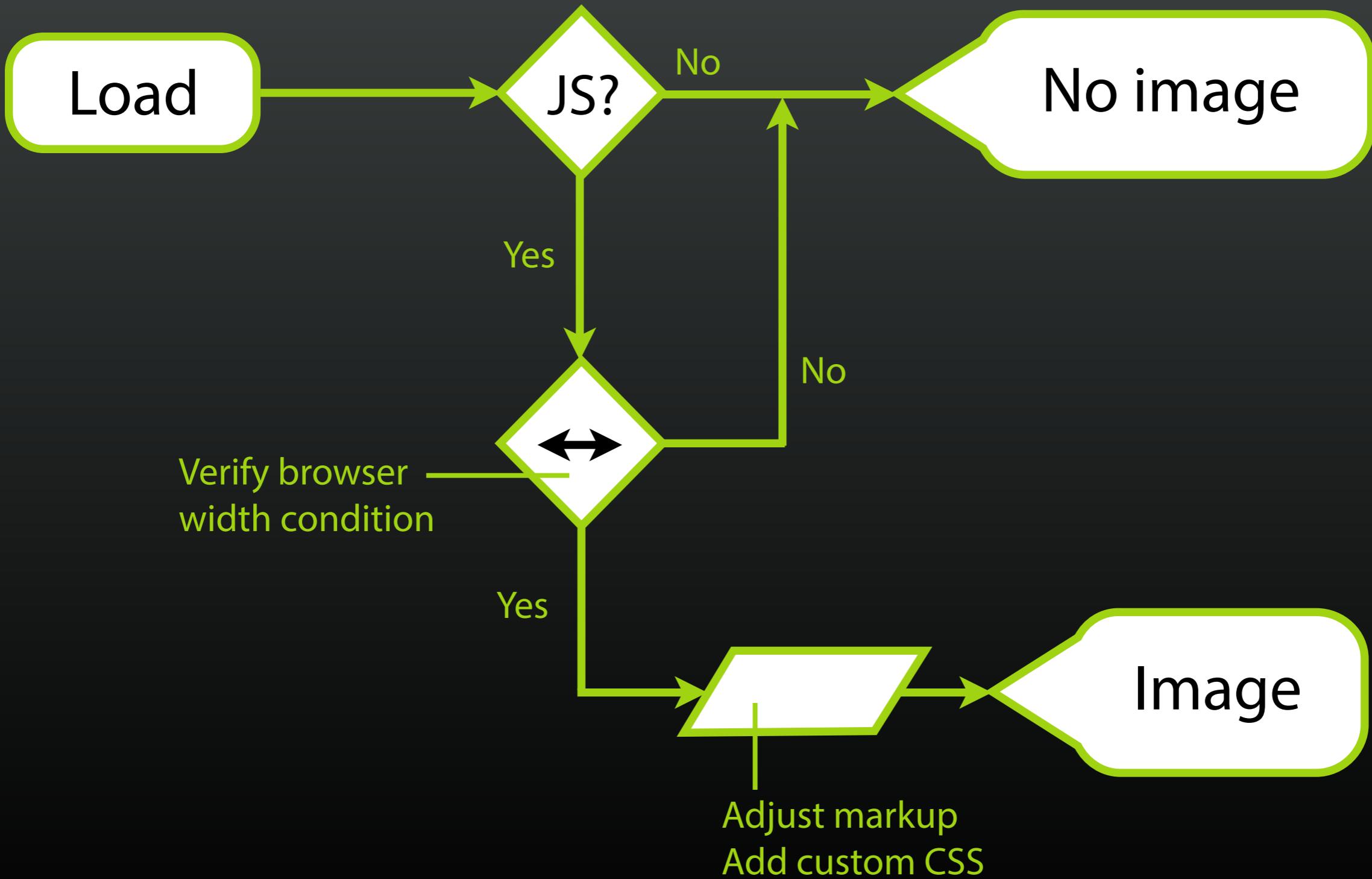
IxMap



IxMap



IxMap



IxMap



Adjust markup
Add custom CSS



Load

Latest News

view as:

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By Staff Report
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SPORTS > OUTDOORS

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By Richard Simms
5 hours ago[f Like](#) 1

SPORTS > OUTDOORS

Riverwalk Bird of the Week: Canada goose

The folks in the Riverwalk Bird Club don't just watch birds. The group includes some excellent photographers. ...

By Staff Report
5 hours ago[f Like](#) 0

There is no image...

```
<p class="entry-image"  
    data-image-src="/i/sample.jpg"></p>
```

Until there is

```
<p class="entry-image"  
    data-image-src="/i/sample.jpg"></p>
```



```
<p class="entry-image"  
    data-image-src="/i/sample.jpg"  
    data-has-image="true">  
      
</p>
```

CSS at rest

```
[data-image-src] {  
    display: none;  
}
```

CSS at play

```
[data-image-src][data-image-loaded] {  
    display: block;  
}
```

JS Watcher

```
window.watchResize = function(callback)
{
    var resizing;
    function done() {
        clearTimeout( resizing );
        resizing = null;
        callback();
    }
    window.onresize = function(){
        if ( resizing ) {
            clearTimeout( resizing );
            resizing = null;
        }
        resizing = setTimeout( done, 50 );
    };
    callback();
};
```

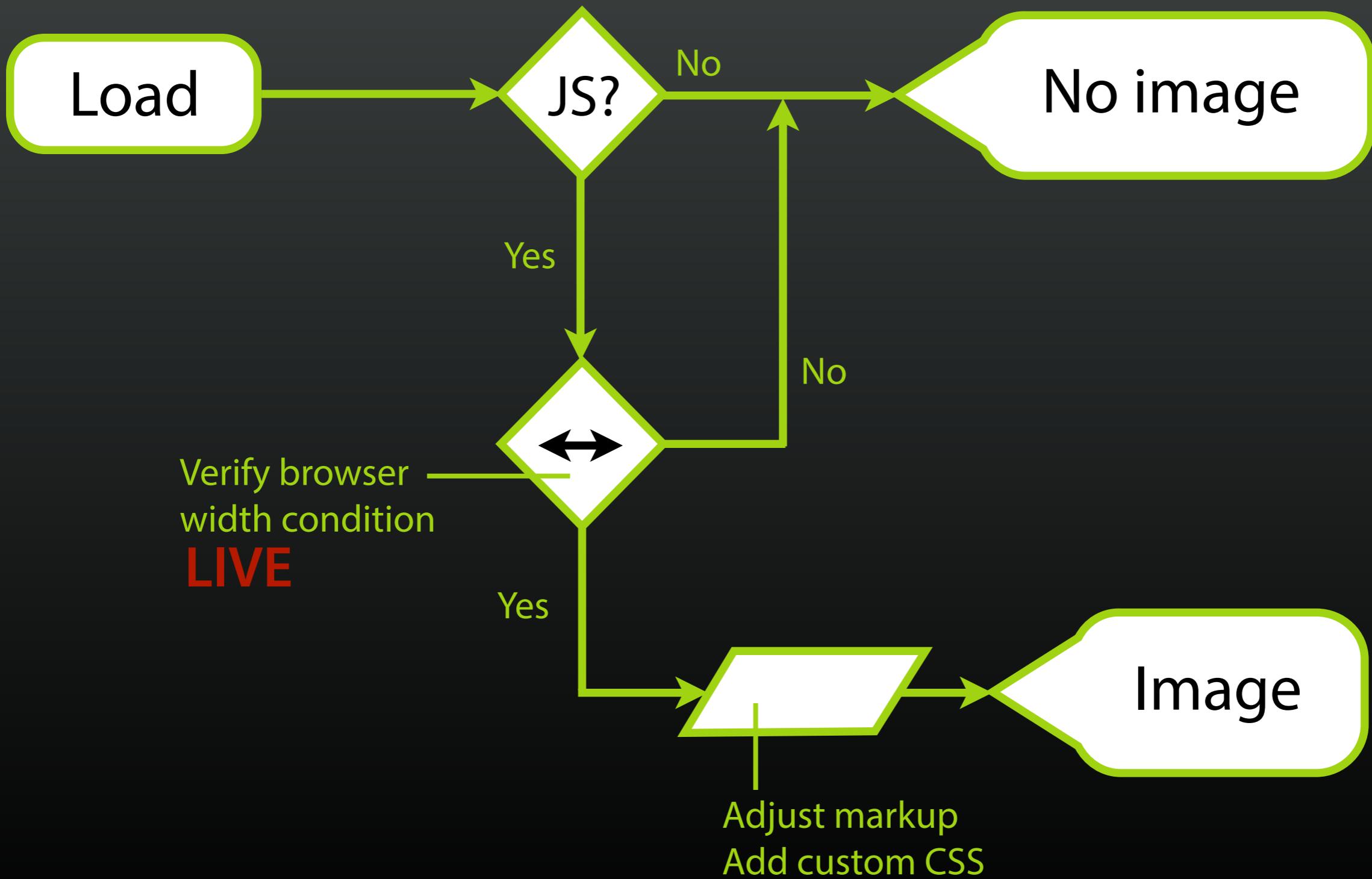
JS Watcher

```
var browser_width = 0;  
window.watchResize(function(){  
    browser_width = window.innerWidth ||  
                    document.body.offsetWidth;  
});
```

JS Watcher

```
window.watchResize(function(){
  var threshold = 400,
      image = document.createElement('img'),
      paragraphs = document.getElementsByTagName('p'),
      i = paragraphs.length,
      p, loaded, src, img;
  if ( browser_width >= threshold ) {
    image.setAttribute('alt','');
    while ( i-- ) {
      p = paragraphs[i];
      src = p.getAttribute('data-image-src');
      loaded = p.getAttribute('data-image-loaded');
      if ( src != null && loaded == null ) {
        img = image.cloneNode(true);
        img.setAttribute('src',src);
        p.appendChild( img );
        p.setAttribute('data-image-loaded','');
      }
    }
    image = paragraphs = p = img = null;
  }
});
```

IxMap



Smart CSS

```
[data-image-src][data-image-loaded] {  
    display: block;  
}
```

Smart CSS

```
[data-image-src][data-image-loaded] {  
    display: block;  
}
```



```
@media only screen and (min-width:400px) {  
    [data-img-src][data-image-loaded] {  
        display: block;  
    }  
}
```

Thumbnails



SPORTS > VOLS

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2 hours ago

[f Like](#) { 4 }



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By Daniel Lewis
2 hours ago

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Super Ffly T-shirt

\$23 ★★★★☆ 8 Reviews



QTY

1

SIZE

S



ADD TO CART

SHARE FIND NEARBY

http://is.gd/lazyLoading_demo



Super Ffly T-shirt

\$23 ★★★★☆ 8 Reviews

QTY

1

SIZE

S

ADD TO CART

SHARE FIND NEARBY

Behold, your new favorite shirt! This built-to-last tee adapts to your size and capabilities, starting off XS then stretches and scales to keep you comfortable as you grow taller and wider. The future is here, so look sharp.

Similar T-shirts

SIMILAR T-SHIRTS

http://is.gd/lazyloading_demo



QTY

1

SIZE

S



ADD TO CART

SHARE FIND NEARBY

Behold, your new favorite shirt! This built-to-last tee adapts to your size and capabilities, starting off XS then stretches and scales to keep you comfortable as you grow taller and wider. The future is here, so look sharp.

Similar T-shirts



8 Reviews



T-SHIRTS

HOODIES

PANTS

http://is.gd/lazyLoading_demo

Similar T-shirts



Annotations:
OFF

8 Reviews



★★★★★

Awesome shirt!

11/12/2011 By Bruce Bosco

This shirt looks awesome and is really comfortable to wear. It did shrink quite a lot when washed, but that could have just been how I ran it. All in all, it's my favourite shirt, and I love wearing it.



★★★★★

Nice shirt

11/12/2011 By Nick McKinsey

This shirt is a great addition to any simple wardrobe. Can be worn by itself or complimented with accessories. Nice and soft to the touch!

http://is.gd/lazyLoading_demo

NO!!!!

```
#reviews {  
  display: none;  
}  
  
@media only screen and (min-width:50em) {  
  #reviews {  
    display: block;  
  }  
}
```

IxMap



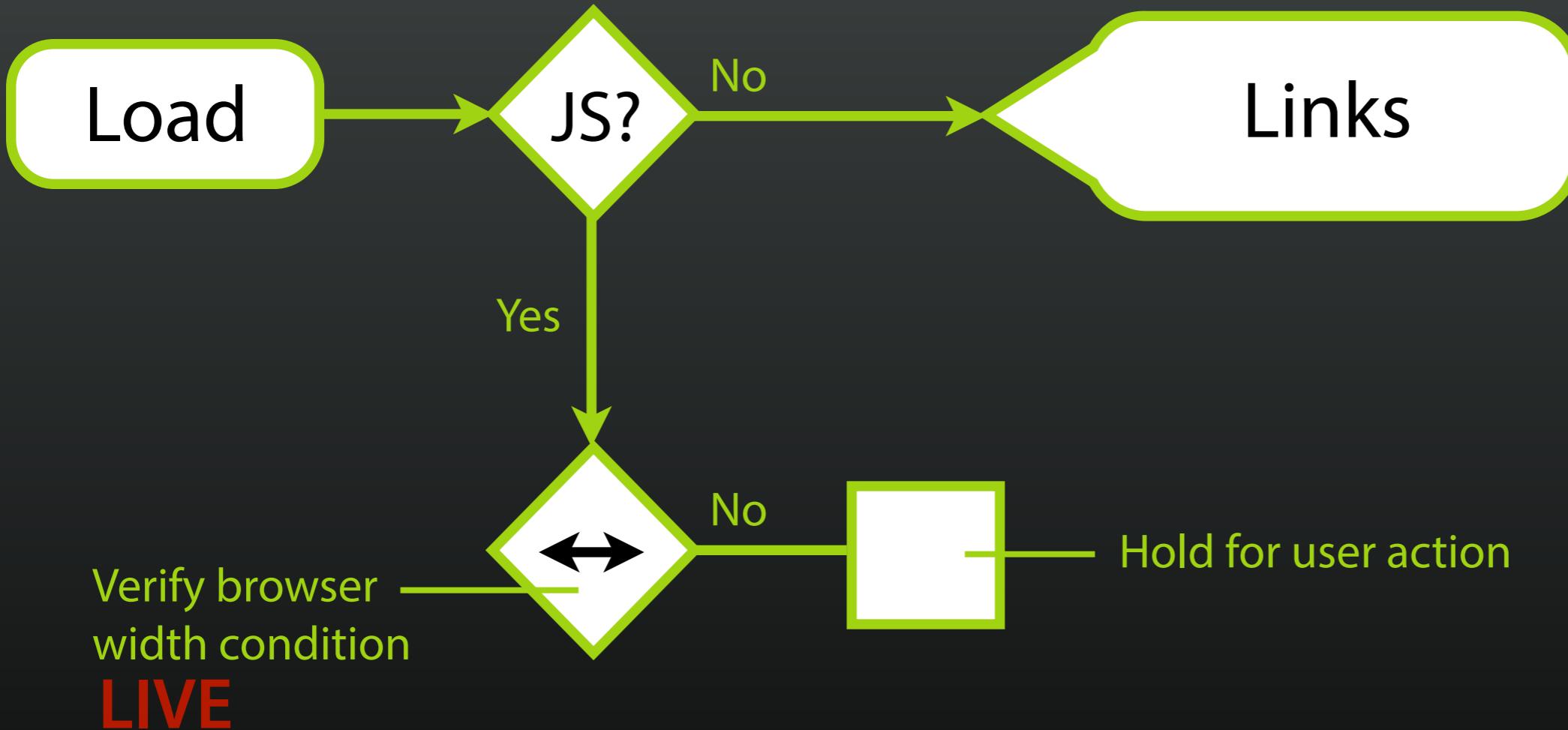
IxMap



8 Reviews ★★★★☆

+

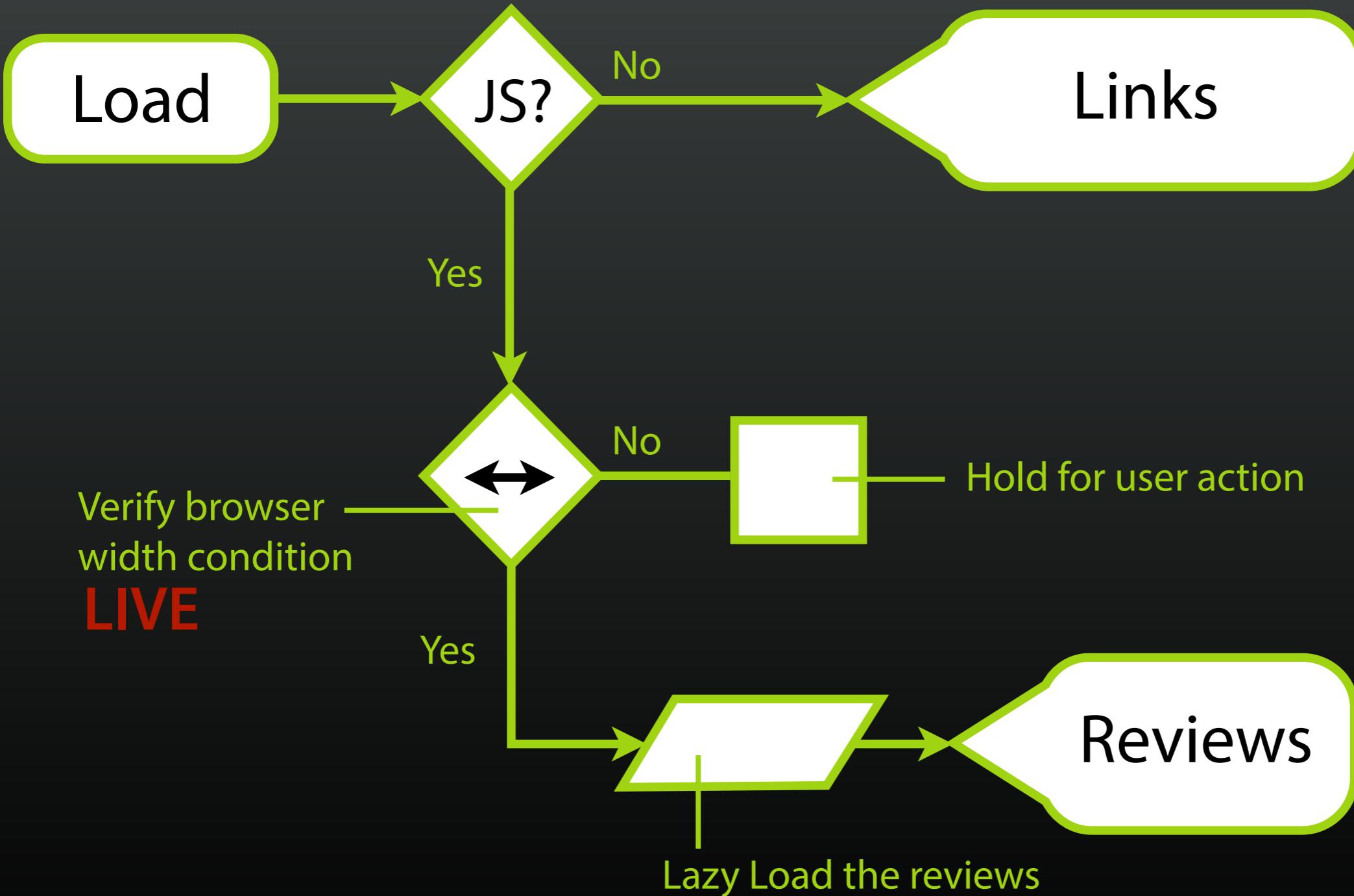
IxMap



IxMap



IxMap



IxMap

No

Reviews

8 Reviews ★★★★☆

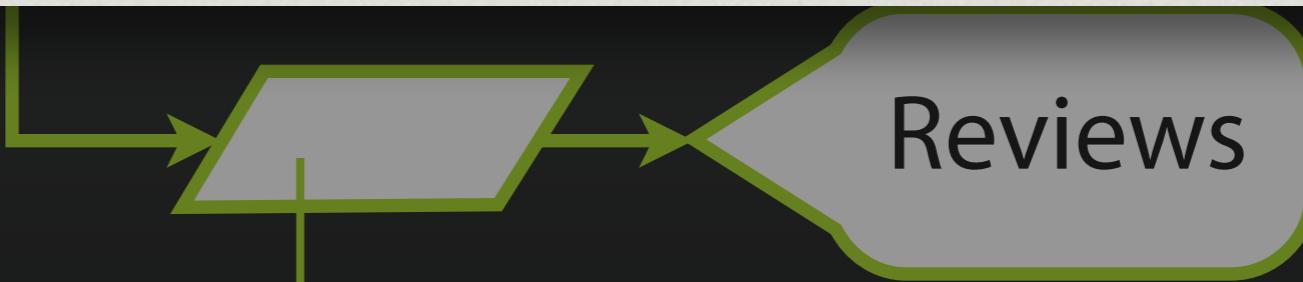
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 ★★★★☆
Nice shirt
11/12/2011 By Nick McKinsey

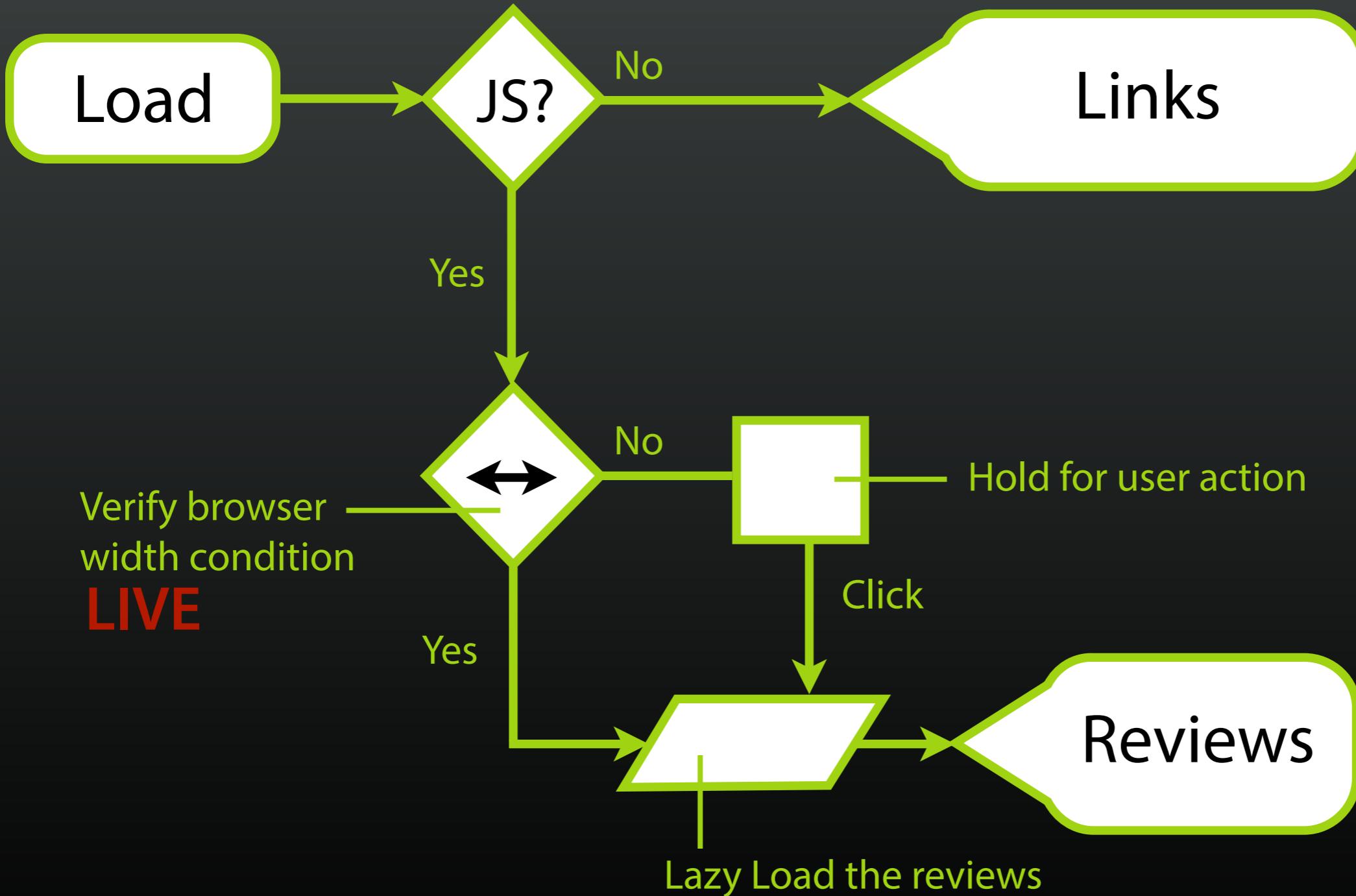
This shirt is a great addition to any simple wardrobe. Can be worn by itself or complimented with accessories. Nice and soft to the touch!

TCS



Lazy Load the reviews

IxMap



IxMap

Load

Verify browser
width condition
LIVE

8 Reviews ★★★★☆

 ★★★★☆
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 ★★★★☆
Nice shirt
11/12/2011 By Nick McKinsey

This shirt is a great addition to any simple wardrobe. Can be worn by itself or complimented with accessories. Nice and soft to the touch!

nks

User action

reviews

Lazy Loading

```
<section class="aux reviews" id="reviews">
  <header id="tab-reviews">
    <a href="reviews.html" class="disabled">...</a>
  </header>
</section>
```

Lazy Loading

```
<section class="aux reviews loaded" id="reviews">
  <header id="tab-reviews">
    <a href="reviews.html" class="disabled open">...</a>
  </header>
  <div role="tabpanel">
    <div id="p-reviews" aria-labeledby="tab-reviews">
      <ol class="reviews-list">
        <li>
          
          <div class="review-meta">
            <h3>Awesome shirt!</h3>
            <a href="#"><time datetime="2010-01-20" pubdate="">11/12/2011</time></a>
            By Bruce Bosco
          </div>
          <div class="review-content">
            <p>This shirt looks awesome and is really comfortable to wear. It did shrink quite a lot when washed, but that could have just been how I ran it. All in all, it's my favourite shirt, and I love wearing it.</p>
          </div>
        </li>
        <!-- ... -->
      </ol>
    </div>
  </div>
</section>
```

Super Ffly T-shirt

\$23 ★★★★☆ 8 Reviews



QTY

1

SIZE

S



ADD TO CART

SHARE FIND NEARBY

http://is.gd/lazyLoading_demo

Tabbed Interface

Pumpkin Pie

OVERVIEW

INGREDIENTS

DIRECTIONS

NUTRITION

Whether you're hosting a festive party or a casual get-together with friends, our Pumpkin Pie will make entertaining easy!

Original recipe yield: 1 × 9-inch deep dish pie

Prep Time: 10min

Cook Time: 1hr

Ready In: 1hr 10min



Traditional approach

```
<h1>Pumpkin Pie</h1>
<div class="container">
  <ul class="tabs">
    <li><a href="#">Overview</a></li>
    <li><a href="#">Ingredients</a></li>
    <li><a href="#">Directions</a></li>
    <li><a href="#">Nutrition</a></li>
  </ul>
  <div class="section">
    <h2>Overview</h2>
    
    <p>Whether you're hosting a festive party or a casual get-together with friends, our Pumpkin Pie will make entertaining easy!</p>
    <!-- ... -->
  </div>
  <!-- ... -->
</div>
```

Cleaner approach

```
<h1>Pumpkin Pie</h1>
<div class="tabbed-interface">
  <h2>Overview</h2>
  
  <p>Whether you're hosting a festive party or a casual
  get-together with friends, our Pumpkin Pie will make
  entertaining easy!</p>
  <!-- ... -->
  <h2>Ingredients</h2>
  <ul>
    <li>1 (9<abbr title="inch">in</abbr>) unbaked deep
      dish pie crust</li>
    <li> $\frac{1}{2}$  cup white sugar</li>
    <!-- ... -->
  </ul>
  <h2>Directions</h2>
  <!-- ... -->
</div>
```

Cleaner approach

```
<h1>Pumpkin Pie</h1>
<div class="tabbed-interface">
  <h2>Overview</h2>
  
  <p>Whether you're hosting a festive party or a casual
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    <!-- ... -->
  </ul>
  <h2>Directions</h2>
  <!-- ... -->
</div>
```

No JS, basic CSS

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INGREDIENTS

1 (9in) unbaked deep dish pie crust

½ cup white sugar

1 tsp ground cinnamon

½ tsp salt

½ tsp ground ginger

¼ tsp ground cloves

2 eggs

1 can (15oz) pumpkin puree

1 can (12fl oz) evaporated milk

DIRECTIONS

1. Preheat oven to 425°F
2. Combine sugar, salt, cinnamon, ginger and cloves in small bowl.
3. Beat eggs lightly in large bowl.
4. Stir in pumpkin and sugar-spice mixture.

IxMap



IxMap

Load

linear

Pumpkin Pie

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2 eggs

1 can (15oz) pumpkin puree

1 can (12fl oz) evaporated milk

DIRECTIONS

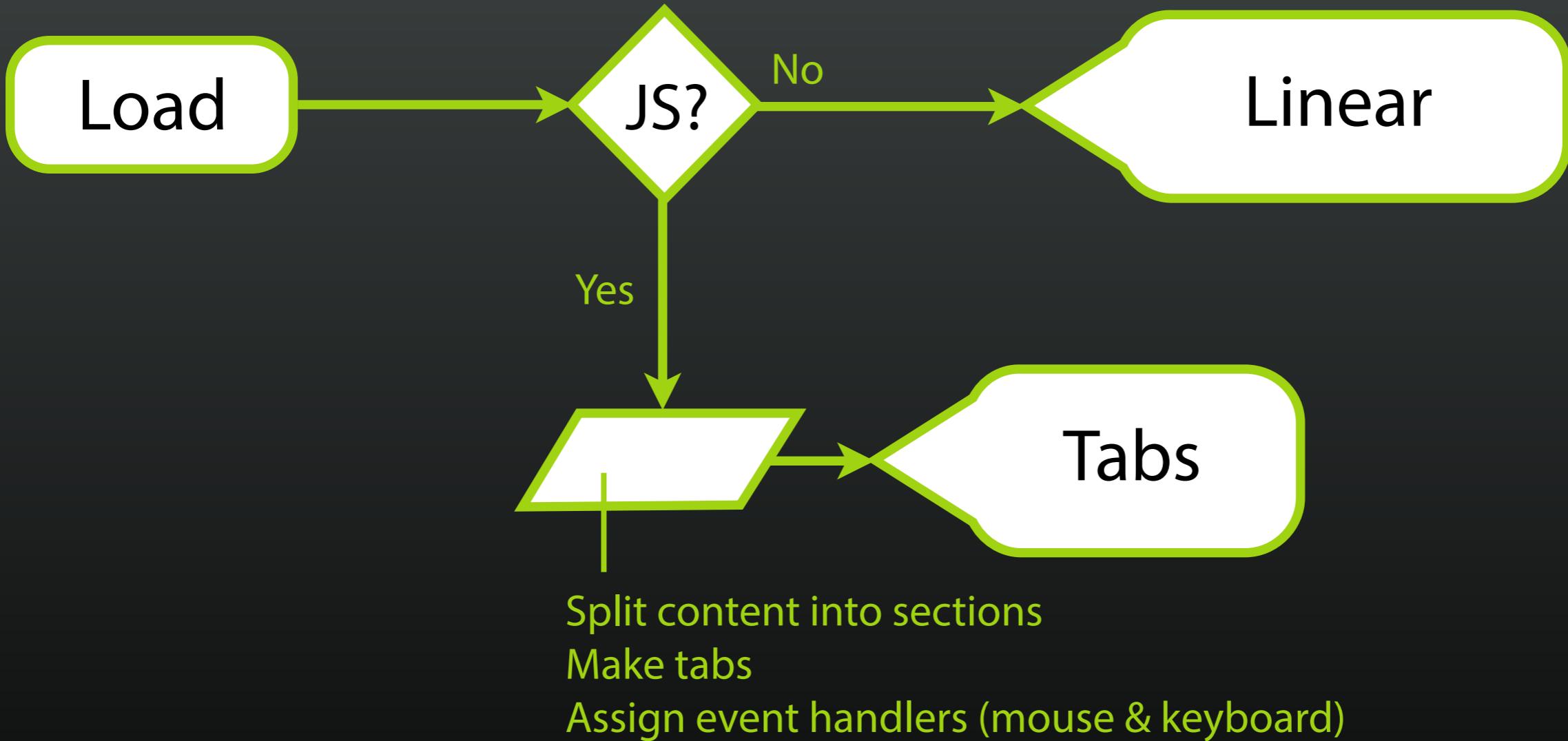
1. Preheat oven to 425°F
2. Combine sugar, salt, cinnamon, ginger and cloves in small bowl.
3. Beat eggs lightly in large bowl.
4. Stir in pumpkin and sugar-spice mixture.
5. Gradually stir in evaporated milk.
6. Pour into pie shell.
7. Bake for 15 minutes.
8. Reduce temperature to 350°F; bake for 40 to 50 minutes or until knife inserted near center comes out clean.
9. Cool on wire rack for 2 hours.
10. Serve immediately or refrigerate.

NUTRITION

Servings Per Recipe: 8

Amount Per Serving

IxMap



IxMap

Load

Pumpkin Pie

OVERVIEW

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ear

Linear HTML

```
<h1>Pumpkin Pie</h1>
<div class="tabbed-interface">
  <h2>Overview</h2>
  
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      dish pie crust</li>
    <li> $\frac{1}{2}$  cup white sugar</li>
    <!-- ... -->
  </ul>
  <h2>Directions</h2>
  <!-- ... -->
</div>
```

Tabbed

```
<h1>Pumpkin Pie</h1>
<div class="tabbed-interface TabInterface-enabled">
  <ul class="tabs">
    <li><a href="#folder-1">Overview</a></li>
    <li><a href="#folder-2">Ingredients</a></li>
    <li><a href="#folder-3">Directions</a></li>
    <li><a href="#folder-4">Nutrition</a></li>
  </ul>
  <section id="folder-1">
    <h2>Overview</h2>
    
    <p>Whether you're hosting a festive party or a casual get-together with friends, our Pumpkin Pie will make entertaining easy!</p>
    <!-- ... -->
  </section>
  <!-- ... -->
</div>
```

Tabbed

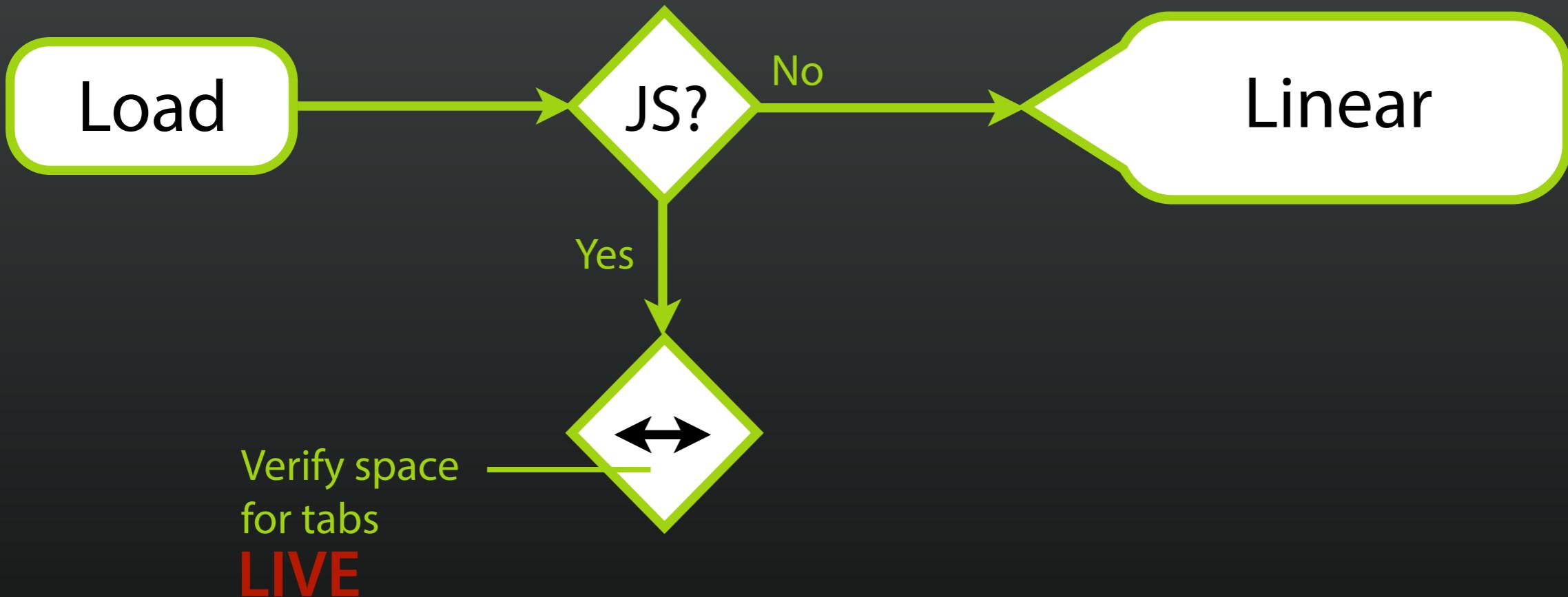
```
<h1>Pumpkin Pie</h1>
<div class="tabbed-interface TabInterface-enabled">
  <ul class="tabs">
    <li><a href="#folder-1">Overview</a></li>
    <li><a href="#folder-2">Ingredients</a></li>
    <li><a href="#folder-3">Directions</a></li>
    <li><a href="#folder-4">Nutrition</a></li>
  </ul>
  <section id="folder-1">
    <h2>Overview</h2>
    
    <p>Whether you're hosting a festive party or a casual get-together with friends, our Pumpkin Pie will make entertaining easy!</p>
    <!-- ... -->
  </section>
  <!-- ... -->
</div>
```



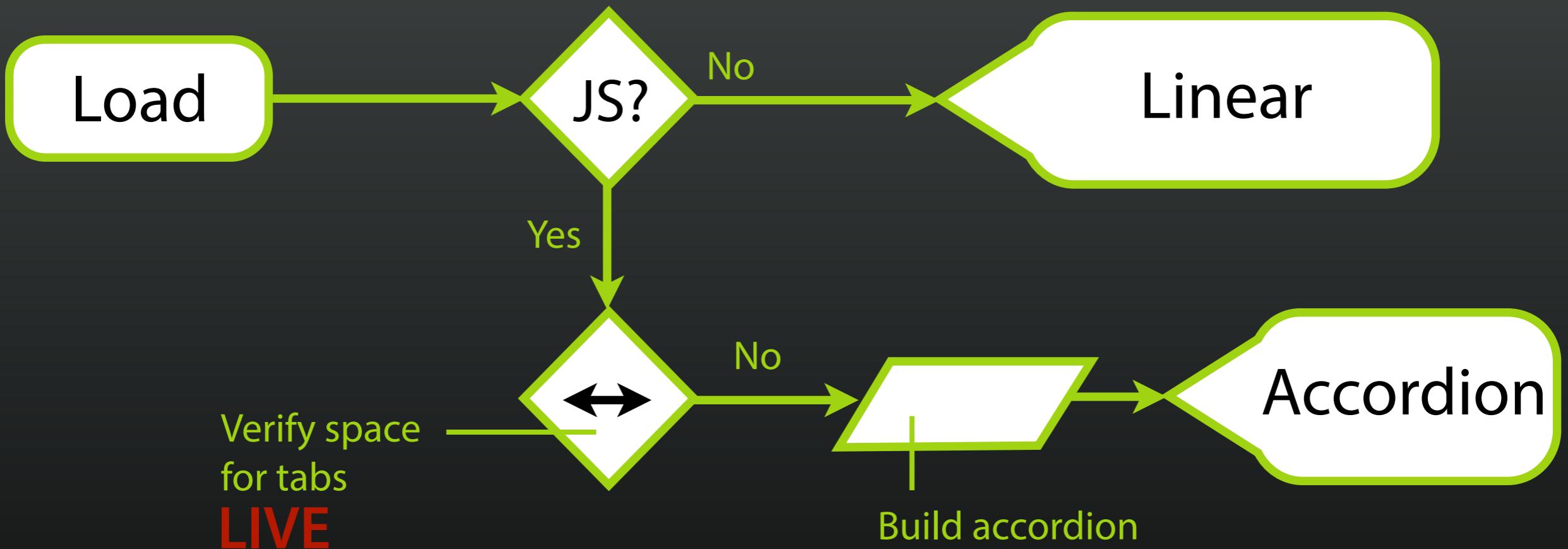
IxMap



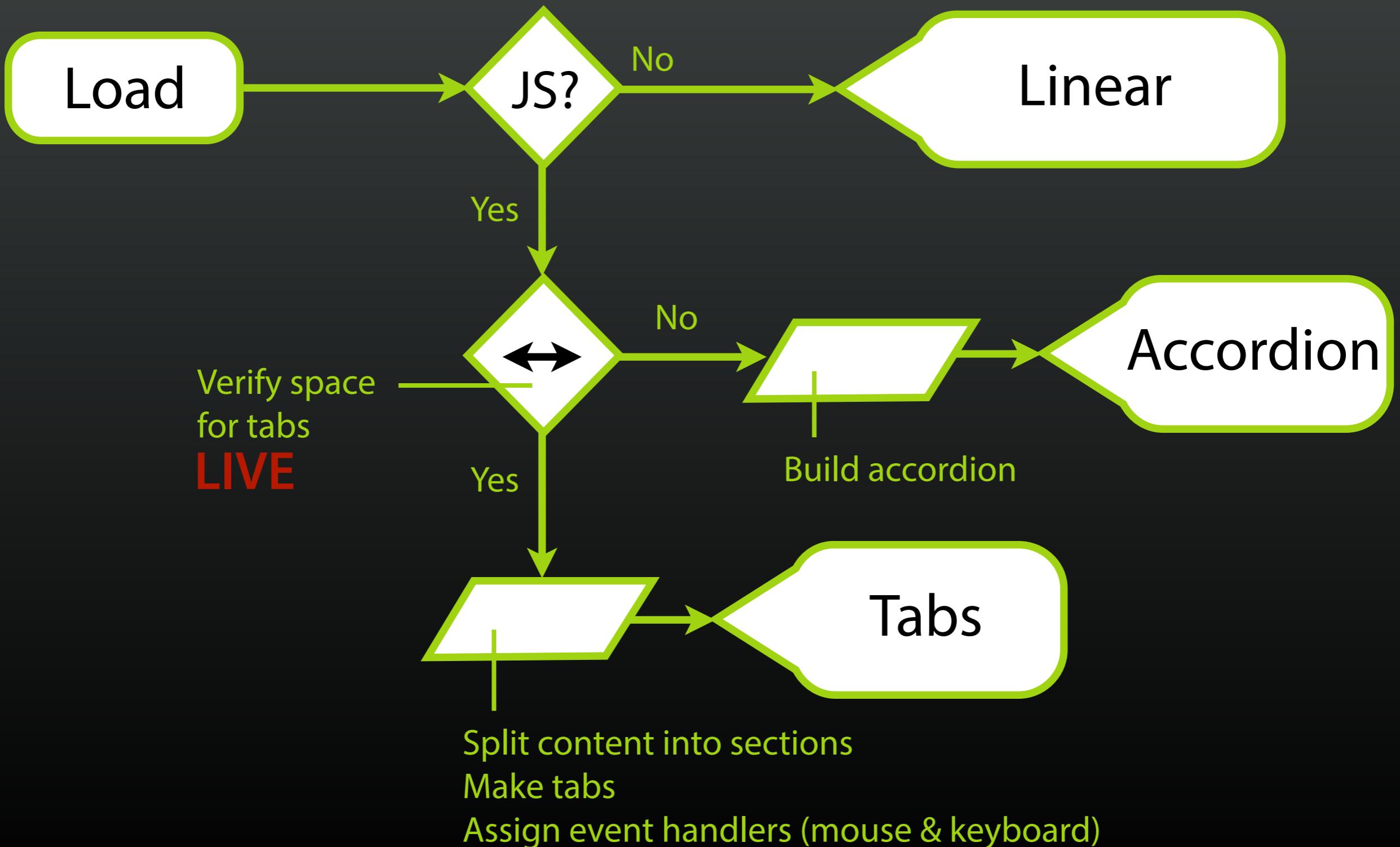
IxMap



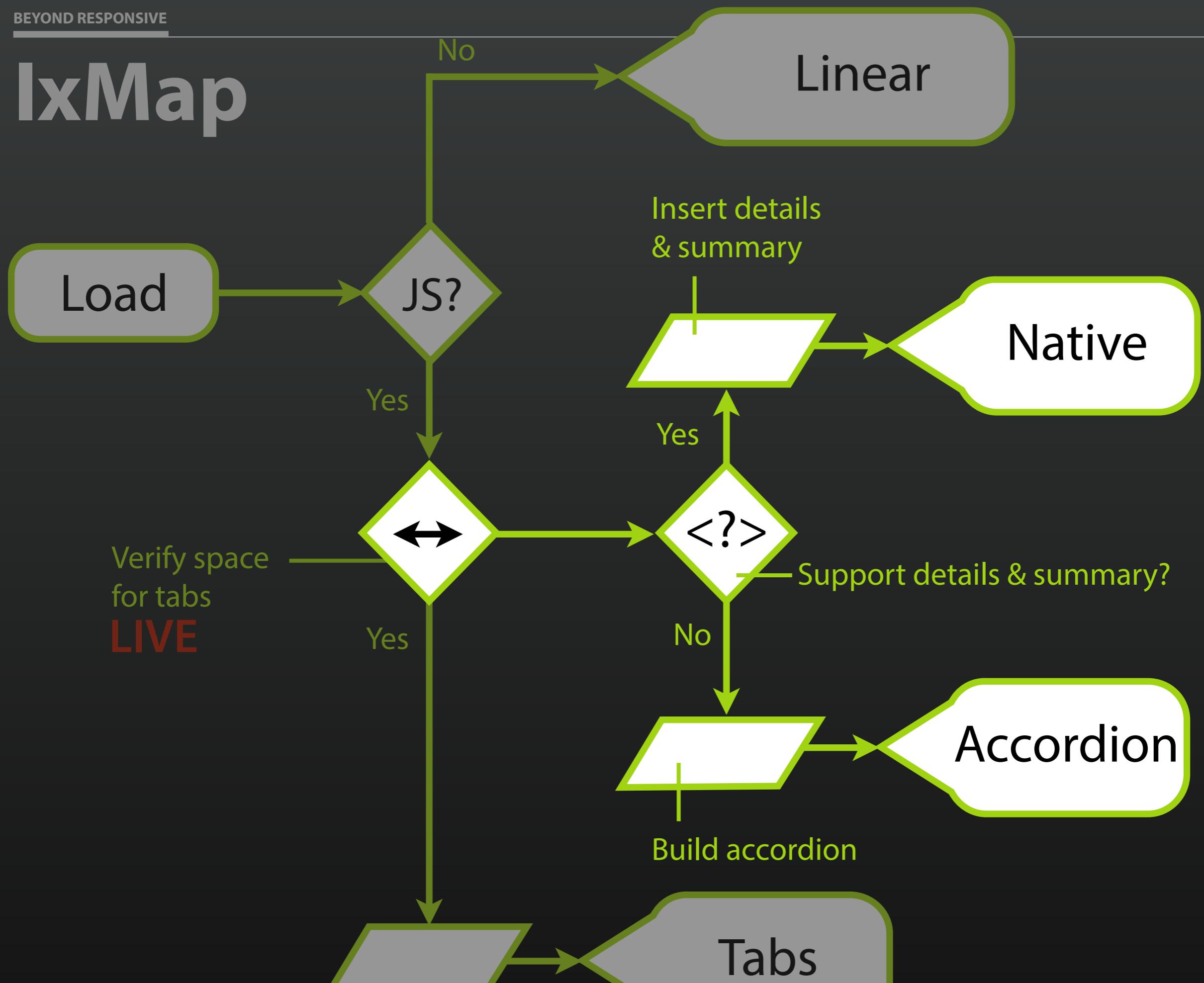
IxMap



IxMap



IxMap



Adding ARIA

role="tablist"

Pumpkin Pie

OVERVIEW INGREDIENTS DIRECTIONS NUTRITION

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Adding ARIA

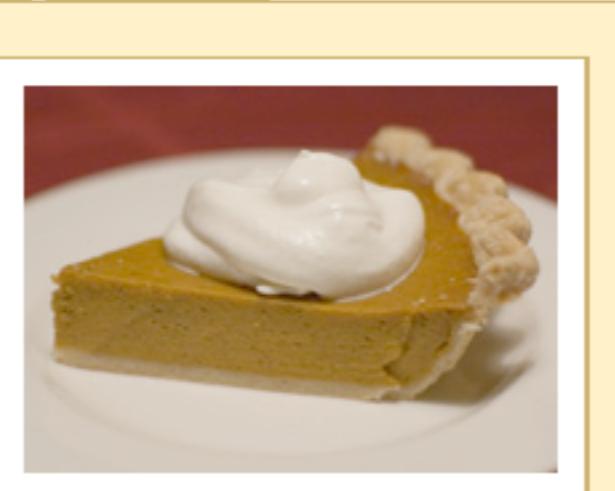
Pumpkin Pie

OVERVIEW **INGREDIENTS** **DIRECTIONS** **NUTRITION**

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role="tab"
aria-selected="true"
aria-controls="folder-1"

Adding ARIA

role="tab"
aria-selected="false"
aria-controls="folder-4"

Pumpkin Pie

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Adding ARIA

Pumpkin Pie

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role="tabpanel"
aria-hidden="false"
aria-labelledby="folder-1-tab"

Result!

Pumpkin Pie

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Pumpkin pie Mozilla Firefox

Photo by [Paul Covette](#), licensed under [Creative Commons](#).

Result!

Pumpkin Pie

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Photo by [Paul Covette](#), licensed under [Creative Commons](#).

Tabbed Interface

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Questions?

Tweet me at
@AaronGustafson

Thank you!

@AaronGustafson

aaron-gustafson.com

slideshare.net/AaronGustafson

