

I'M NOT BUILDING A SPA WITH *

ES6 WEB COMPONENTS

*BUT YOU CAN IF YOU'RE INTO THAT SORTA THING



ME.
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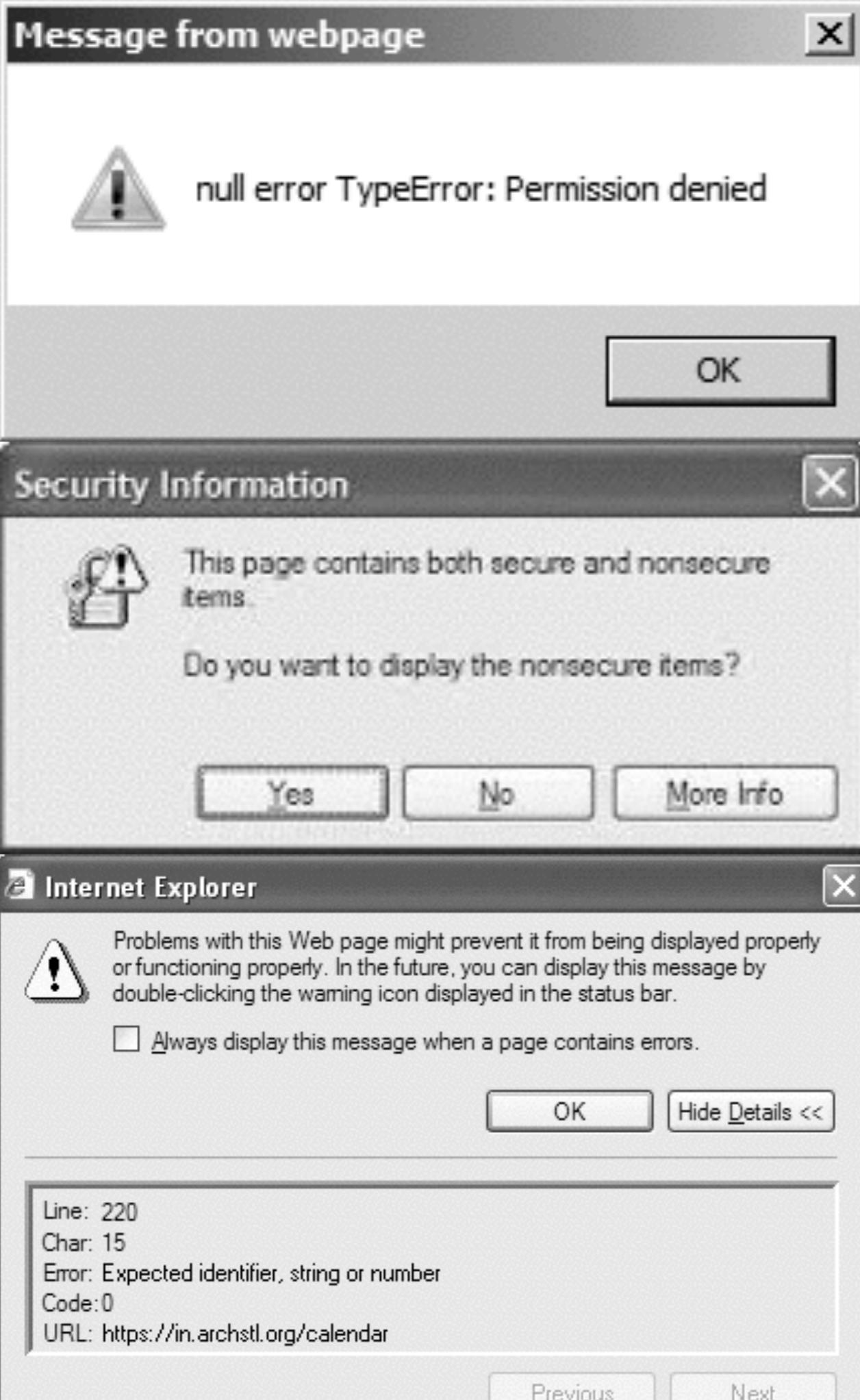


I DON'T HAVE TO WORRY ABOUT
PRODUCTION CODE ANYMORE

SR. EXPERIENCE DEV @ ADOBE INCUBATION & PROTOTYPING



**WHATS THE QUICKEST WAY TO BUILD?
(WHILE PLANNING TO AVOID COLLAPSE)**



IN THE MID-2000'S

Collapse probably meant failing multiple ways across multiple browsers

jQuery 1.4 API Cheat Sheet

ectors

Hierarchy
ancestor
descendant
parent > child
prev + next
prev ~ siblings

Content Filters
:contains(text)
:empty
:has(selector)
:parent

Visibility Filters
:hidden
:visible

Attribute Filters
[attribute]
[attribute=value]
[attribute!=value]
[attribute^=value]
[attribute\$=value]
[attribute*=value]
[attribute]=value

Core

jQuery function
\$.jQuery(selector [, context])
\$.jQuery(element), \$.jQuery(elementArray)
\$.jQuery(jQueryObject), \$.jQuery() 1.4+
\$.jQuery(html [, ownerDocument]), \$.jQuery(html, props) 1.4+
\$.jQuery(fn)

jQuery Object Accessors
\$.each(index, element)
num .size(), .length
str .selector
el .context
\$.eq(index)
[el].el .get(index)
num .index() 1.4+, .index(selector) 1.4+, .index(element)
arr .toArray() 1.4+

Interoperability
\$.jQuery.noConflict(extreme)

Attributes

Attributes
str .attr(name)
\$.attr(name, val), .attr(map), .attr(name, fn(index, attr))
\$.removeAttr(name)

Class

Traversing

Filtering
\$.eq(index)
\$.first() 1.4+
\$.last() 1.4+
\$.has(selector), \$.has(element) 1.4+
\$.filter(selector), \$.filter(fn(index))
bool .is(selector)
\$.map(index, element)
.not(selector), .not(elements), .not(index)
\$.slice(start, end)

Tree traversal
\$.children(selector)
\$.closest(selector, context) 1.4+
arr .closest(selectors, context) 1.4+
\$.find(selector)
\$.next(selector)
\$.nextAll(selector)
\$.nextUntil(selector) 1.4+
\$.offsetParent()
\$.parent(selector)
\$.parents(selector)
\$.parentsUntil(selector) 1.4+
\$.prev(selector)
\$.prevAll(selector)
\$.prevUntil(selector) 1.4+

Events

Page Load
\$.ready(fn)

Event Handling
\$.bind(type [, data], fn(eventObj))
\$.one(type [, data], fn(eventObj))
\$.trigger(event [, data])
obj .triggerHandler(event [, data])
\$.unbind([type] [, fn])

Live Events
\$.live(eventType [, data], fn)
\$.die(eventType [, fn])

Interaction Helpers
\$.hover(fnIn(eventObj), fnOut(eventObj))
\$.toggle(fn(eventObj), fn2(eventObj) [, ...])

Event Helpers
\$.blur(fn), .mousedown(fn),
\$.change(fn), .mouseenter(fn),
\$.click(fn), .mouseleave(fn),
\$.dblclick(fn), .mousemove(fn),
\$.error(fn), .mouseout(fn),
\$.focus(fn), .mouseover(fn),
\$.focusin(fn), 1.4+, .mouseup(fn),
\$.focusout(fn), 1.4+, .resize(fn),
\$.keydown(fn), .scroll(fn),
\$.keypress(fn), .select(fn),
\$.prev(fn), .keyup(fn), .submit(fn),
\$.prevUntil(selector) 1.4+

AJAX

Low-Level Interface
XHR \$.ajax(options)
bool async = true
bool cache = true
str contentType
obj str data
bool global = true
str jsonp
str password
num timeout
str url = curr. page
fn xhr
str dataType ∈ {xml, json, script, html}
fn error(XHR, status, errorThrown)
fn success(data, status, XHR)

jQuery.ajaxSetup(options)

Shorthand Methods
\$.load(url [, data] [, fn(responseText, status, XHR)])
XHR \$.jQuery.get(url [, data] [, fn(data, status, XHR)] [, type])
XHR \$.jQuery.getJSON(url [, data] [, fn(data, status)])
XHR \$.jQuery.getScript(url [, fn(data, status)])
XHR \$.jQuery.post(url [, data] [, fn(data, status)] [, type])

Global Ajax Event Handlers
\$.ajaxComplete(fn(event, XHR, options))
\$.ajaxError(fn(event, XHR, options, thrownError))
\$.ajaxSend(fn(event, XHR, options))
\$.ajaxStart(fn())
\$.ajaxStop(fn())

ENTER JQUERY

\$.html(val), \$.html(fn(index, html)) 1.4+
str .text()
\$.text(val), .text(fn(index, html)) 1.4+

Value
str, arr .val()
\$.val(val), .val(fn) 1.4+

CSS

CSS
str .css(name)
\$.css(name, val), .css(map),

Inserting Inside
\$.append(content), \$.append(fn(index, html)) 1.4+
\$.appendTo(target)
\$.prepend(content), \$.prepend(fn(index, html)) 1.4+
\$.prependTo(target)

Inserting Outside
\$.after(content), .after(fn) 1.4+
\$.before(content), .before(fn) 1.4+

el preventDefault(), relatedTarget,
obj result, stopImmediatePropagation(),
stopPropagation()
el target, num timeStamp,
str type, str which
}

Effects

Basic

obj \$.jQuery.browser deprecated
str \$.jQuery.browser.version deprecated
bool \$.jQuery.boxModel deprecated

Basic operations
obj \$.jQuery.each(obj, fn(index, valueOfElement))
obj \$.jQuery.extend([deep] target, obj1 [, objN])
arr \$.jQuery.grep(array, fn(element, index) [, invert])
arr \$.jQuery.makeArray(obj)
arr \$.jQuery.map(array, fn(element, index))
num \$.jQuery.inArray(val, array)
arr \$.jQuery.merge(first, second)

SUPER HELPFUL TO NORMALIZE BROWSER BEHAVIOR

Height and Width
int .height()
\$.height(val)
int .width()
\$.width(val)
int .innerHeight()
int .innerWidth()
int .outerHeight([margin])
int .outerWidth([margin])

Replacing
\$.replaceWith(content), \$.replaceWith(fn) 1.4+
\$.replaceAll(selector)

Removing
\$.detach(selector) 1.4+
\$.empty()
\$.remove(selector)

Copying
\$.clone([withDataAndEvents])

Fade Out
\$.fadeOut(duration [, fn])
\$.fadeTo(duration, opacity [, fn])

Custom
\$.animate(params [, duration [, easing]] [, fn])
\$.animate(params, options)
\$.stop([clearQueue] [, jumpToEnd])
\$.delay(duration [, queueName]) 1.4+

Settings
bool \$.jQuery.fx.off

fn .removeData(name)
[fn] .queue(name) \$.jQuery.queue(name)
\$.queue(name, fn(next)), \$.jQuery.queue([name], fn)
\$.queue(name, queue), \$.jQuery.queue([name], queue)

Test operations
bool \$.jQuery.isArray(obj)
bool \$.jQuery.isEmptyObject(obj) 1.4+
bool \$.jQueryisFunction(obj)
bool \$.jQuery.isPlainObject(obj) 1.4+

```
html>
g="en">
<title>iOS/Android Canvas</title>
  rel="stylesheet" href="http://code.jquery.com/mobile/1.0a4.1/
  pt type="text/javascript" src="http://code.jquery.com/jquery-1
  pt type="text/javascript" src="http://code.jquery.com/mobile/1
<script>
$(function() {
  var canvasContext;
  resizeCanvas();
  $(window).resize(function() { resizeCanvas() });

  function resizeCanvas()
  {
    var w = window.innerWidth / 1.2;
    var h = window.innerHeight / 1.2;
    var canvasString = '<canvas id="mainCanvas" width="

    $('#contentholder').empty();
    $(canvasString).appendTo('#contentholder');
    canvasContext = $('#mainCanvas').get(0).getContext('

    $('#mainCanvas').bind('tap', function(event) {
      touchX = event.pageX;
      touchY = event.pageY;
      canvasContext.fillStyle="#0f0";
      canvasContext.fillRect(touchX, touchY, 10, 10);

      canvasContext.font = "20pt Arial";
      canvasContext.fillText("X: " + touchX + ", Y: " + touchY, 10, 10);
    });
  }
});
```

SITES GOT MORE COMPLICATED



WTF IS EVEN GOING ON HERE
ANYMORE?

jQuery didn't really help or
hurt organization or code
readability

I'M BUILDING A SPA WITH *

SOME SORT OF WEB
FRAMEWORK

* GOD HELP YOU IF YOU TRY TO BUILD ANYTHING ELSE



THEE MUST USE REACT
BECAUSE FACEBOOK

AREN'T THOU USING
ANGULAR?
ITS GOOGLE MADE

MEOW,
EMBER

ITS NOT A FRAMEWORK ITS A RELIGION

Angular says:

```
<my-directive  
  my-param="someparam">  
</my-directive>  
  
.directive('myDirective', function() {  
  return {  
    template: 'Name: {{customer.name}}  
              Address: {{customer.address}}'  
  };  
});
```

React says:

```
var CommentBox = React.createClass({  
  render: function() {  
    return (  
      <div className="commentBox">  
        Hello, world! I am a CommentBox.  
      </div>  
    );  
  }  
});  
ReactDOM.render(<CommentBox />,  
  document.getElementById('content')  
);
```

LET THERE BE
LIGHT MODULAR
PATTERNS. . . .

Ember says:

```
App.ConfirmButtonComponent =  
  Ember.Component.extend({  
    actions: {  
      showConfirmation: function() {  
        ...  
      },  
  
      confirm: function() {  
        ...  
      }  
    }  
  });  
  
{{#if isShowingConfirmation}}  
  <button {{action "confirm"}}>  
    Click again to confirm  
  </button>  
{{else}}  
  <button {{action "showConfirmation"}}>  
    {{title}}  
  </button>  
{{/if}}
```

LET THERE BE
LIGHT MODULAR
PATTERNS....

Dojo says:

```
require([
  "dojo/_base/declare", "dojo/parser",
  "dojo/ready", "dijit/_WidgetBase",
], function(declare,
  parser,
  ready,
  _WidgetBase){

  declare("MyFirstWidget",
    [_WidgetBase], {
      // put methods, attributes, etc. here
    });
  ready(function(){
    parser.parse();
  });
});

<span
  data-dojo-type="MyFirstWidget">
  hi
</span>
```

LET THERE BE
LIGHT MODULAR
PATTERNS. . . .



RELIGIOUS FRAMEWORKS MAKE IT HARD TO GET ALONG

CUSTOM TAGS

STUPID HTML5 PARLOUR
TRICKS

TextMate File Edit View Text Navigation Bundles Window Help (Charged) Sat 1:38 PM Adrian Pomilio

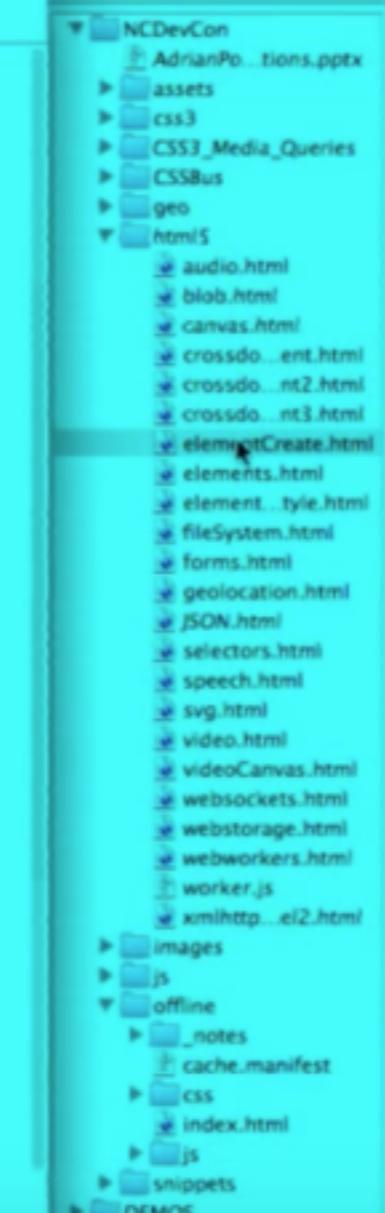
elementCreate.html — ncdevcon-html5

```
<!DOCTYPE HTML>
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
<title>Create an Element</title>
<script>
// just admit the truth
document.createElement("iesucks");

</script>
<style>
/* explain how the truth should look */
iesucks {display:block; background-color:#060; width:300px; margin:
auto; padding:10px;}
iesucks h1{text-align:center; color:white; letter-spacing:1.5px}

p{text-align:center; color:white;}
</style>
</head>

<body>
  <h1>Create an Element</h1>
<iesucks>
  <h1>&lt; iesucks &gt;</h1>
<p>Agreed upon by many, but still used by more. Doh!</p>
```



NCDEVCONCEPTION CIRCA 2011 WITH ADRIAN POMILIO'S HTML5 DEEP DIVE

NOTE: IN 2011 IT WAS DOCUMENT.CREATEELEMENT...
NOW, IT'S DOCUMENT.REGISTERELEMENT



App

App
Elements

App elements

Fe

Iron
Elements

Polymer core elements

Md

0.10.0

1.0.10

1.0.7

TURNS OUT,
CREATING
CUSTOM
ELEMENTS ISN'T
DUMB.

POLYMER IS ACTUALLY PRETTY NIFTY



Polymer says:

```
MyElement = Polymer({  
  is: 'my-element',  
  
  created: function() { ... },  
  
  ready: function() { ... },  
  
  attached: function() { ... },  
  
  detached: function() { ... },  
  
  attributeChanged:  
    function(name, type) {  
      ...  
    }  
});
```

BUT WE'RE BACK
HERE AGAIN
USING LIBRARY
SPECIFIC CODE

...
...



POLYMER ISN'T QUITE SO
OPPRESSIVE

YEAH, BUT I STILL WISH I
DIDN'T HAVE TO LEARN AN
ECOSYSTEM

MEOW,
X-TAGS?

HARMONY HAPPENS BETWEEN RELIGIONS WHEN THERE IS LESS LEARNING CURVE

MEANWHILE...

GOOGLE AND MOZILLA SPUN THE POLYFILL
FOR POLYMER OFF INTO WEBCOMPONENTS.JS



AND I SAID...



**OMG. I CAN JUST MAKE MY OWN WEB
COMPONENTS!
(FRAMEWORKS & LIBRARIES COMPLETELY OPTIONAL)**

DISMANTLING THE BUZZ WORD

WEB COMPONENTS

But only because it was a simple term that represented a lot of features:

canvas tag

media tag

content editable

web workers

local storage

lots more

REMEMBER
HTML5?

THAT WAS A
BUZZWORD.

Custom Elements
HTML Imports
The Shadow DOM

WEB
COMPONENTS
ARE THE SAME

(BUT NOT AS OVERWHELMING)

```
document.registerElement(  
  'bens-button',  
  'HTMLElement');
```

// Acts like a DIV

```
document.registerElement(  
  'bens-button',  
  'HTMLButtonElement');
```

// Acts like a real button

CUSTOM ELEMENTS

```
<bens-button>  
</bens-button>
```

```
document.registerElement(  
  'bensbutton');  
  
// is an HTMLUnknownElement  
  
document.registerElement(  
  'bens-button');  
  
// is correct
```

NAMESPACING YOUR CUSTOM ELEMENTS

```
<bensbutton>  
</bensbutton>
```

```
document.registerElement(  
  'bens-button', {  
    prototype: MyElementProto  
  });  
  
// we'll discuss  
// MyElementProto later
```

CUSTOM ELEMENT LOGIC

```
<bens-button>  
</bens-button>
```

YOU CAN JUST USE CUSTOM ELEMENTS AND MAKE A

MVWC (MINIMUM VIABLE WEB COMPONENT)

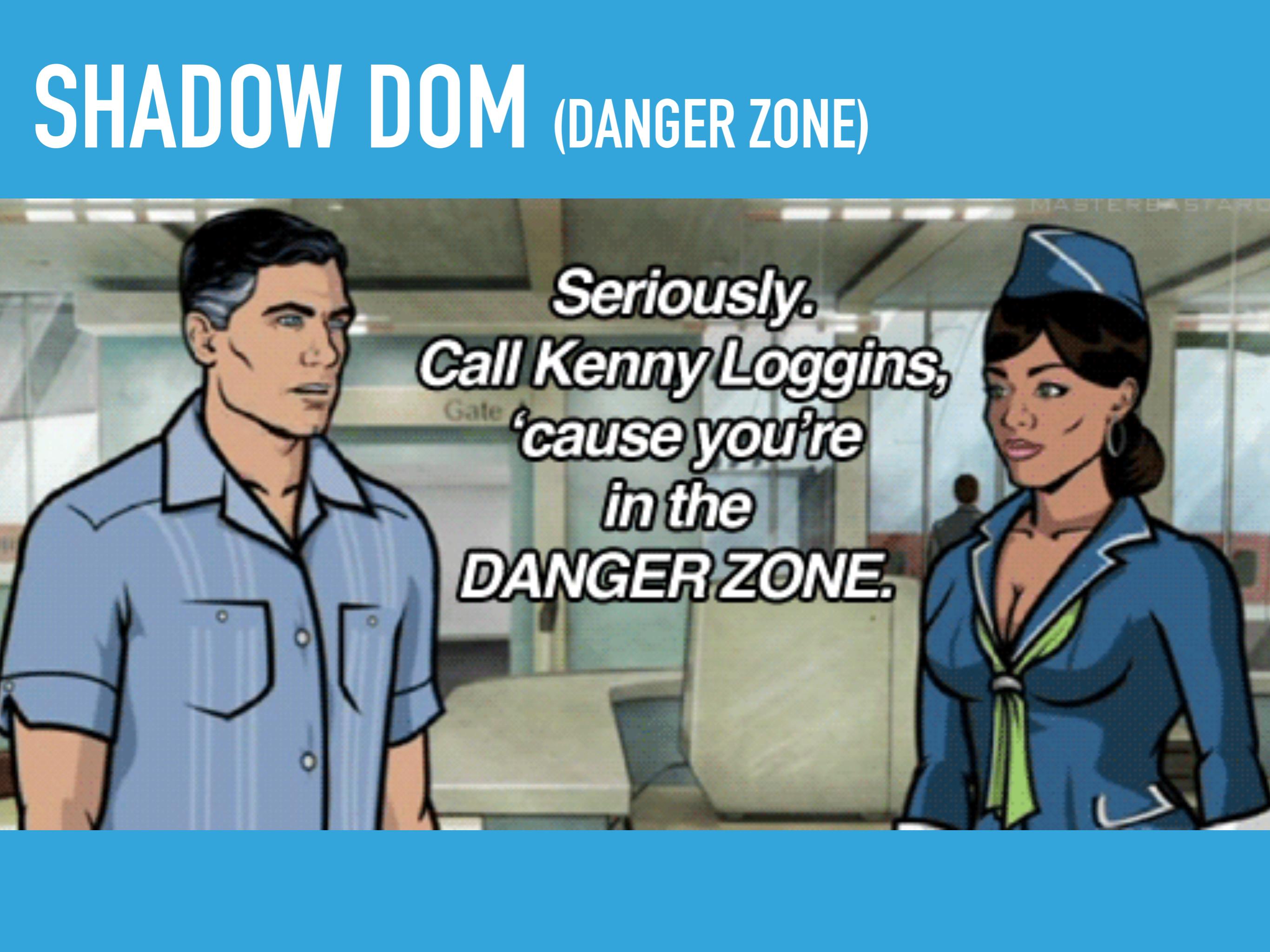
BUT THERE'S MORE!

HTML IMPORTS (OPTIONAL)

```
<link rel="import" href="mycomponent.html">
```

```
<script src="src/mycomponent.js"></script>
<template>
  ...some html here
</template>
```

SHADOW DOM (DANGER ZONE)



Seriously.
Call Kenny Loggins,
'cause you're
in the
DANGER ZONE.

Custom Elements

HTML Imports

The Shadow DOM

Classes

Fat Arrows

Imports

WEB COMPONENTS

ES6/ES2015

COMPONENT CLASSES IN ES6

```
class MyCustomComponent extends HTMLElement {  
    // Component logic goes here  
}
```

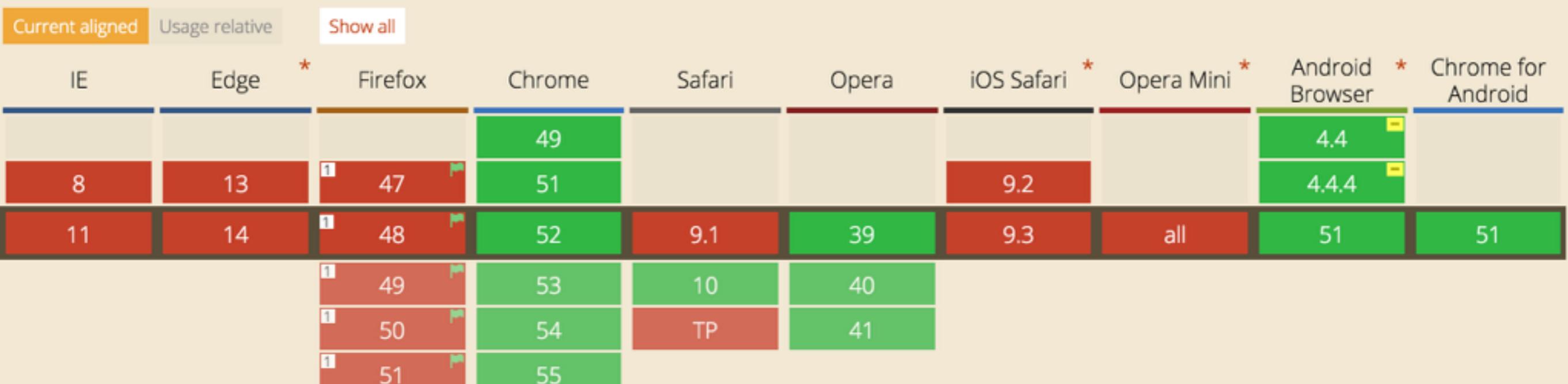
COMPONENT CLASSES IN ES6

THE API

```
class MyCustomComponent extends HTMLElement {  
  
  // Fires when an attribute was added, removed, or updated.  
  attributeChangedCallback(attr, oldVal, newVal) {};  
  
  // Fires when an instance of the element is created.  
  createdCallback() {}  
  
  // Fires when an instance was inserted into the document.  
  attachedCallback() {}  
}
```

THE DANGER ZONE

SHADOW DOM



similar support to HTML Imports
and Custom Elements... BUT

WITH THE WEB COMPONENTS POLYFILL,
YOU JUST CAN'T

HAVIDOL®
(avafynetyme HCI)
20mg tablets and suppositories

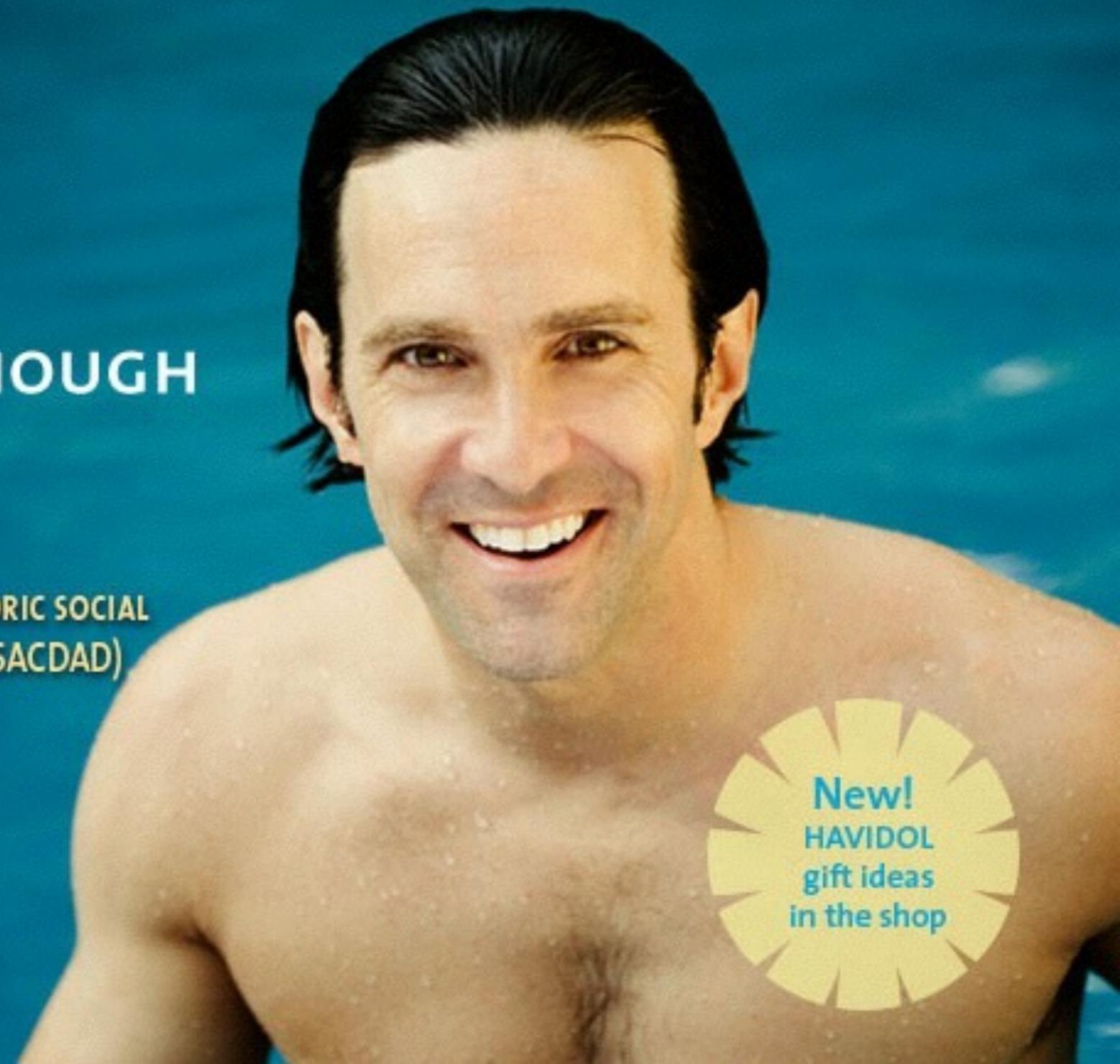
WHEN MORE IS NOT ENOUGH

HAVIDOL IS THE FIRST AND ONLY TREATMENT FOR DYSPHORIC SOCIAL
ATTENTION CONSUMPTION DEFICIT ANXIETY DISORDER (DSACDAD)

Use the ZING SELF ASSESSMENT TOOL

 Take the Quiz

New!
HAVIDOL
gift ideas
in the shop



SHADOW DOM POLYFILL SIDE EFFECTS MAY INCLUDE

- ▶ CSS encapsulation is limited.
- ▶ `Object.prototype.toString` does not return the same string as for native objects.
- ▶ No live `NodeLists`. All node lists are snapshotted upon read.
- ▶ `document`, `window`, `document.body`, `document.head` and others are non configurable and cannot be overridden. We are trying to make these work as seamlessly as possible but there will doubtlessly be cases where there will be problems; for those cases you can use `wrap` and `unwrap` to get unblocked.
- ▶ Cross window/frame access is not implemented.
- ▶ CSS `:host()` rules can only have (at most) 1-level of nested parentheses in its argument selector. For example, `:host(.zot)` and `:host(.zot:not(.bar))` both work, but `:host(.zot:not(.bar:nth-child(2)))` does not.

BUT WHEN THE BROWSER SUPPORTS SHADOW DOM NATIVELY



CSS DOESN'T LEAK IN AND YOUR DOM IS PROTECTED

USE/DON'T USE THE SHADOW DOM

```
createdCallback() {  
  var template = this.owner.querySelector('template');  
  var clone = template.content.cloneNode(true);  
  this.root = this.createShadowRoot(); // USE IT  
  this.root.appendChild(clone);  
  this.registerElements();  
};  
  
createdCallback() {  
  var template = this.owner.querySelector('template');  
  var clone = template.content.cloneNode(true);  
  this.root = this; // DONT USE IT  
  this.root.appendChild(clone);  
  this.registerElements();  
};
```

USE/DON'T USE THE SHADOW DOM

```
/** use it */
:host {
  color: red;
}
```

```
/** don't use it */
my-component {
  color: red;
}
```

USE AND DON'T USE THE SHADOW DOM

```
if (shadowflag) {  
    this.root = this.createShadowRoot();  
} else {  
    this.root = this  
}  
  
my-component, :host {  
    color: red;  
}
```

POLYFILL

<!-- Shadow DOM: -->

```
<script src="webcomponents.min.js"></script>
```

<!-- no Shadow DOM: -->

```
<script src="webcomponents-lite.min.js"></script>
```

ORGANIZING YOUR APPLICATION WITH

WEB COMPONENTS

COMPONENTS ON A PAGE

```
<html>
<body>
  <my-navbar style="compact"></my-navbar>
  <my-buttonbar style="full"></my-buttonbar>
  <my-pagecontent content="myserver.com/content.json">
  </my-pagecontent>

<script>
  document.querySelector('mynavbar').addEventListener(
    'customevent', function() {
      // do something
    });
</script>
</body>
</html>
```

COMPONENTS IN COMPONENTS

```
<html>
<body>
  <my-app></my-app>
</body>
</html>
```

```
<my-app>
  <my-navbar style="compact"></my-navbar>
  <my-buttonbar style="full"></my-buttonbar>
  <my-pagecontent content="myserver.com/content.json">
    </my-pagecontent>
</my-app>
```

USE YOUR FAVORITE LIBS

PREFERABLY MICROLIBS

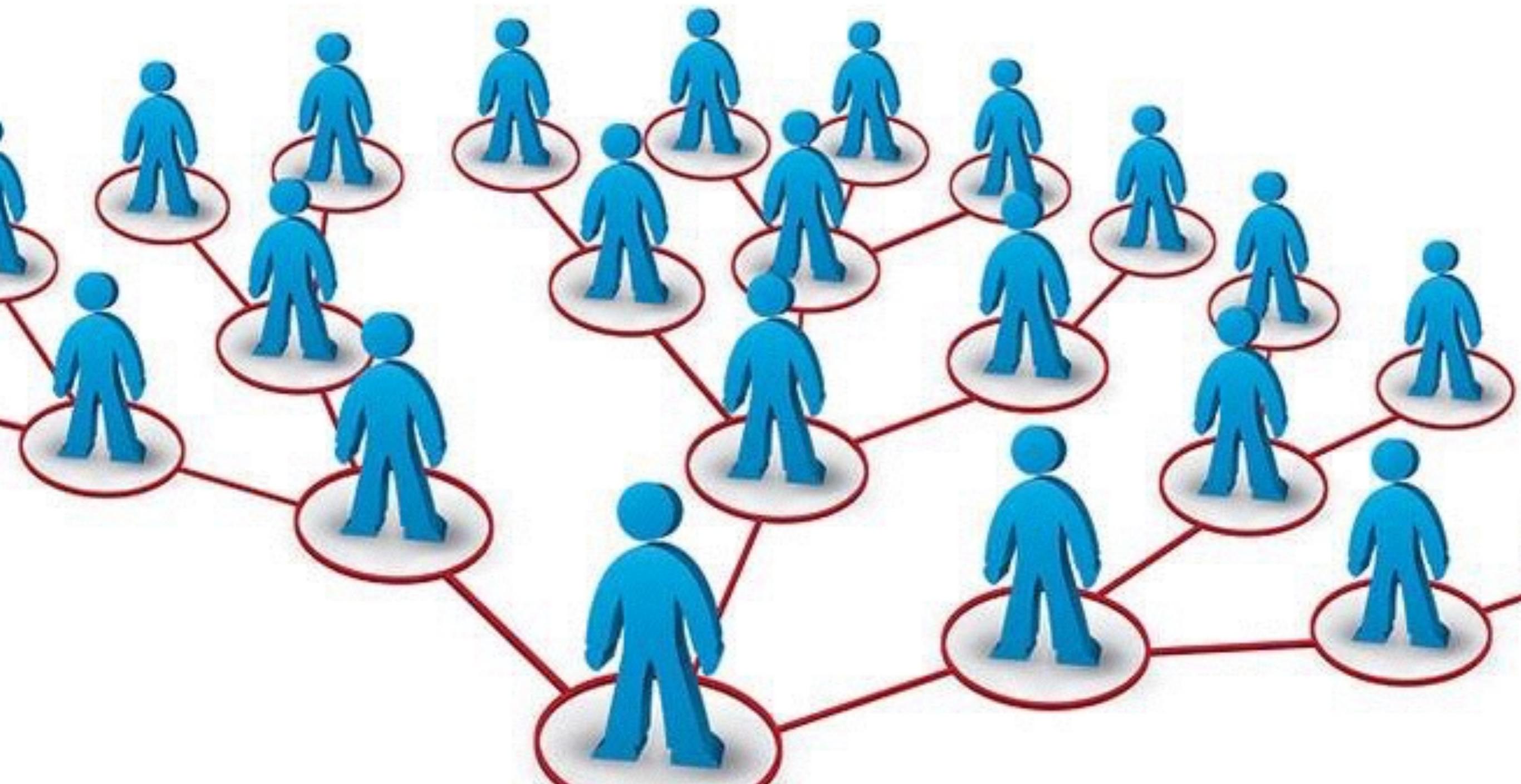
```
// if used in multiple components  
// it's already cached, so no server hit
```

```
<script src="moment.js"></script>
```

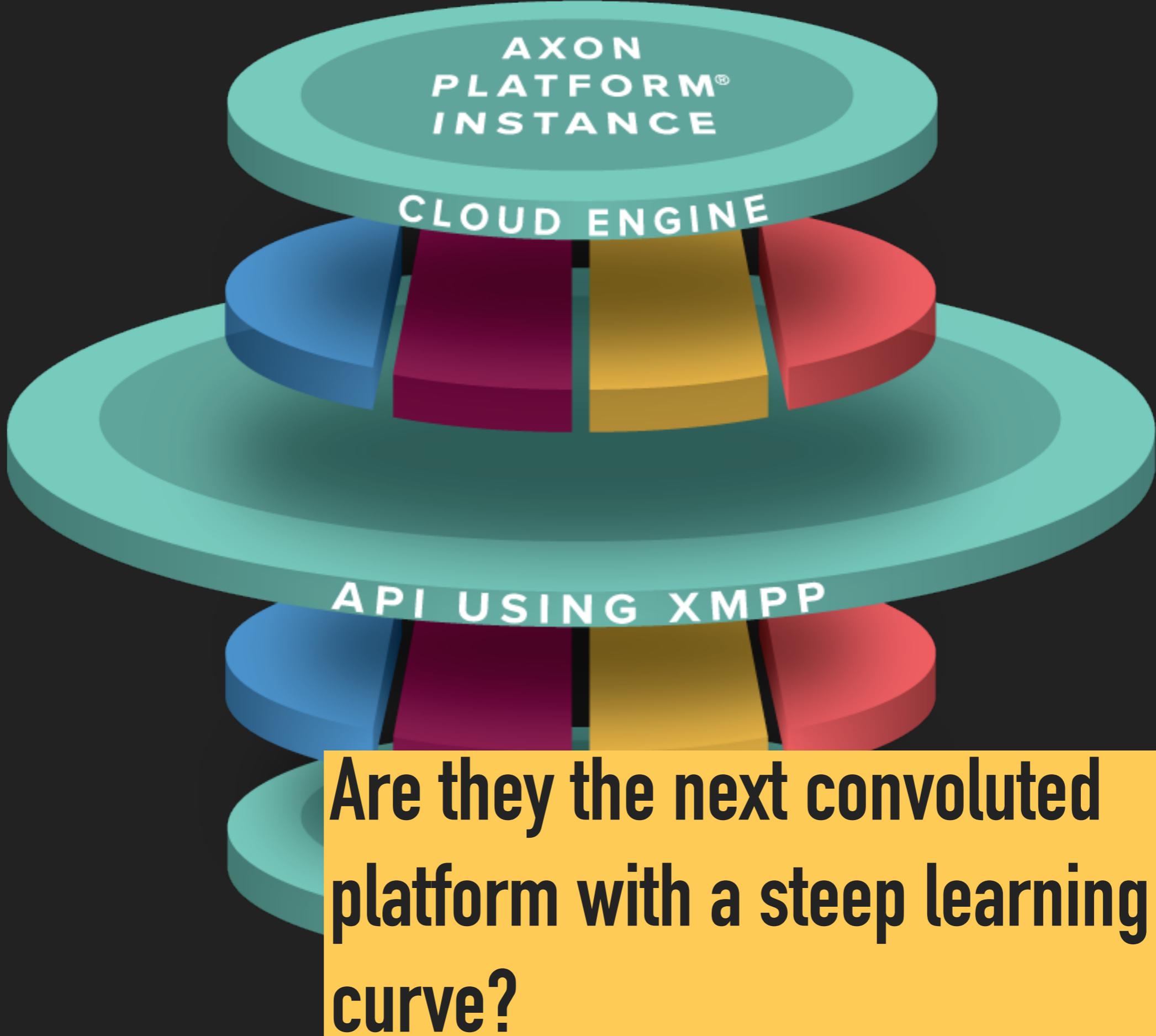
```
<script src="jquery.js"></script>
```

THE BIG TAKEAWAY FOR

WEB COMPONENTS



**Are Web Components the next
pyramid scheme?**



**is it some hipster library that's
all the rage today and gone
tomorrow?**

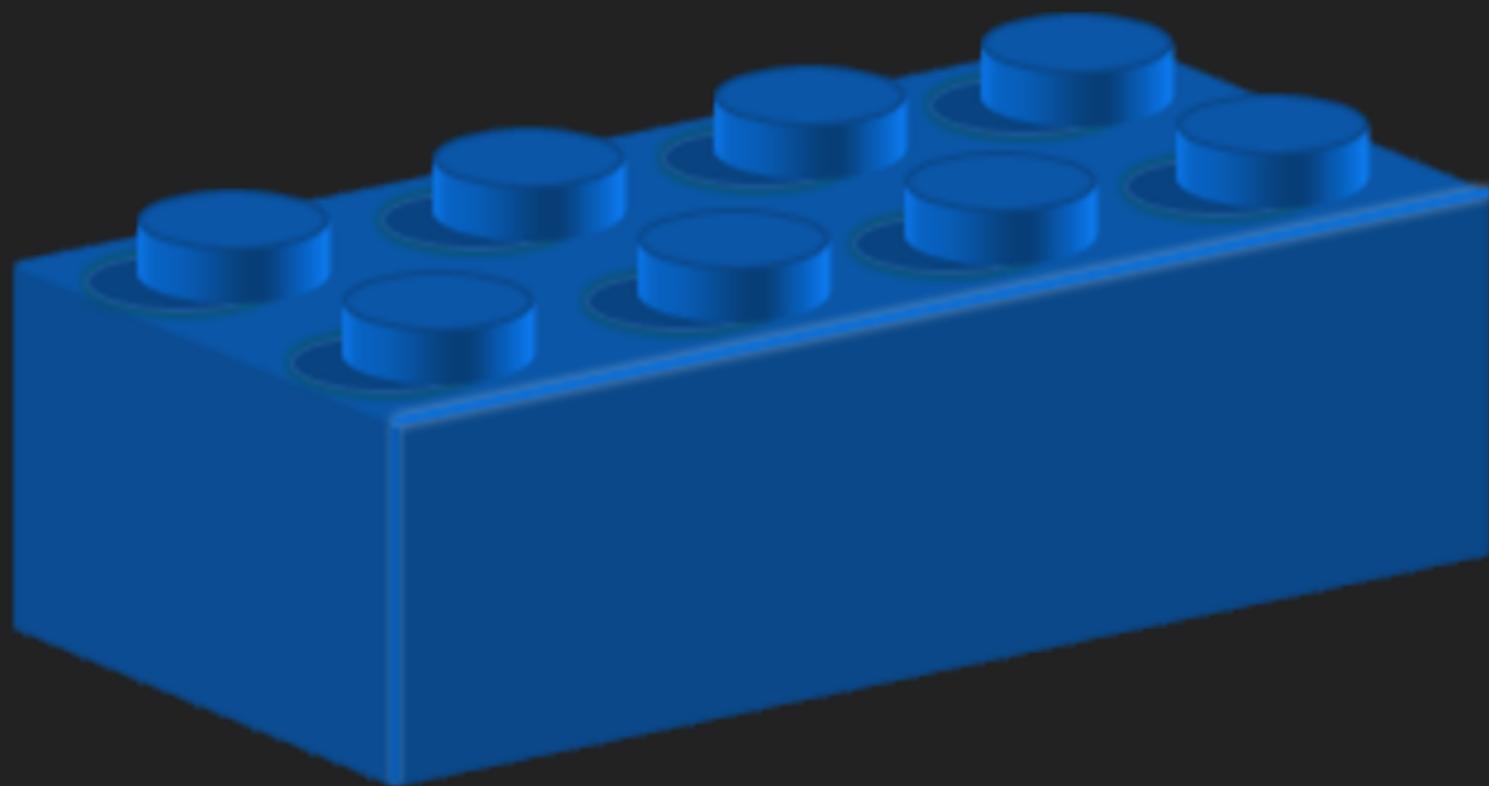


NOPE!

JUST A FEW EMERGING WEB STANDARDS TO MAKE LIFE EASIER

MIX HOWEVER YOU LIKE
BECAUSE NOT EVERY PROJECT IS THE SAME SPA

Components (web or not) have been around for ages.



this is not why components are great

A large pile of colorful LEGO bricks of various shapes, sizes, and colors, including red, blue, yellow, white, black, and grey, scattered across a surface.

THIS is.

I'VE BEEN USING WEB COMPONENTS FOR
ABOUT A YEAR

I DO HAVE OTHER INTERESTS THOUGH

I'VE BEEN USING WEB COMPONENTS
ABOUT A YEAR



I'M TAKING WEB COMPONENTS WITH ME

A-FRAME

Examples

Hello World

Anime UI

Composite

360° Video

Curved Mockups

Spheres & Fog

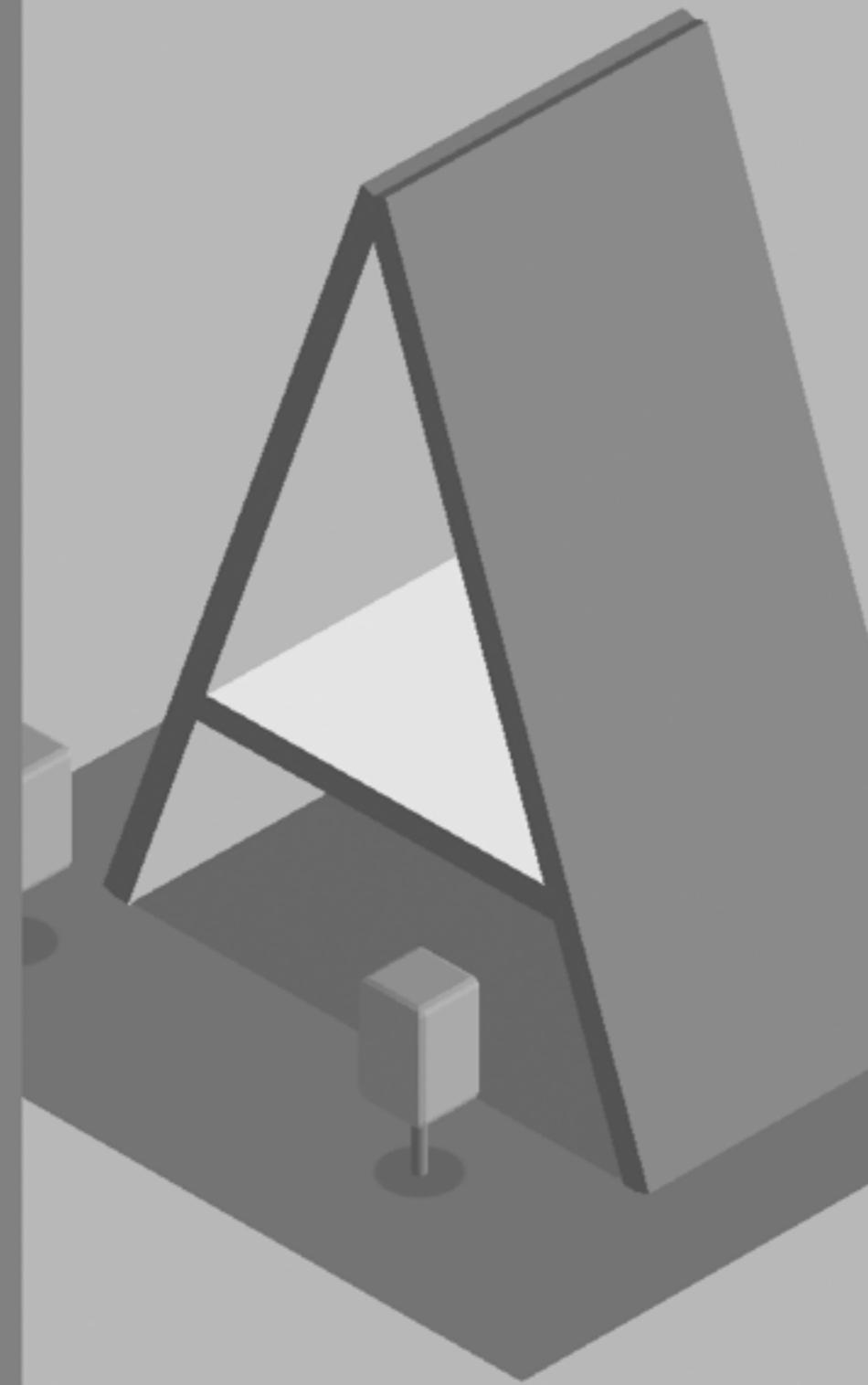
Shopping

Warp

Logo

Unfold

Panorama



MOZILLA IS TOO

**Mozilla's A-Frame is
markup for WebVR**

```
<html>

<head>
  <script src="aframe.min.js"></script>
</head>

<body>
  <a-scene>
    <a-box color="#6173F4" opacity="0.8" depth="2"></a-box>
    <a-sphere radius="2" src="texture.png"
      position="1 1 0"></a-sphere>
    <a-sky color="#ECECEC"></a-sky>
  </a-scene>
</body>
</html>

https://aframe.io/examples/
```

<THANKS!></THANKS!>

COMPONENT CLASSES IN ES6

CREATED VS ATTACHED

```
class MyCustomComponent extends HTMLElement {  
  // Fires when an instance of the element is created.  
  createdCallback() {}  
  
  // Fires when an instance was inserted into the document.  
  attachedCallback() {}  
}
```

COMPONENT CLASSES IN ES6

CREATED AND ATTACHED

```
<html>
  <body>
    <my-customcomponent>
    </my-customcomponent>
  </body>
</html>
```

COMPONENT CLASSES IN ES6

CREATED THEN ATTACHED

```
// create
var comp = document.createElement(
  'my-customcomponent');
```

```
// attach
document.body.appendChild(comp);
```

COMPONENT CLASSES IN ES6

ADDING CONTENT PROGRAMMATICALLY

```
createdCallback() {  
  var html = document.createElement("SPAN");  
  html.innerText('hi from custom element');  
  this.appendChild(html);  
}
```

COMPONENT CLASSES IN ES6

ADDING CONTENT VIA TEMPLATES

```
<script src='src/mycomponents.js'></script>
```

```
<template>
  <style>
    my-component span { color: red; }
  </style>

  <span>Hi from custom element</span>
</template>
```

FAT ARROW => FOR SCOPE IN ES6

BEFORE FAT ARROW

```
addEventListeners() {  
  
    var self = this;  
  
    somebutton.addEventListener('click',  
  
        function(event) {  
  
            self.callAFunctionInMyClass();  
  
        } );  
  
    }  
}
```

```
1 var asyncJavaScipt = function(err, callback) {  
2   callback(function(err, callback) {  
3     callback(function(err, callback) {  
4       callback(function(err, callback) {  
5         callback(function(err, callback) {  
6           callback(function(err, callback) {  
7             callback(function(err, callback) {  
8               callback(function(err, callback) {  
9                 console.error('CALLBACK HELL');  
10                });  
11              });  
12            });  
13          });  
14        });  
15      });  
16    });  
17  });  
18 };
```

HELLO FROM CALLBACK HELL

FAT ARROW => FOR SCOPE IN ES6

WITH FAT ARROW

```
addEventListeners() {  
  
    somebutton.addEventListener('click',  
  
        event => this.callAFunctionInMyClass());  
  
}  
  
callAFunctionInMyClass() {  
  
    // "this" is still scoped to the class  
  
}
```

IMPORTS IN ES6

ORGANIZING CODE

```
import Math from './src/math.es6';
```

```
var dist = Math.distance(point1, point2);
```

IMPORTS IN ES6

EXTENDING COMPONENTS

```
import BaseComponent from './src/base.es6';

class ExtendedComponent extends BaseComponent {

}
```