ONELY

How to Make JavaScript Websites **Successful in Google?**

International JavaScript Conference

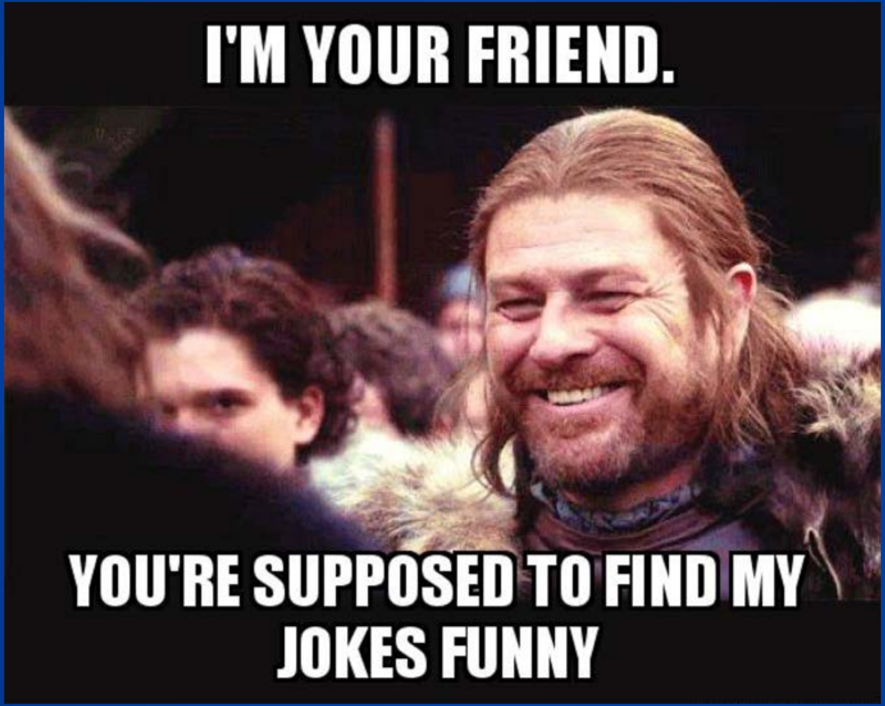
#iJS

@TomekRudzki

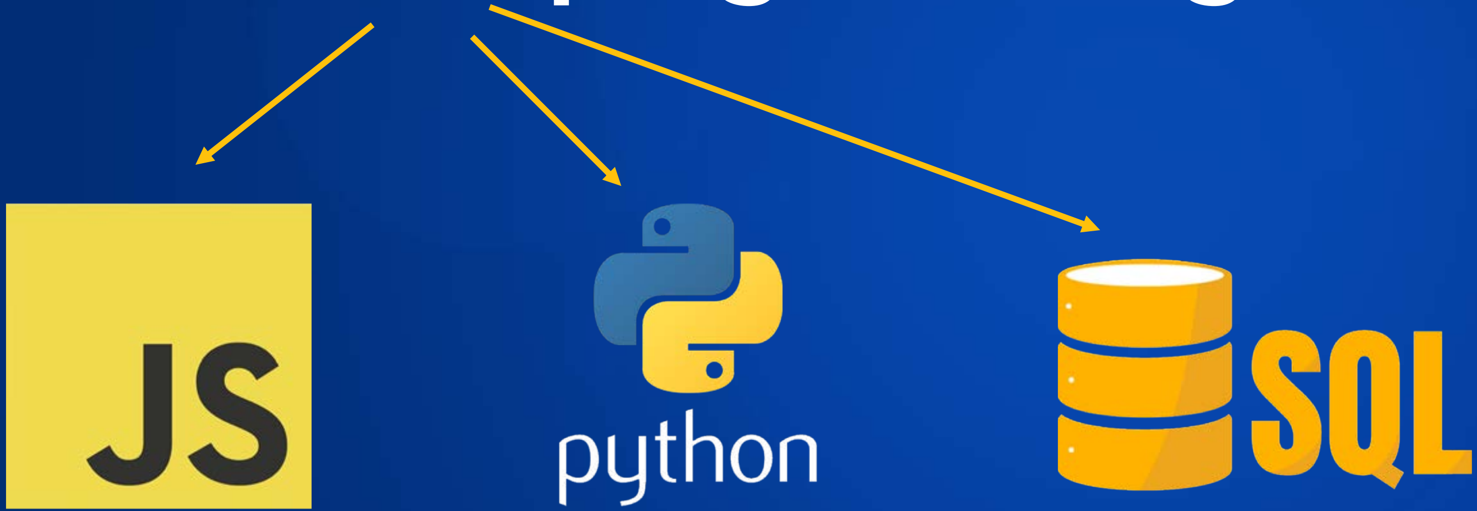
A few words about myself

I’m an SEO guy.

I am not your enemy ;)



I like programming



With my colleagues:

Maria Cieślak

Bartosz Góralewicz

We have literally spent years on:

- researching the JavaScript SEO thing

With my colleagues:

Maria Cieślak

Bartosz Góralewicz

We have literally spent years on:

- researching the JavaScript SEO thing
- helping multiple clients to ensure their JS websites rank high in Google

My Ultimate Guide to JavaScript SEO was extremely viral 👌

So...

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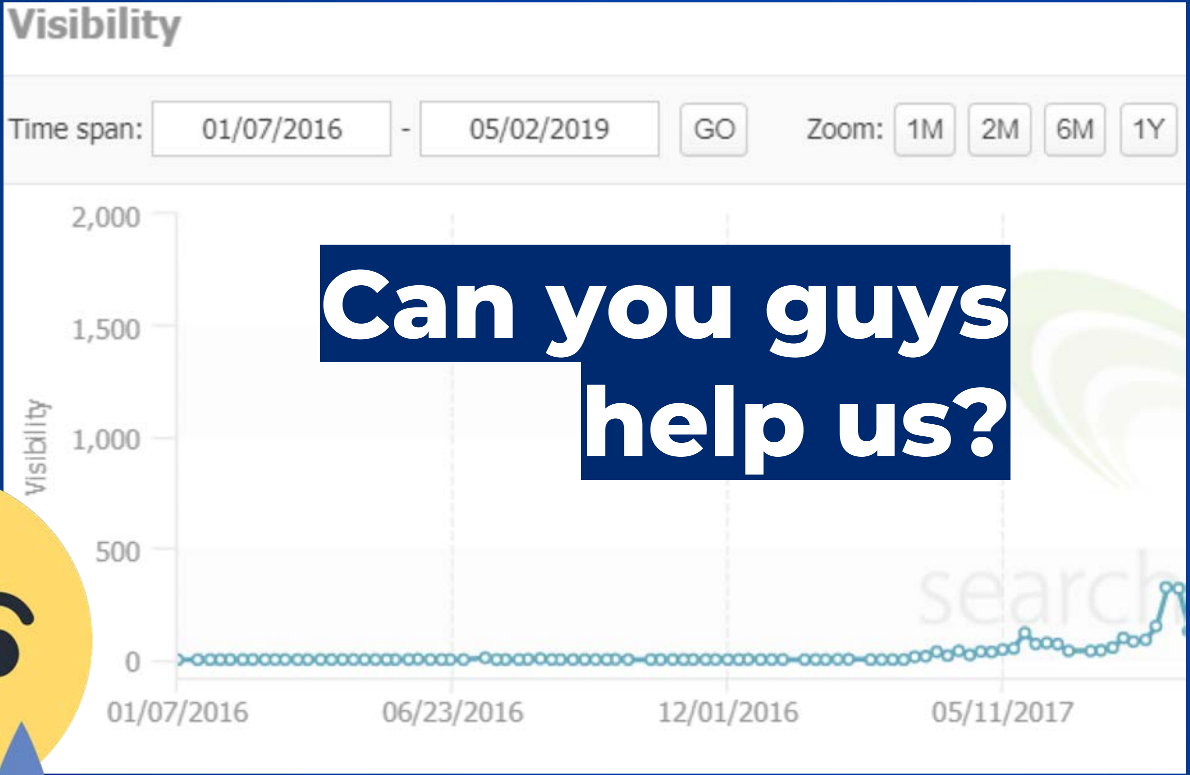
Client:

This is our website. We don't rank in Google.



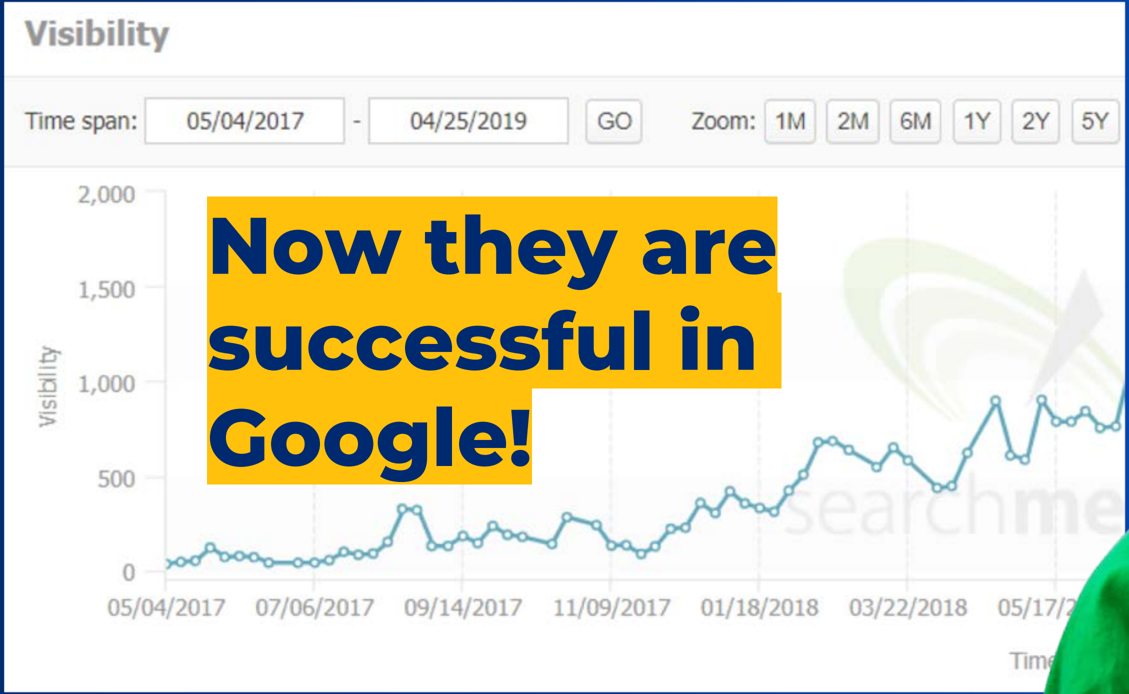
Can you guys help us?

WE WILL FIND THE CAUSE OF YOUR PROBLEMS
AND WILL LET YOU RANK IN GOOGLE
imgflip.com

We will help you.

Finally, we spotted the issue!

A JavaScript loader was the **bad** guy.



Visibility

Time span: 05/04/2017 - 04/25/2019 GO

Zoom: 1M 2M 6M 1Y 2Y 5Y

Now they are successful in Google!

We need to go deeper

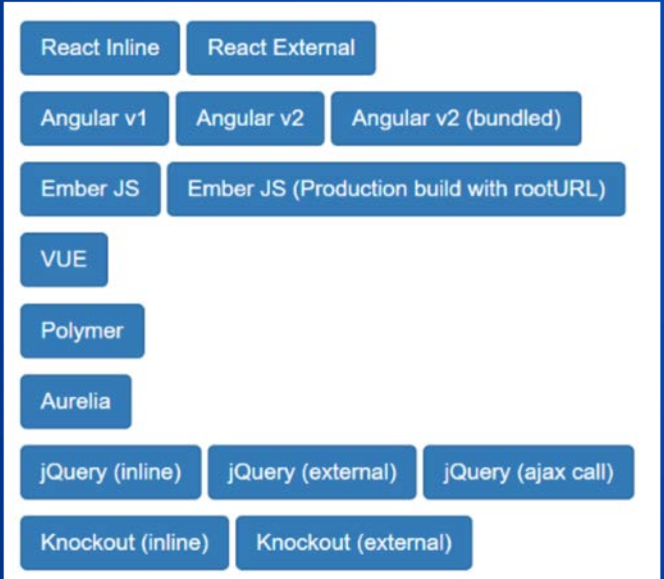
Then we started researching

The JavaScript SEO topic

Yo!

Here is a list of simple Hello World Projects utilising different JS frameworks used for JS crawling tests

JSSEO.expert experiment



“But I am a developer.
Why should I care about traffic from Google?”

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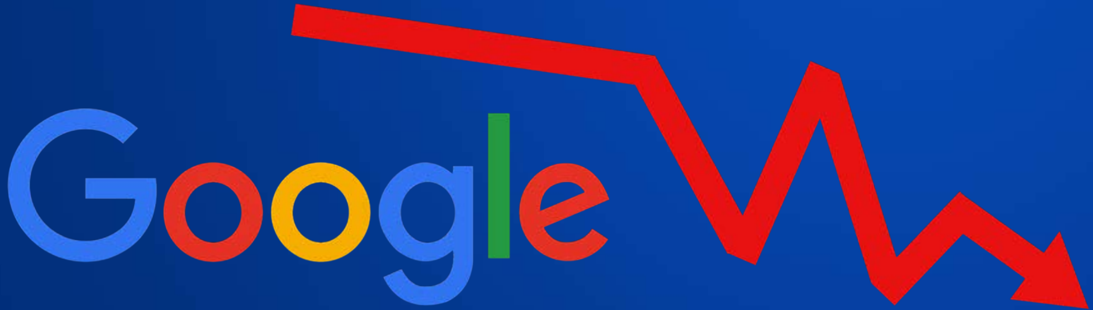
“But I am a developer. Why should I care about traffic from Google?”

- **Traffic from Google = Money**

We SHOULD care about traffic from Google. **It’s REAL.**

- Traffic from Google = Money
- **Poor JavaScript SEO = Google Ranking Drops**



We SHOULD care about traffic from Google. **It’s REAL.**

- Traffic from Google = Money
- Poor JavaScript SEO = Google Ranking Drops
- **Google Ranking Drops = Less money = Angry boss**

We SHOULD care about traffic from Google. **It's REAL.**

- Traffic from Google = Money
- Poor JavaScript SEO = Google Ranking Drops
- Google Ranking Drops = Less money = Angry boss

...and it makes cats grumpy

A few examples of famous JavaScript website drops in Google

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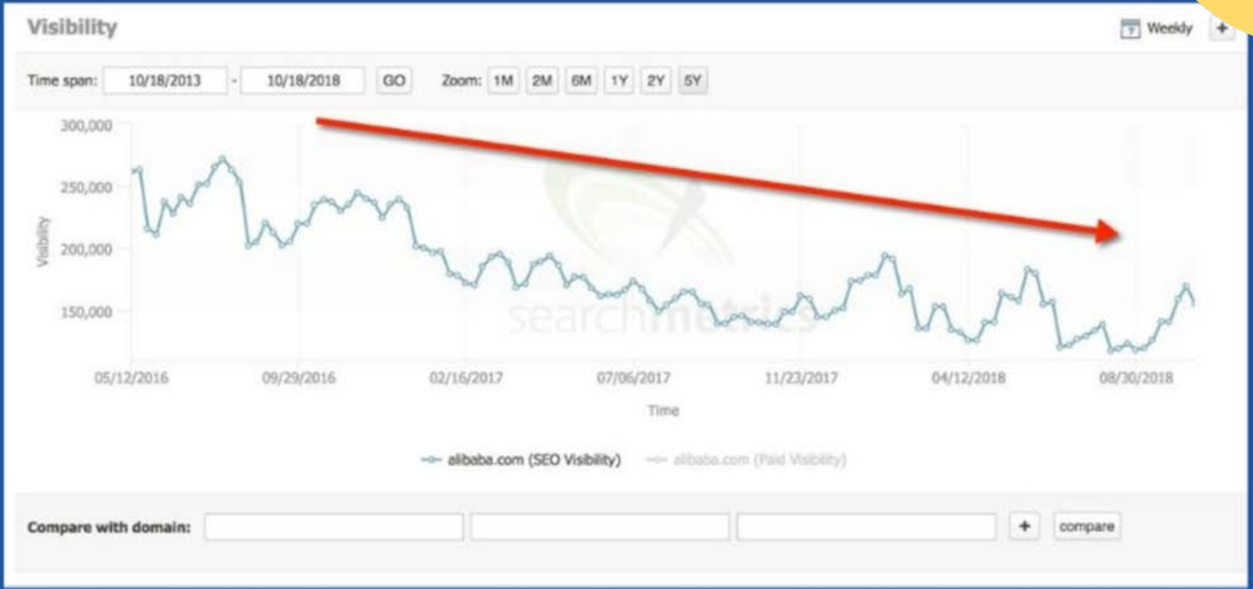
Example #1

Alibaba.com



Visibility

Time span: 10/18/2013 - 10/18/2018

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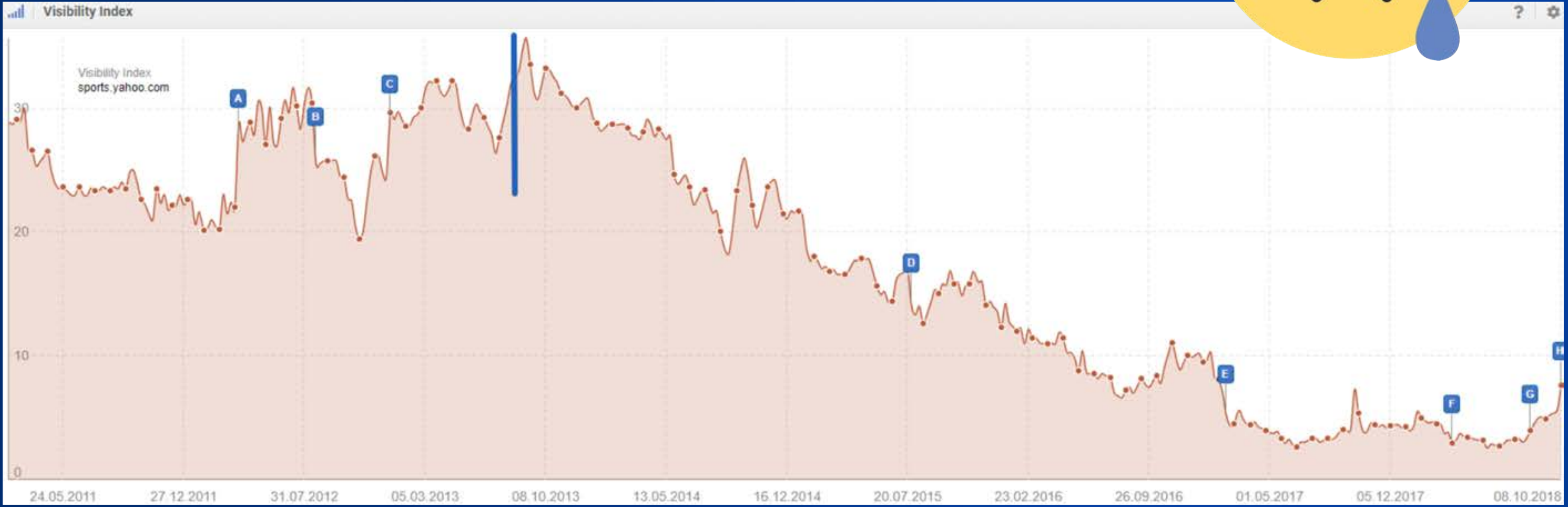
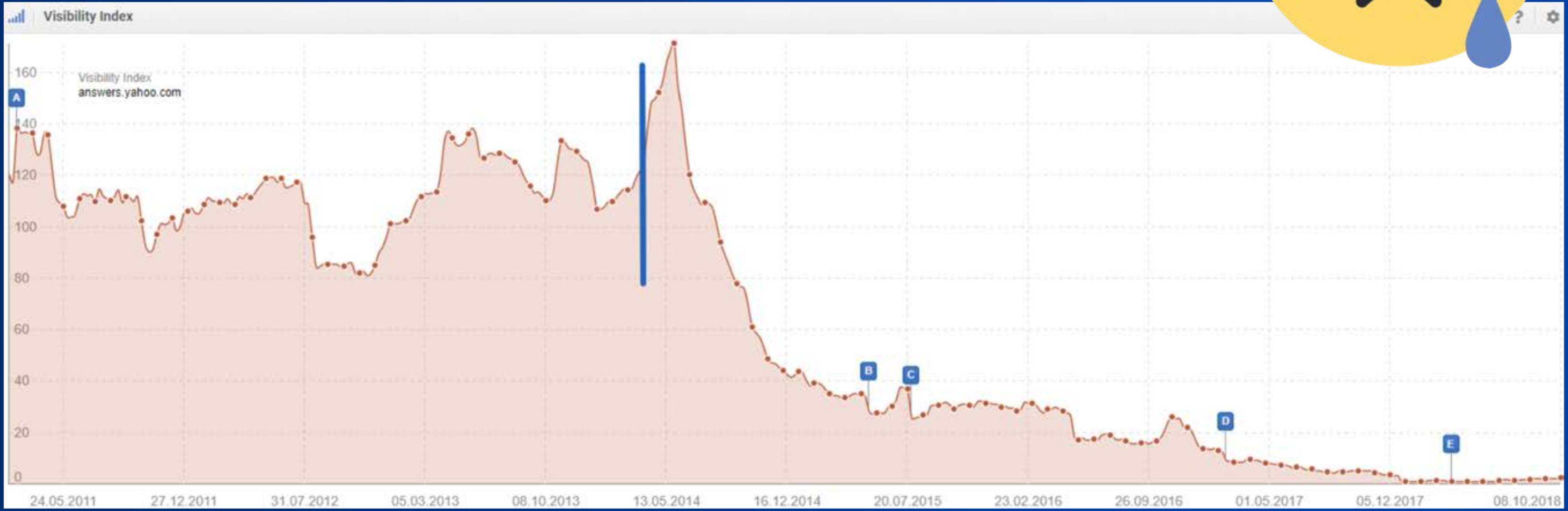
Example #2

sports.yahoo.com

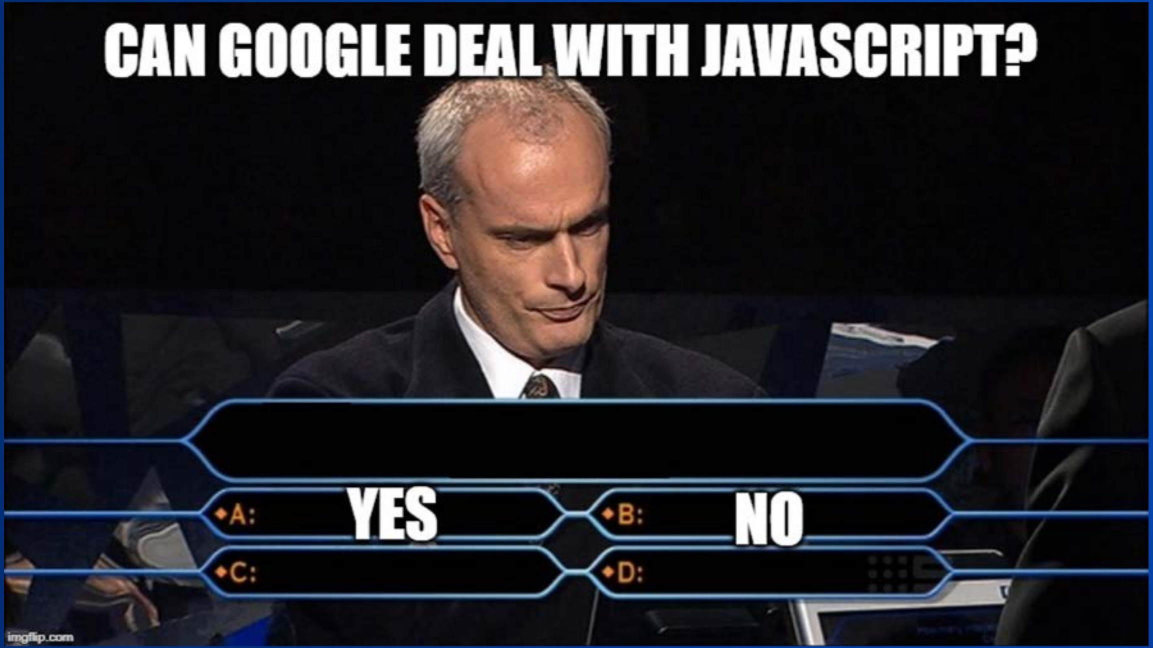


Example #3

answers.yahoo.com



The question...



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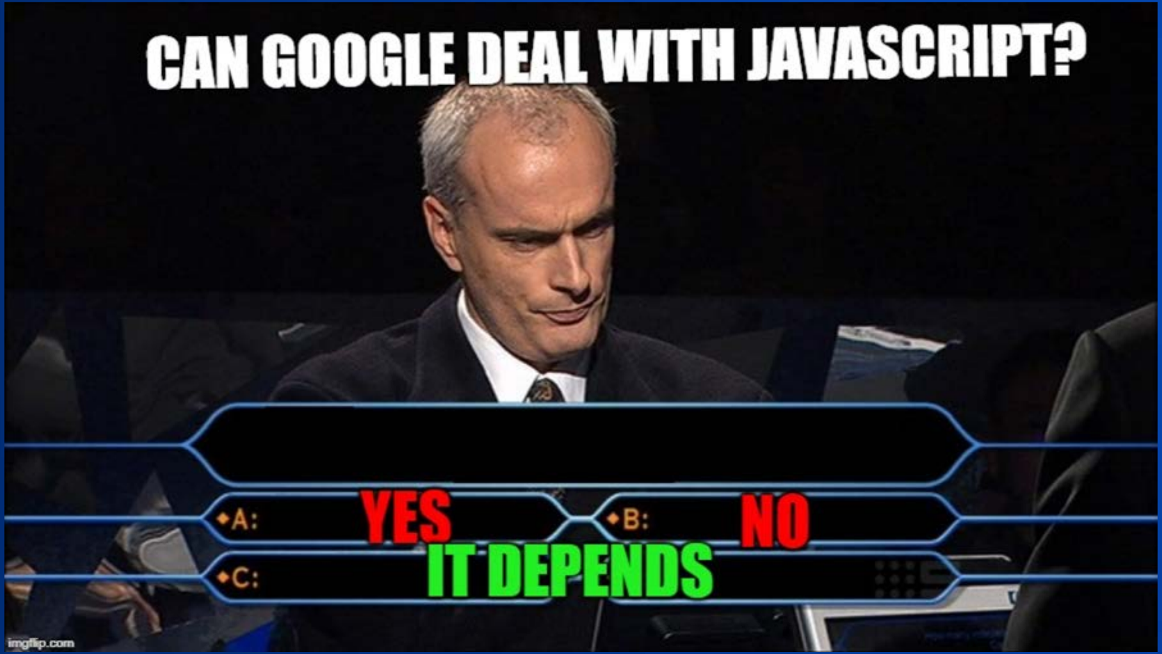
The answer...



What if I told you that Google's not perfect at rendering JS?

Client-side rendering

- the default technique

It's like a cooking recipe - Google and users have to render it on their own.

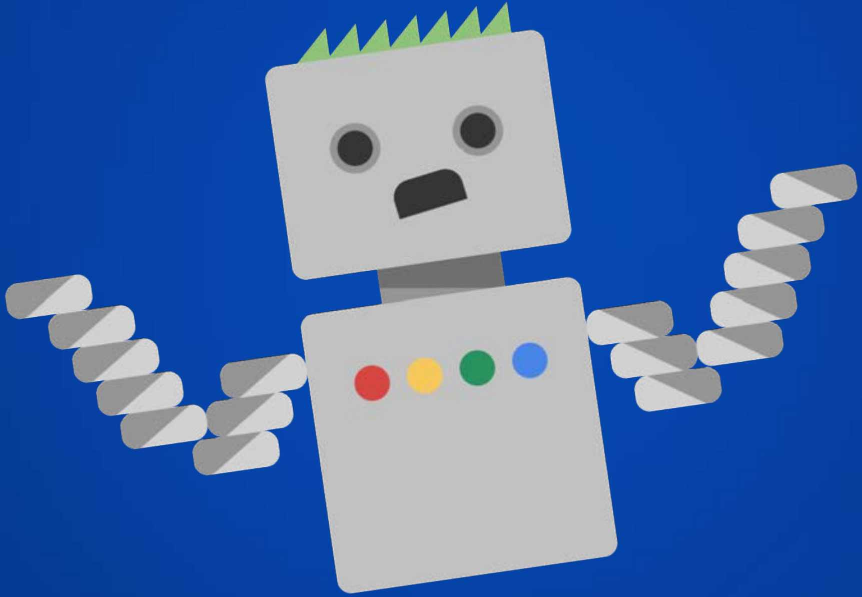
It can be problematic for Google

Yes... Recently, Google did a really good job with updating their Web Rendering Service

BEFORE the 7th of May	AFTER the 7th of May
Google has been using an “ancient” 4-year old browser for rendering - Chrome 41. **It wasn’t even supporting ES6!**	Google Web Rendering Service is based on the most recent version of Chrome ✓

It’s great news, but things are more complicated than that...

...Google is still **not perfect** at rendering JavaScript



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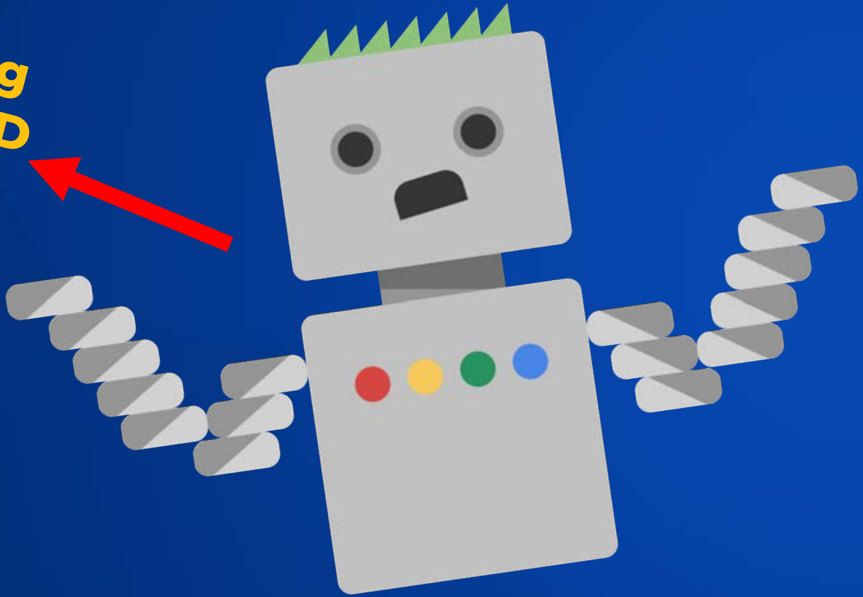
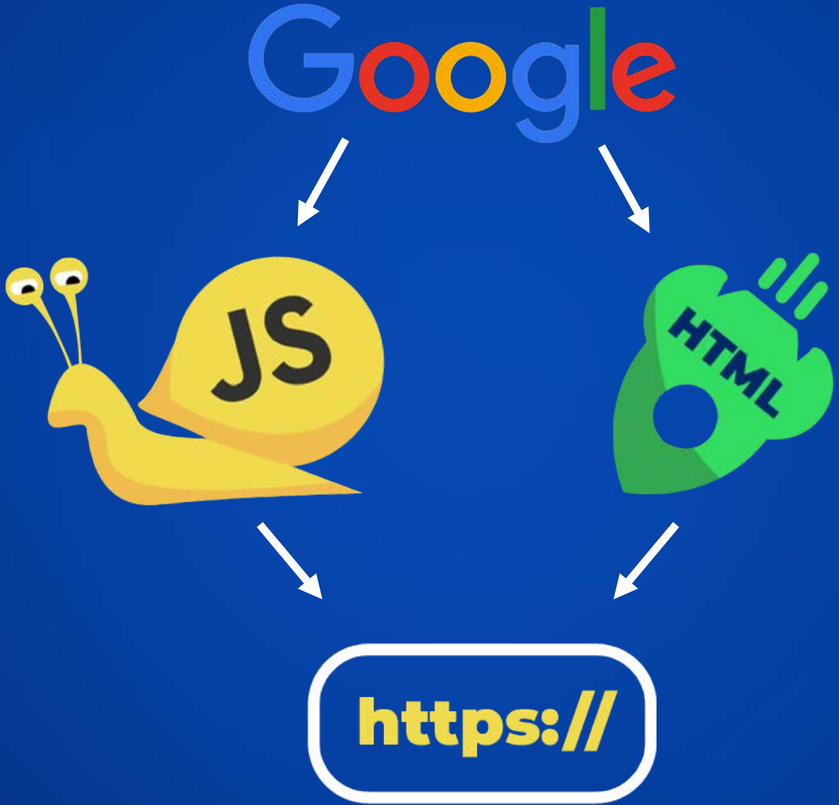
Google is still not perfect at rendering JavaScript



Rendering is DELAYED

Google crawls JavaScript websites

much slower than HTML Pages



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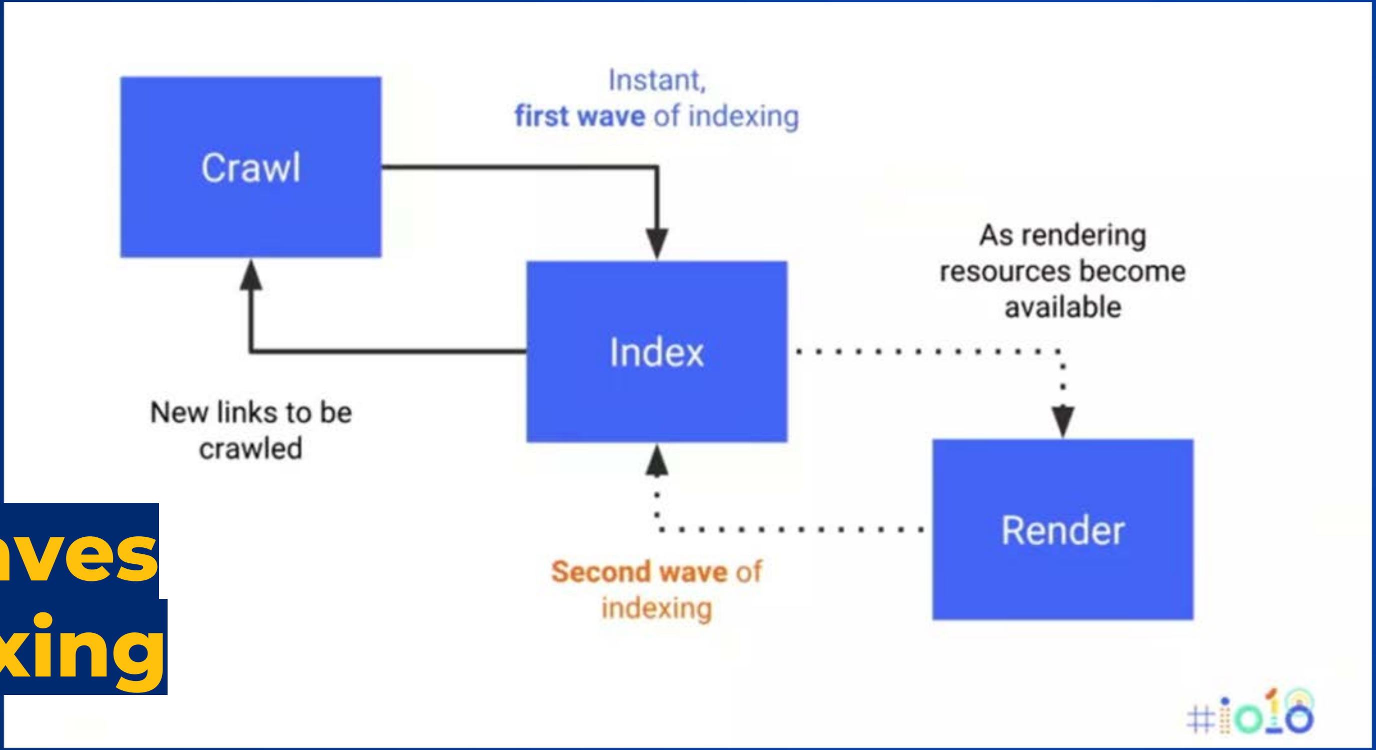
Two waves of indexing



Instant, **first wave** of indexing

Second wave of indexing

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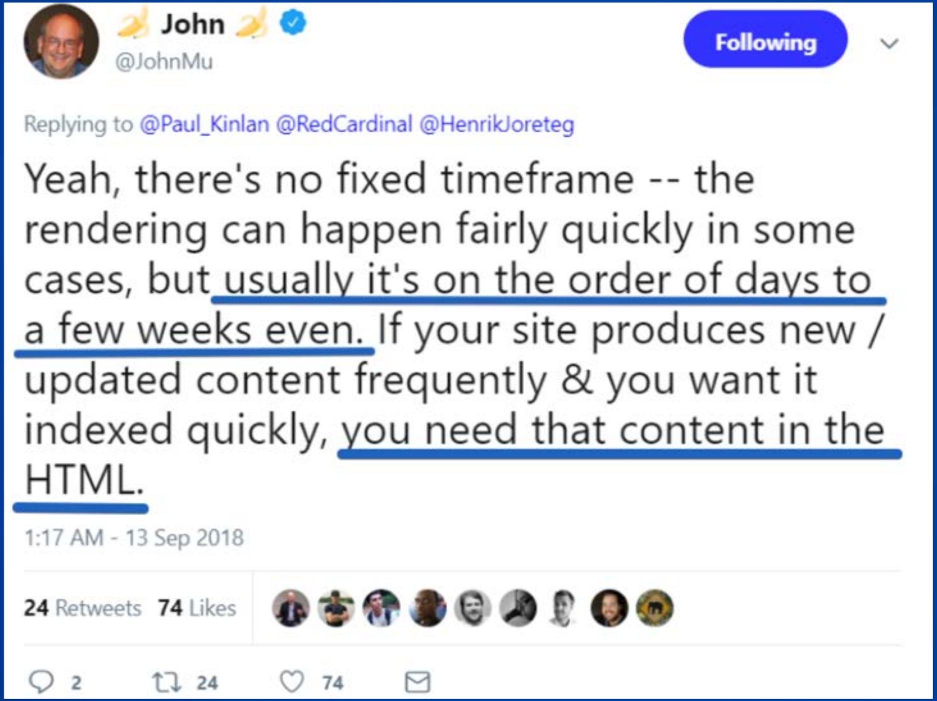
But how long do you HAVE to wait?

Google's John Mueller:
"...usually it's on the order of days to a few weeks even."



John @JohnMu

Following

Replying to @Paul_Kinlan @RedCardinal @HenrikJoreteg

Yeah, there's no fixed timeframe -- the rendering can happen fairly quickly in some cases, but usually it's on the order of days to a few weeks even. If your site produces new / updated content frequently & you want it indexed quickly, you need that content in the HTML.

1:17 AM - 13 Sep 2018

24 Retweets 74 Likes

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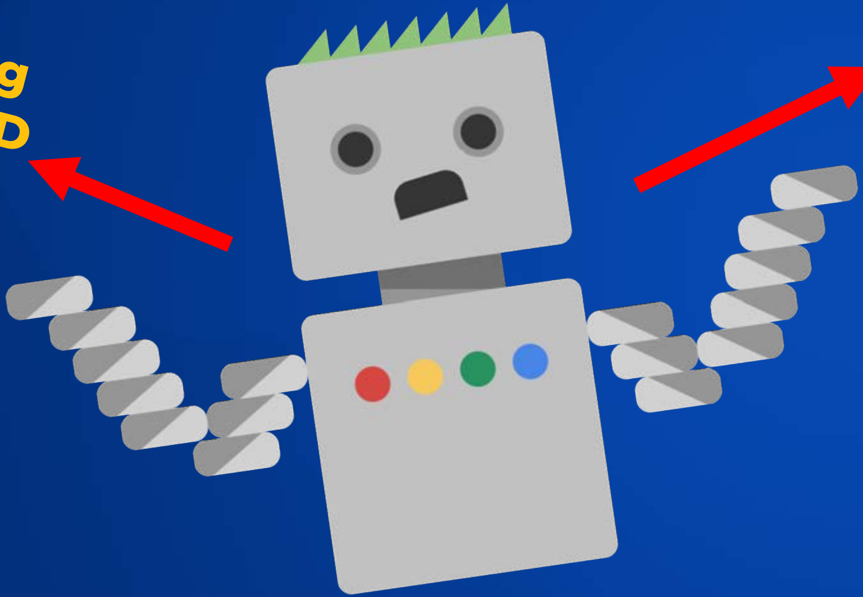
Google is still not perfect at rendering JavaScript



Rendering is DELAYED

Lazy - may not fetch all resources

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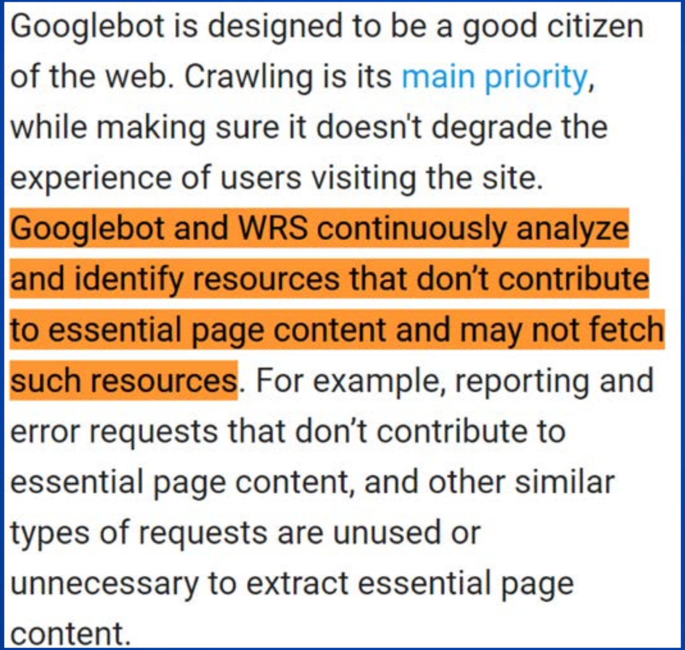
The risk: Google may decide not to fetch some JavaScript resources



Googlebot is designed to be a good citizen of the web. Crawling is its main priority, while making sure it doesn't degrade the experience of users visiting the site. Googlebot and WRS continuously analyze and identify resources that don't contribute to essential page content and may not fetch such resources. For example, reporting and error requests that don't contribute to essential page content, and other similar types of requests are unused or unnecessary to extract essential page content.

The Risk: Google may decide not to fetch some JavaScript resources

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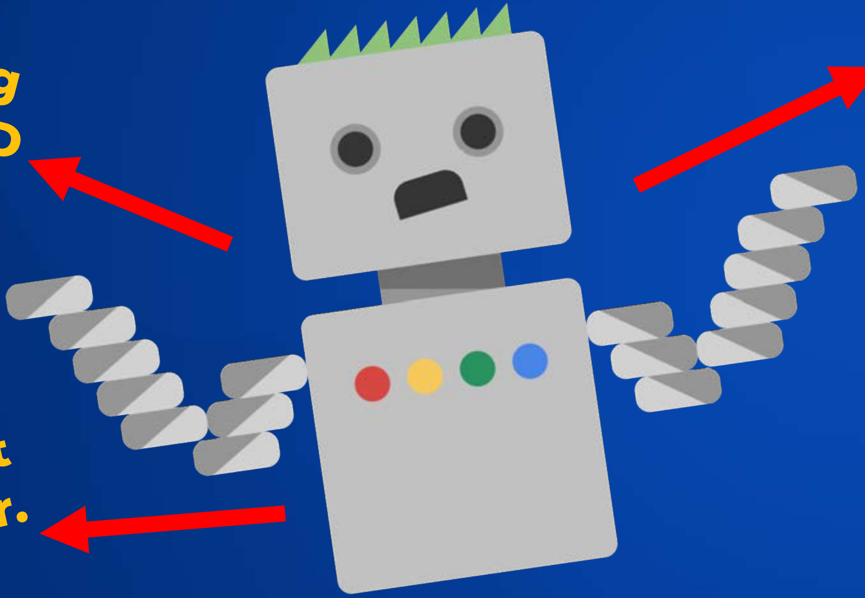
Google is still not perfect at rendering JavaScript



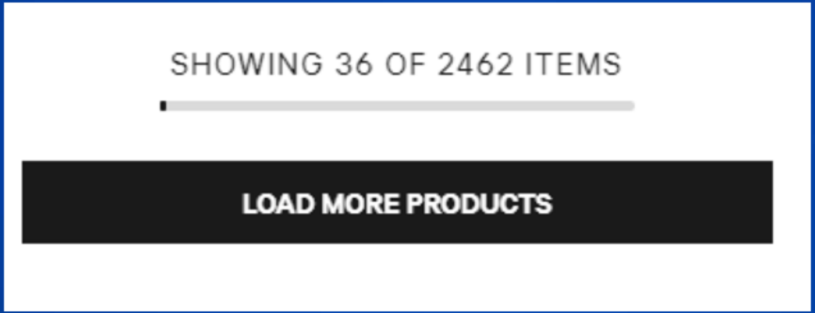
Rendering is DELAYED

Lazy - may not fetch all resources

Googlebot doesn't act like a real user.

Googlebot doesn't act like a real user

It **doesn't** click the buttons



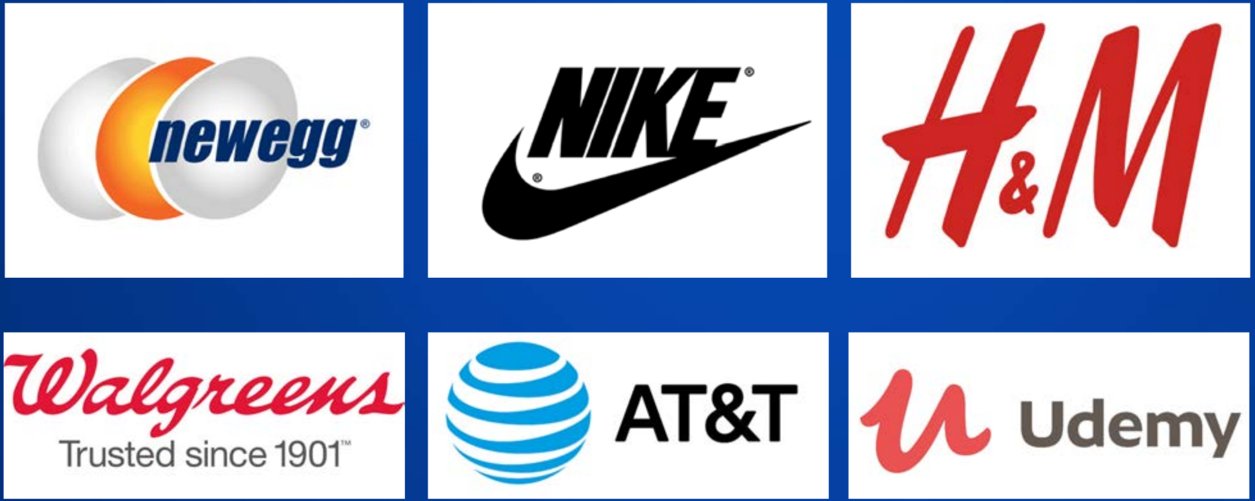
SHOWING 36 OF 2462 ITEMS

It **doesn't** scroll!

Watch out for your infinite scrolling!

There are still many websites that implement infinite scrolling incorrectly...

In the case of these websites Googlebot **cannot** access the second page of pagination.



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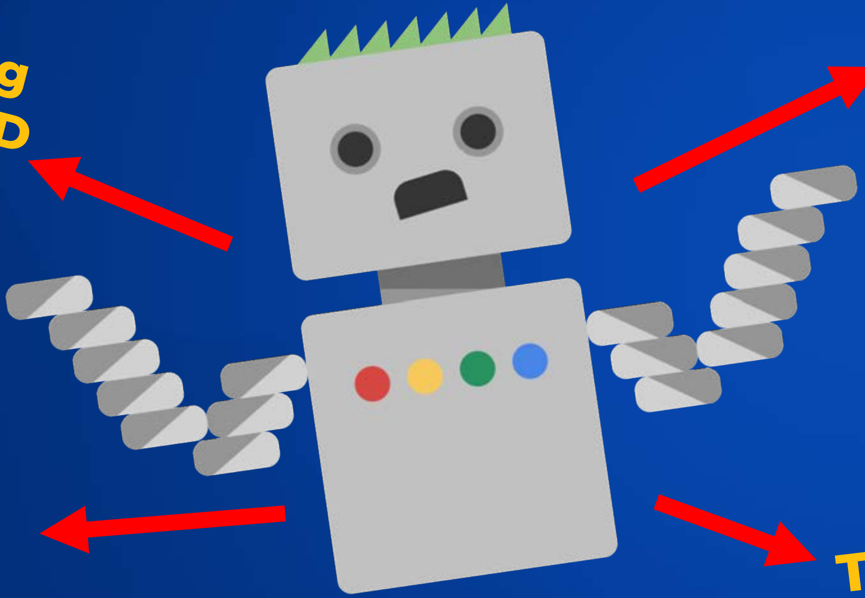
Google is still not perfect at rendering JavaScript



Rendering is DELAYED

Lazy - may not fetch all resources

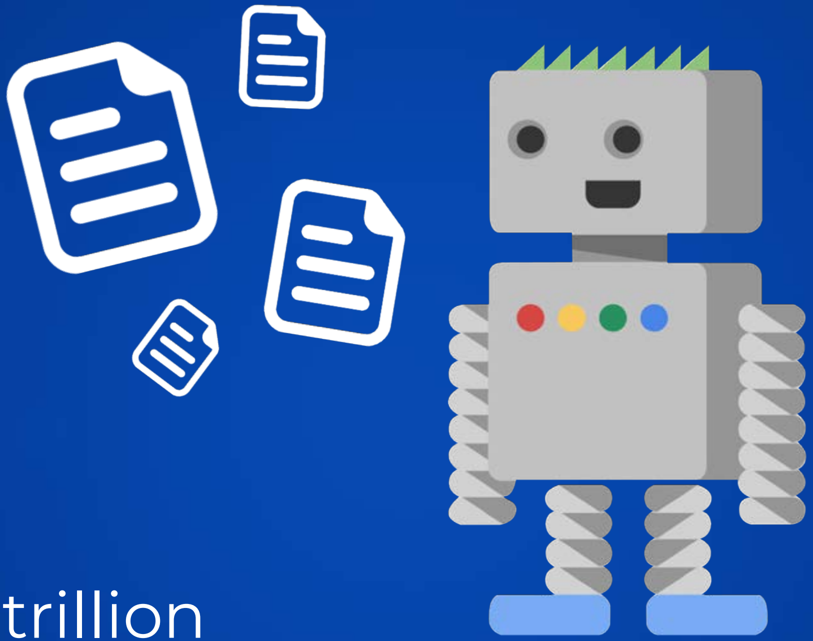
Doesn't scroll or click the buttons

Timeouts

Google's rendering of JavaScript is not perfect

TIMEOUTS

Google limits:
TIMEOUTS

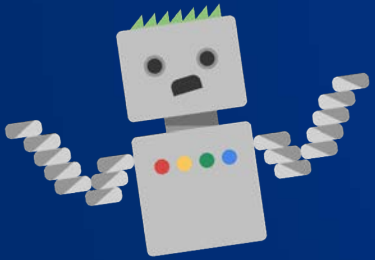


Remember: There are 130 trillion other documents waiting for Googlebot’s visit

Googlebot is based on the newest version of Chrome. BUT it's not the same!

For instance:

- Googlebot declines user permission requests



- Cookies, local & session storage are cleared across page loads

- Browser always download all the resources

Googlebot may not...

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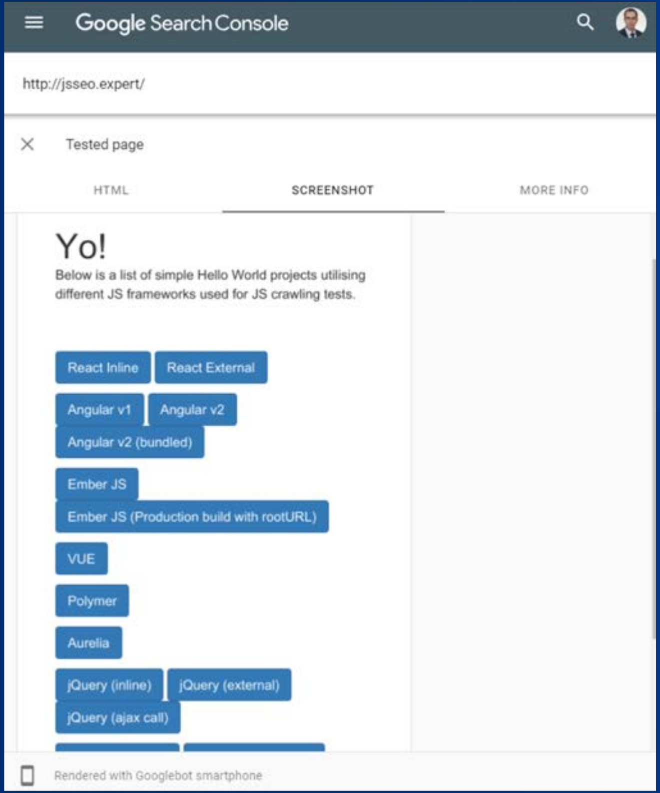

Google Search Console

http://jsseo.expert/

Tested page

HTML SCREENSHOT MORE INFO

Yo!

Below is a list of simple Hello World projects utilising different JS frameworks used for JS crawling tests.

React Inline | React External

Angular v1 | Angular v2

Angular v2 (bundled)

Ember JS

Ember JS (Production build with rootURL)

VUE

Polymer

Aurelia

jQuery (inline) | jQuery (external)

jQuery (ajax call)

Rendered with Googlebot smartphone

Always check if Google has no issues with rendering your website

Best tool:
URL Inspection Tool (a part of Google Search Console).
Avoid using Chrome for it.

Google's rendering errors may be a big deal

Google encounters rendering errors → Google stops executing JavaScript

→ No content indexed → **No money**

Angular.io had JavaScript SEO issues in the past

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The issue: Google deindexed many pages of Angular.io due to rendering errors

Igor Minar from Angular.io:

“Given that we haven’t changed the problematic code in 8 months (...)

I believe that something has changed in crawlers during this period of time which caused most of the site to be de-indexed, which then resulted in the traffic loss.”

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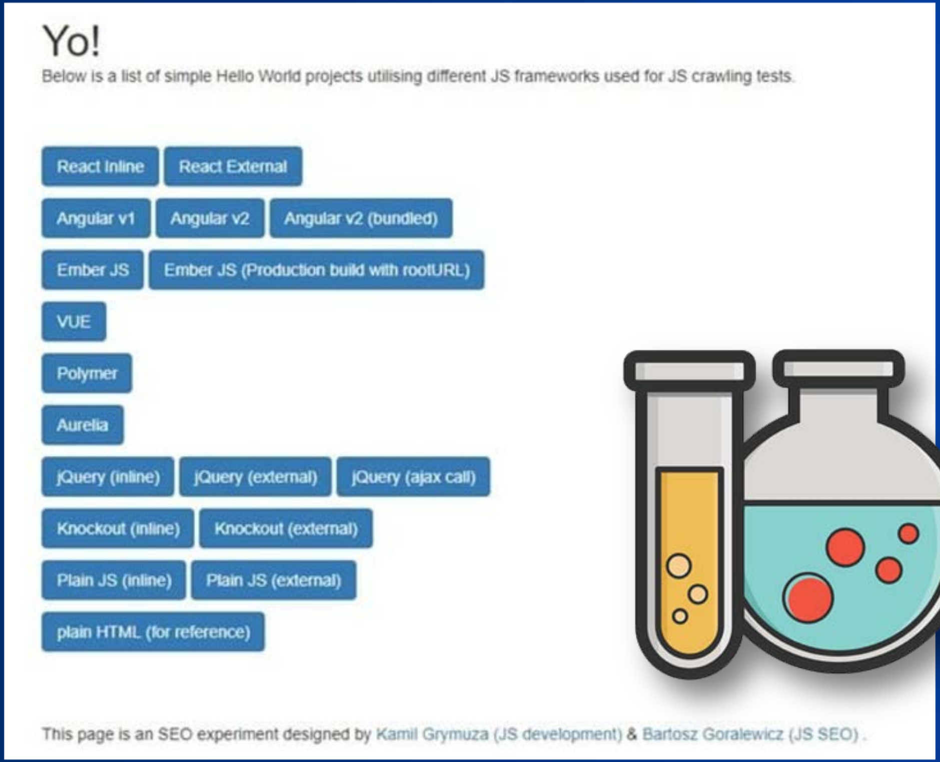


Yo!

Below is a list of simple Hello World projects utilising different JS frameworks used for JS crawling tests.

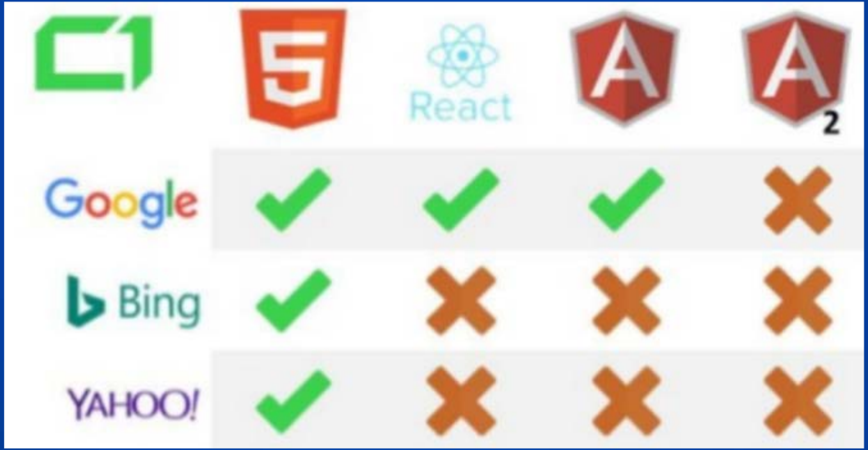
This page is an SEO experiment designed by Kamil Grymuza (JS development) & Bartosz Goralewicz (JS SEO) .

Let’s go back to our experiment...

JSSEO.expert

Initial results:

Google DOESN'T support Angular 2



C1	5	React	A	A 2
Google	✓	✓	✓	✗
Bing	✓	✗	✗	✗
YAHOO!	✓	✗	✗	✗

Initial results:

Google DOESN'T support Angular 2

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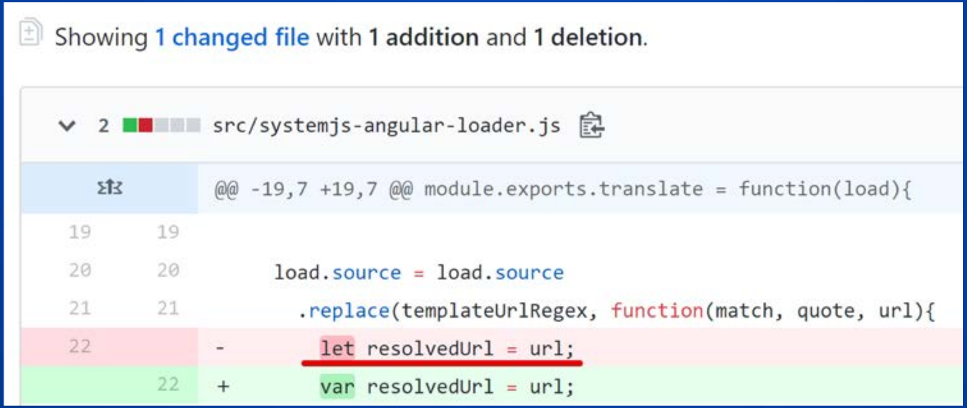
Google didn't index our Angular experiment because of...

errors in the official Angular documentation



Showing 1 changed file with 1 addition and 1 deletion.

```
2 src/systemjs-angular-loader.js
@@ -19,7 +19,7 @@ module.exports.translate = function(load){

        load.source = load.source
          .replace(templateUrlRegex, function(match, quote, url){
-           let resolvedUrl = url;
+           var resolvedUrl = url;
```

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Now we know about Google's **limitations in rendering JavaScript**

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JavaScript SEO

Taming the Beast in 5 Easy Steps

International JavaScript Conference

#iJS

@TomekRudzki

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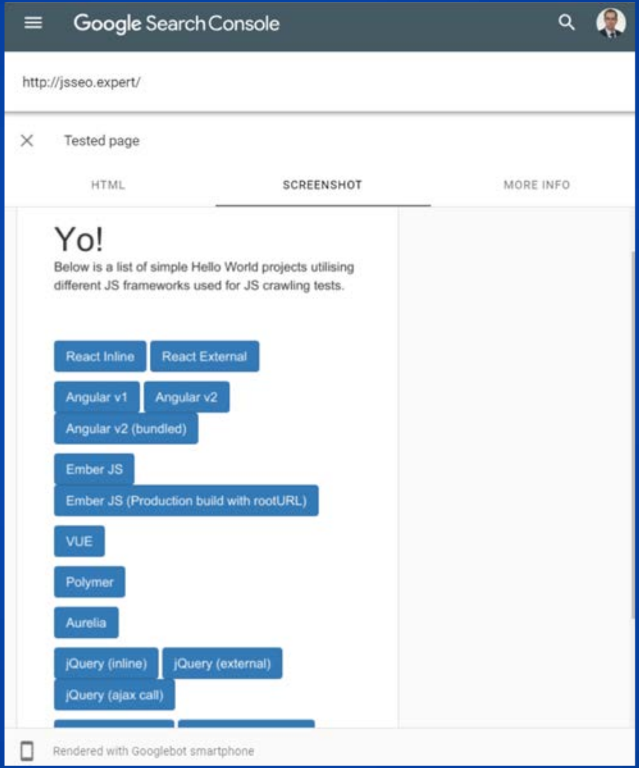
Step 1

Ensure that Google can render your content

Use the URL inspection tool provided by Google

- **It's free**



Yo!

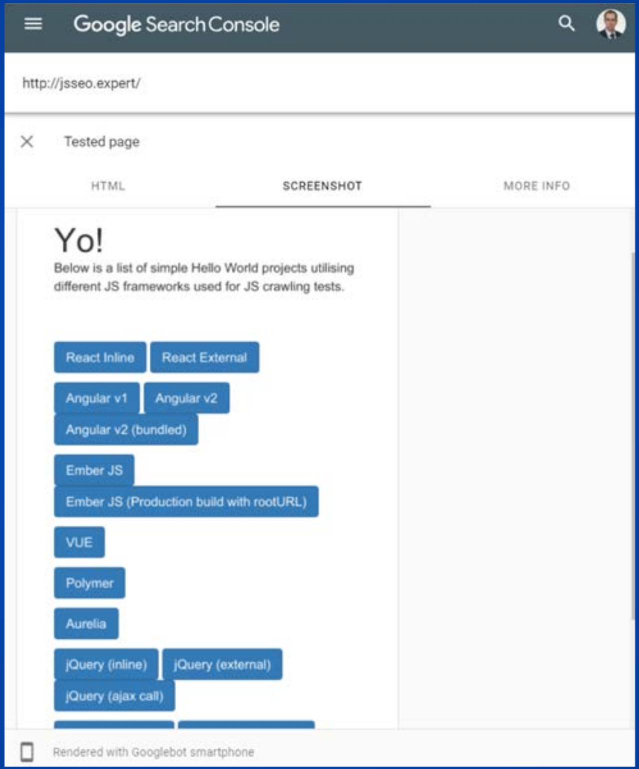
Below is a list of simple Hello World projects utilising different JS frameworks used for JS crawling tests.

Step 1

Ensure that Google can render your content

Use the URL inspection tool provided by Google

- It's free
- **It shows rendering errors**



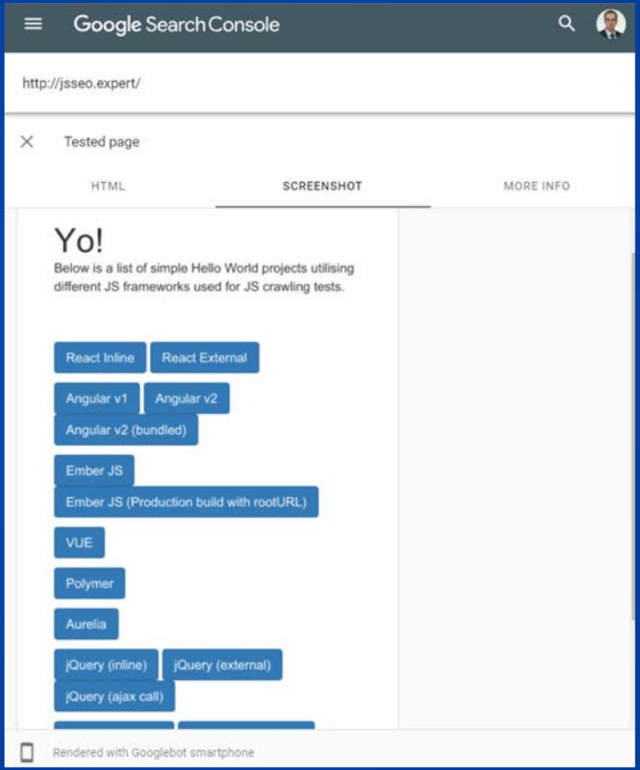
http://jsseo.expert/

Yo!

Below is a list of simple Hello World projects utilising different JS frameworks used for JS crawling tests.

ONELY

Ask yourself the following questions

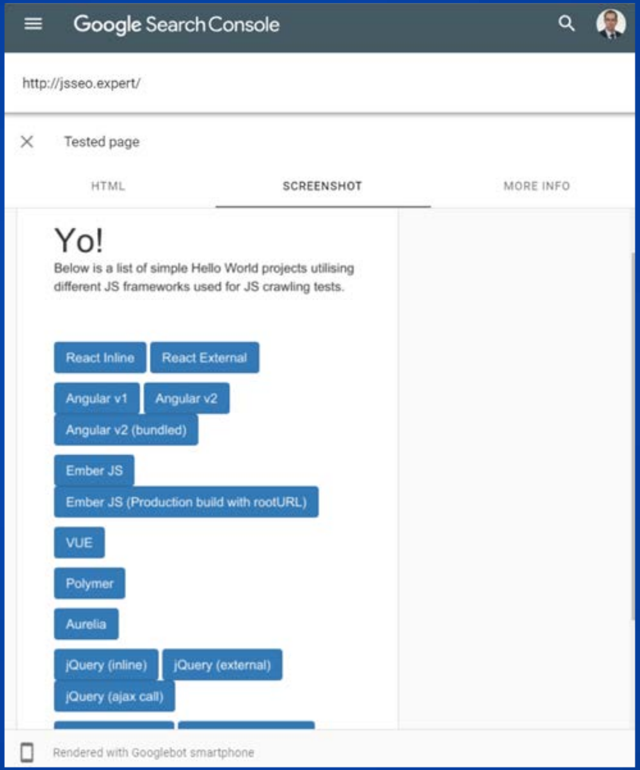


Yo!

Below is a list of simple Hello World projects utilising different JS frameworks used for JS crawling tests.

Ask yourself the following questions

- Is the main content visible?



http://jsseo.expert/

Yo!

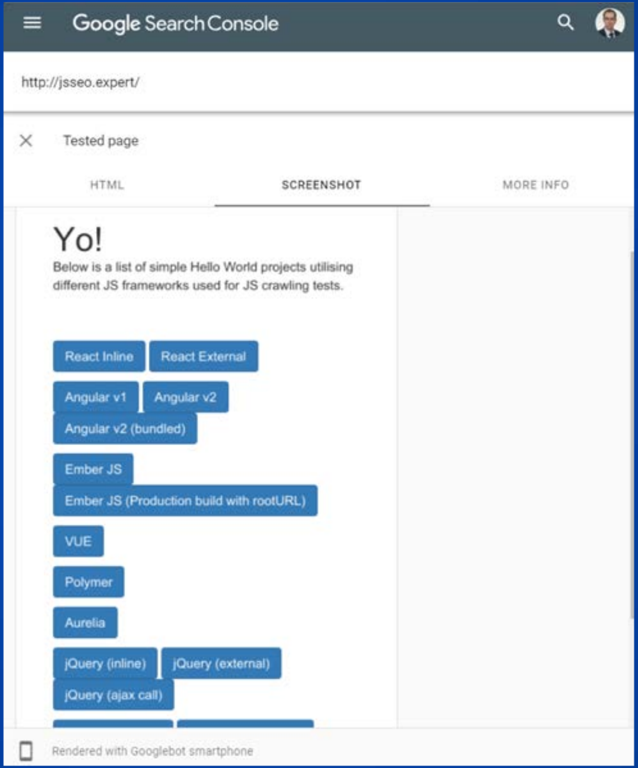
Below is a list of simple Hello World projects utilising different JS frameworks used for JS crawling tests.

Rendered with Googlebot smartphone

ONELY

Ask yourself the following questions

- Is the main content visible?
- Can Google see the user-generated comments?



http://jsseo.expert/

Tested page

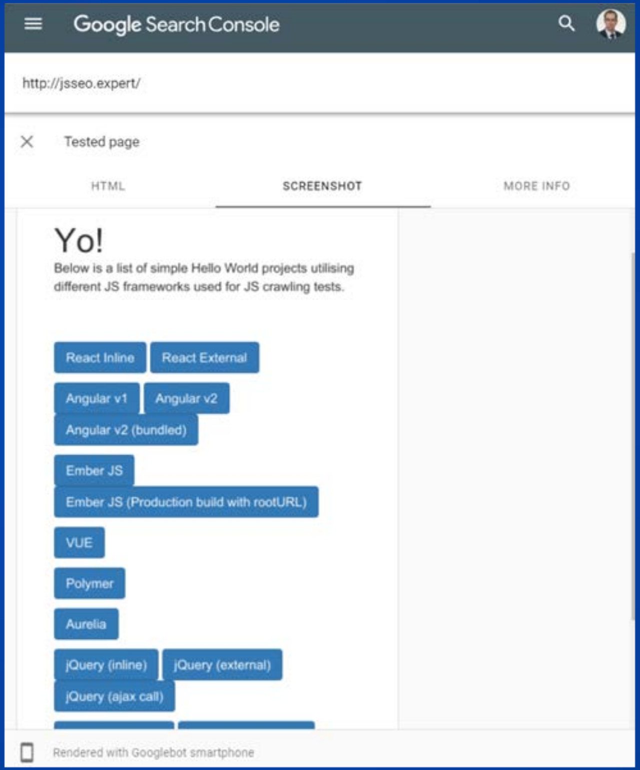
Yo!

Below is a list of simple Hello World projects utilising different JS frameworks used for JS crawling tests.

Rendered with Googlebot smartphone

Ask yourself the following questions

- Is the main content visible?
- Can Google see the user-generated comments?
- Can Google access areas like similar articles and products?



http://jsseo.expert/

Tested page

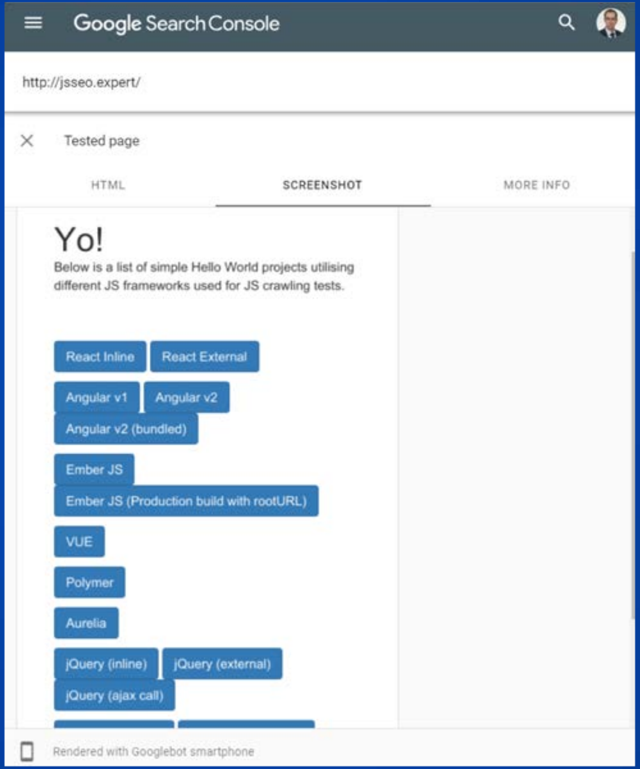
Yo!

Below is a list of simple Hello World projects utilising different JS frameworks used for JS crawling tests.

Rendered with Googlebot smartphone

Ask yourself the following questions

- Is the main content visible?
- Can Google see the user-generated comments?
- Can Google access areas like similar articles and products?
- Can Google see other crucial elements of your page?



Google Search Console

http://jsseo.expert/

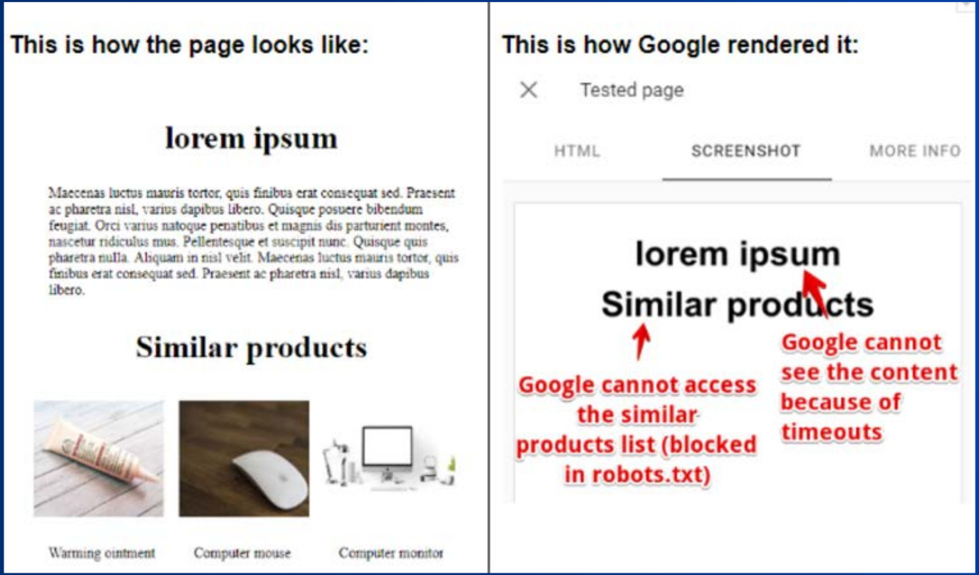
Tested page

Yo!

Below is a list of simple Hello World projects utilising different JS frameworks used for JS crawling tests.

Rendered with Googlebot smartphone

What if Google cannot render your page properly?



This is how the page looks like:

lorem ipsum

Maecenas luctus mauris tortor, quis finibus erat consequat sed. Praesent ac pharetra nisl, varius dapibus libero. Quisque posuere bibendum feugiat. Orci varius natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Pellentesque et suscipit nunc. Quisque quis pharetra nulla. Aliquam in nisl velit. Maecenas luctus mauris tortor, quis finibus erat consequat sed. Praesent ac pharetra nisl, varius dapibus libero.

Similar products

Warming ointment

Computer mouse

Computer monitor

This is how Google rendered it:

lorem ipsum

Similar products

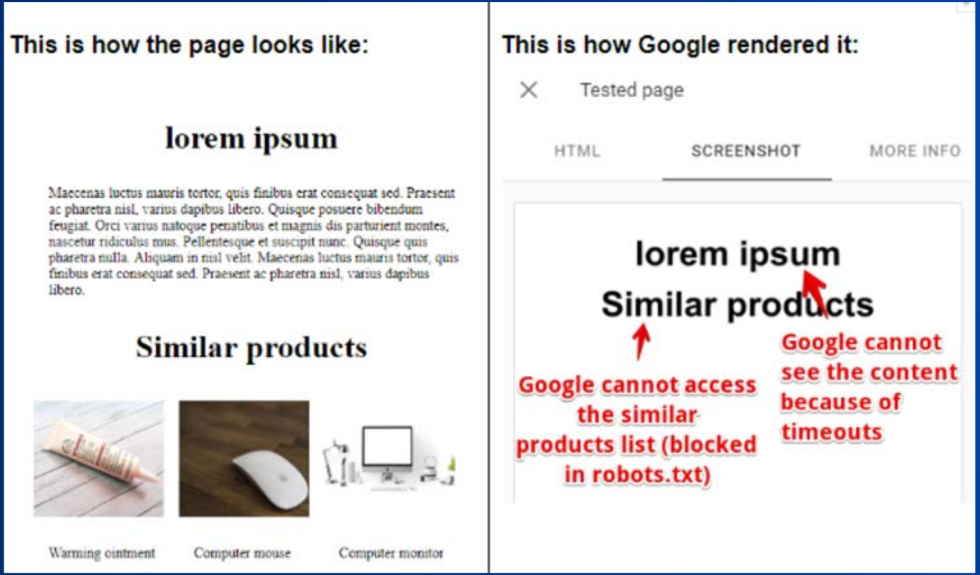
Google cannot access the similar products list (blocked in robots.txt)

Google cannot see the content because of timeouts

Here are some possible reasons:

- **Google encountered timeouts while rendering**

What if Google cannot render your page properly?



This is how the page looks like:

lorem ipsum

Maecenas luctus mauris tortor, quis finibus erat consequat sed. Praesent ac pharetra nisl, varius dapibus libero. Quisque posuere bibendum feugiat. Orci varius natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Pellentesque et suscipit nunc. Quisque quis pharetra nulla. Aliquam in nisl velit. Maecenas luctus mauris tortor, quis finibus erat consequat sed. Praesent ac pharetra nisl, varius dapibus libero.

Similar products

Warming ointment | Computer mouse | Computer monitor

This is how Google rendered it:

lorem ipsum

Similar products

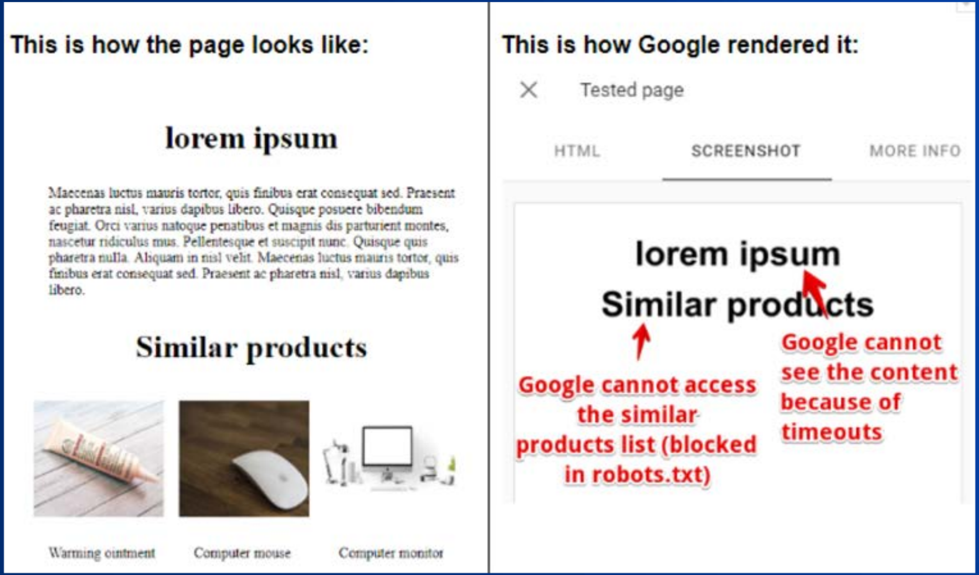
Google cannot access the similar products list (blocked in robots.txt)

Google cannot see the content because of timeouts

Here are some possible reasons:

- Google encountered timeouts while rendering
- **Some errors occurred while rendering**

What if Google cannot render your page properly?



This is how the page looks like:

lorem ipsum

Maecenas luctus mauris tortor, quis finibus erat consequat sed. Praesent ac pharetra nisl, varius dapibus libero. Quisque posuere bibendum feugiat. Orci varius natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Pellentesque et suscipit nunc. Quisque quis pharetra nulla. Aliquam in nisl velit. Maecenas luctus mauris tortor, quis finibus erat consequat sed. Praesent ac pharetra nisl, varius dapibus libero.

Similar products

Warming ointment

Computer mouse

Computer monitor

This is how Google rendered it:

lorem ipsum

Similar products

Google cannot access the similar products list (blocked in robots.txt)

Google cannot see the content because of timeouts

Here are some possible reasons:

- Google encountered timeouts while rendering
- Some errors occurred while rendering
- **You blocked crucial JavaScript files for Googlebot**

Step 2

Make sure you didn't block your crucial JavaScript files in robots.txt

What is robots.txt?

robots.txt

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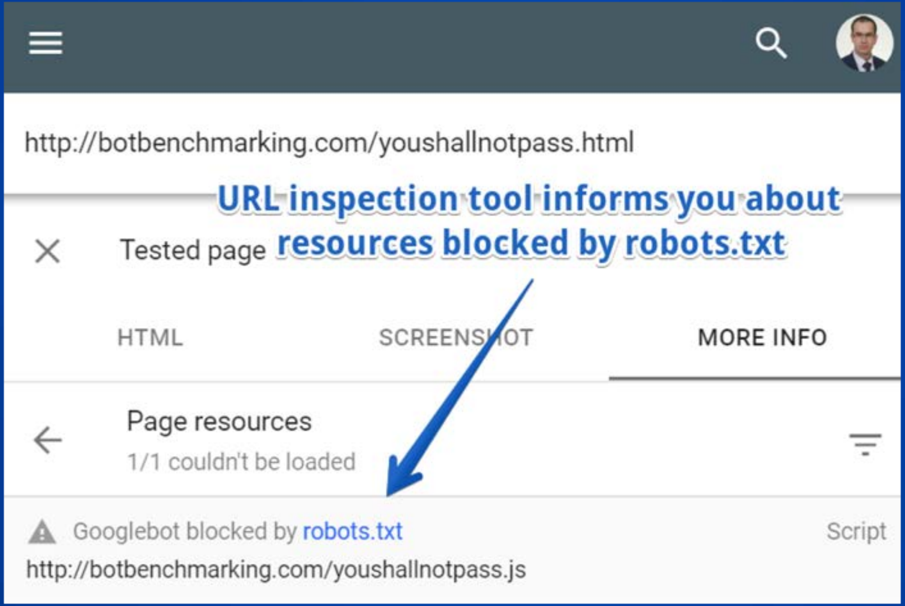
Step 2

Make sure you didn't block your crucial JavaScript files in robots.txt

Google's URL inspection tool comes to the rescue!



http://botbenchmarking.com/youshallnotpass.html

URL inspection tool informs you about resources blocked by robots.txt

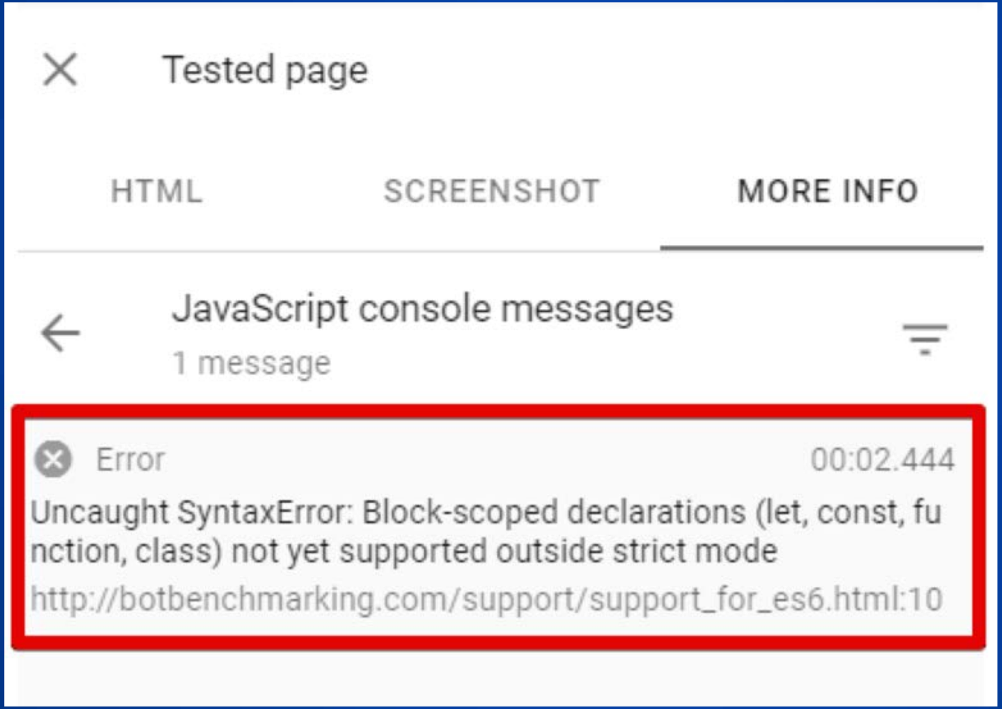
Page resources
1/1 couldn't be loaded

Googlebot blocked by robots.txt — Script
http://botbenchmarking.com/youshallnotpass.js

ONELY

Step 3

Use the URL Inspection tool for spotting JavaScript errors



JavaScript console messages

1 message

Error 00:02.444

Uncaught SyntaxError: Block-scoped declarations (let, const, function, class) not yet supported outside strict mode

http://botbenchmarking.com/support/support_for_es6.html:10

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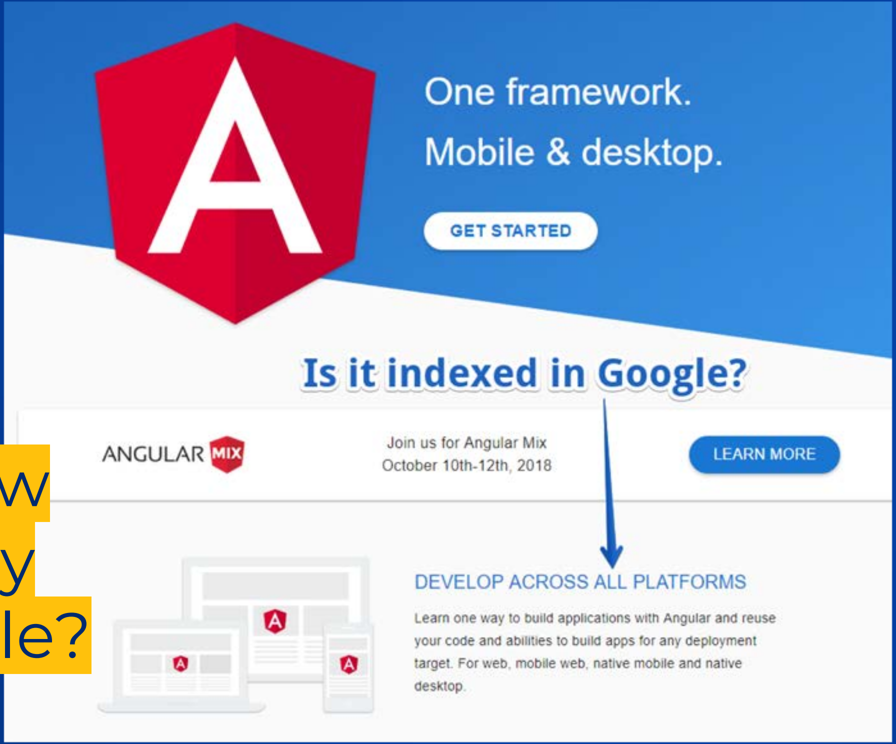
Step 4

Check if your content has been indexed in Google

How do you know if content is really indexed in Google?



One framework.

Mobile & desktop.

GET STARTED

Is it indexed in Google?

ANGULAR MIX

Join us for Angular Mix
October 10th-12th, 2018

LEARN MORE

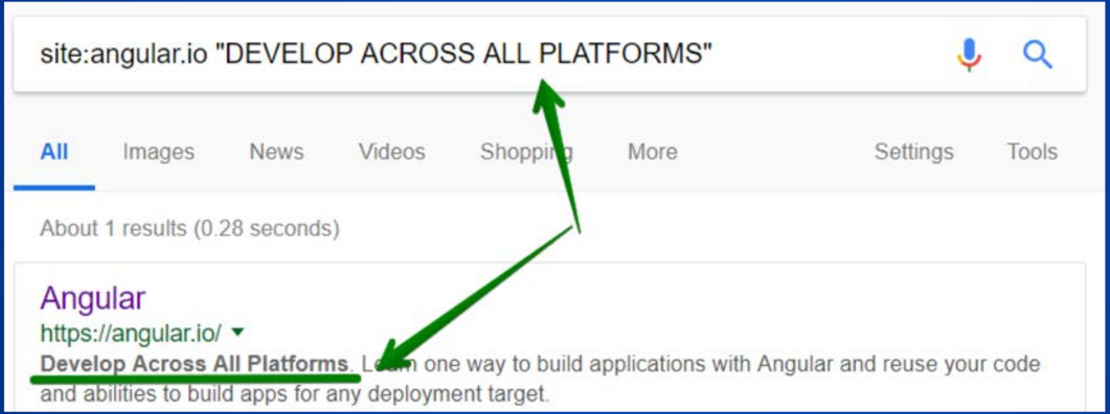
DEVELOP ACROSS ALL PLATFORMS

Learn one way to build applications with Angular and reuse your code and abilities to build apps for any deployment target. For web, mobile web, native mobile and native desktop.

Step 4

Check if your content has been indexed in Google

site:URL “fragment”

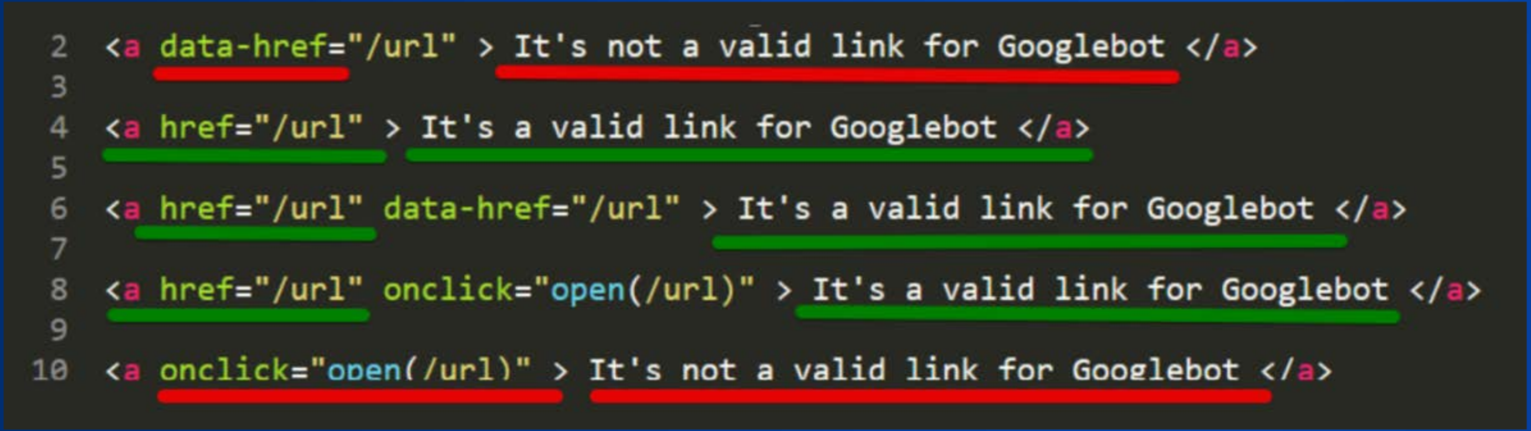


site:angular.io "DEVELOP ACROSS ALL PLATFORMS"

About 1 results (0.28 seconds)

Angular
https://angular.io/
Develop Across All Platforms. Learn one way to build applications with Angular and reuse your code and abilities to build apps for any deployment target.

Step 5 Make sure Google can discover your internal links



```
<a data-href="/url" > It's not a valid link for Googlebot </a>

<a href="/url" > It's a valid link for Googlebot </a>

<a href="/url" data-href="/url" > It's a valid link for Googlebot </a>

<a href="/url" onclick="open(/url)" > It's a valid link for Googlebot </a>

<a onclick="open(/url)" > It's not a valid link for Googlebot </a>
```

Google needs proper <a href> links to discover the URLs on your website

If you followed these 5 steps and it still doesn't work...

Consider dynamic rendering or hybrid rendering

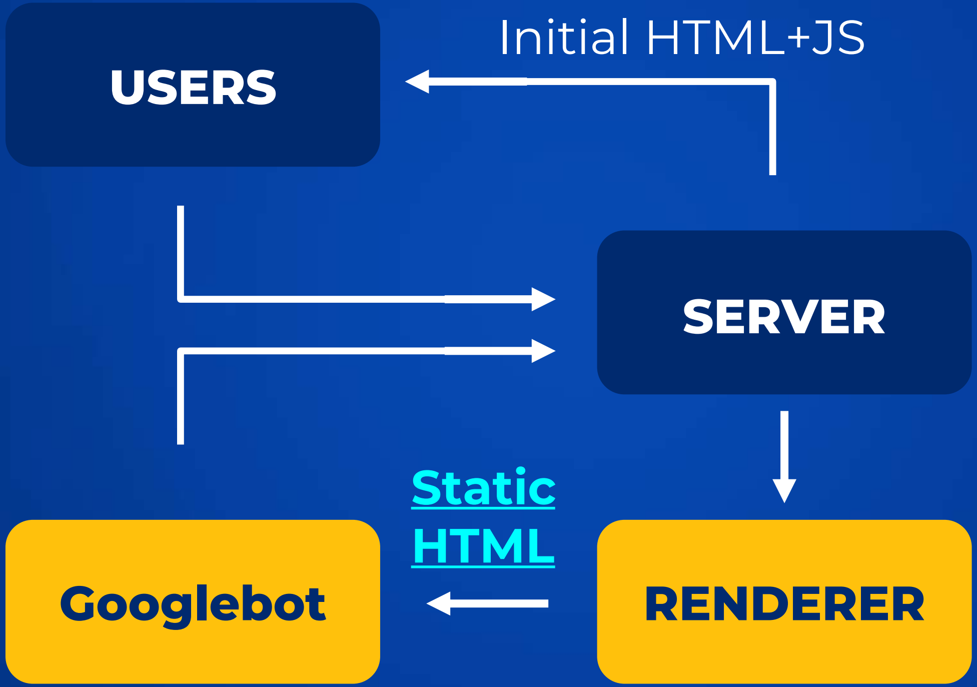
	Example	Recommended by Google
Dynamic rendering	YouTube	👌
Hybrid rendering *(also called "universal JS" or "isomorphic JS")*	Airbnb	👌

First option: Use dynamic rendering

↓

- Serving an **interactive** version for users

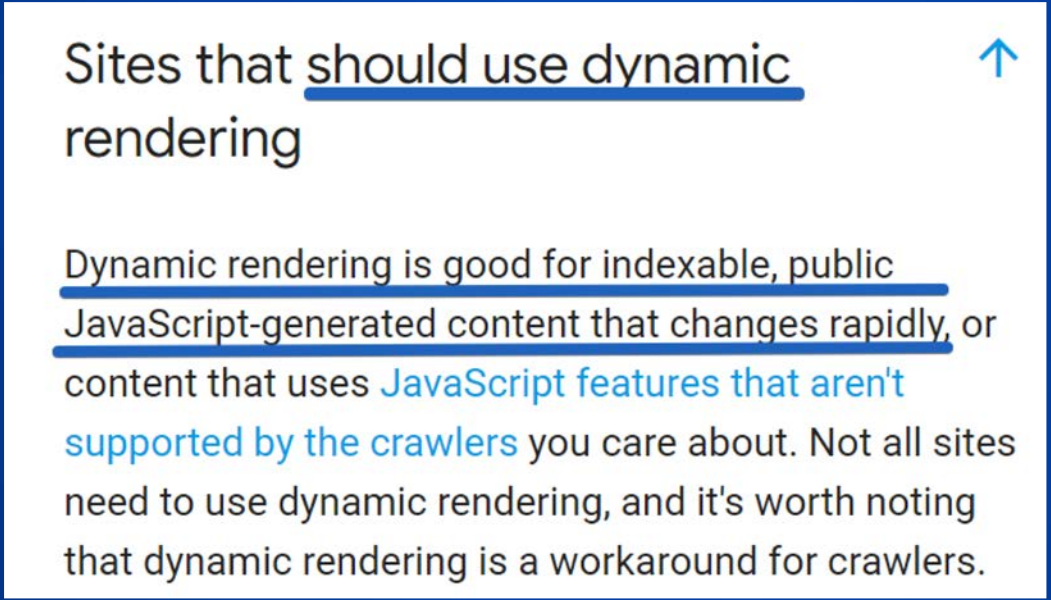
BUT a static version for Googlebot



Google

First option:
Use dynamic rendering

Officially recommended by Google for rapidly changing websites



Sites that should use dynamic rendering ↑

Dynamic rendering is good for indexable, public JavaScript-generated content that changes rapidly, or content that uses JavaScript features that aren't supported by the crawlers you care about. Not all sites need to use dynamic rendering, and it's worth noting that dynamic rendering is a workaround for crawlers.

Most popular dynamic rendering solutions

Renderton → Free

Most popular dynamic rendering solutions

Renderton → Free

Puppeteer → Free

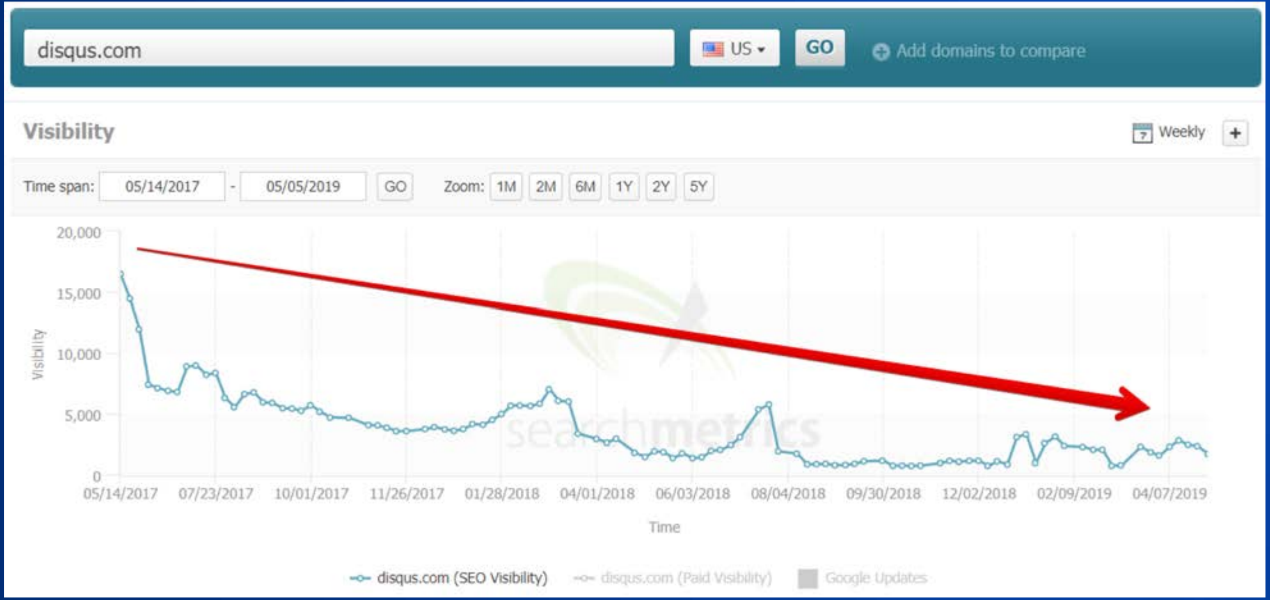
Most popular dynamic rendering solutions

Renderton	→	Free
Puppeteer	→	Free
Prerender.io	→	Service/Free

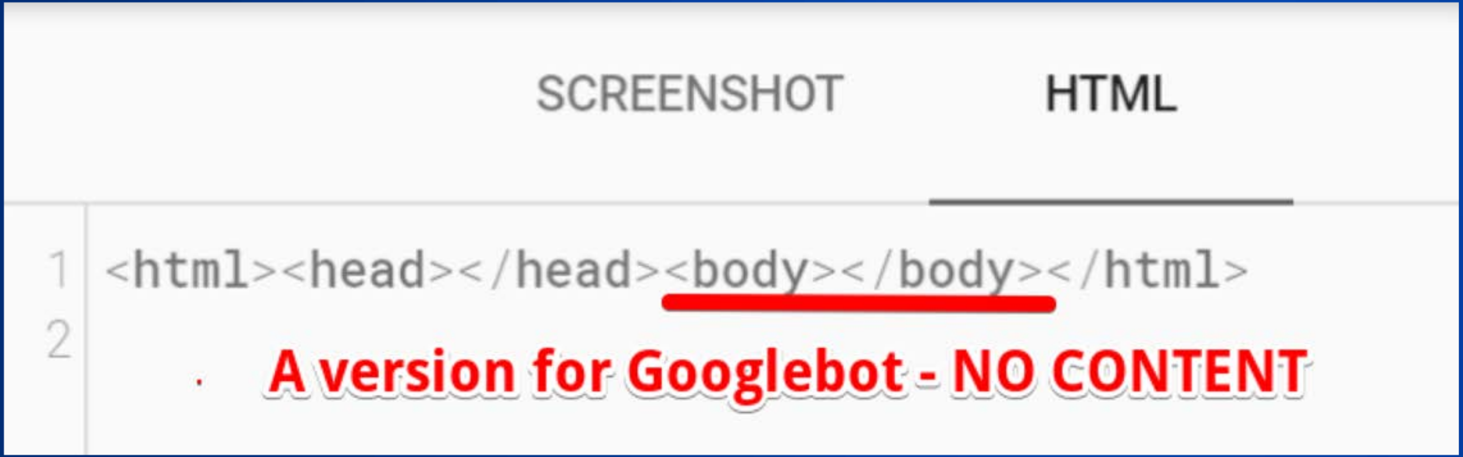
But dynamic rendering is not a silver bullet

ONELY

Disqus.com



What went wrong?

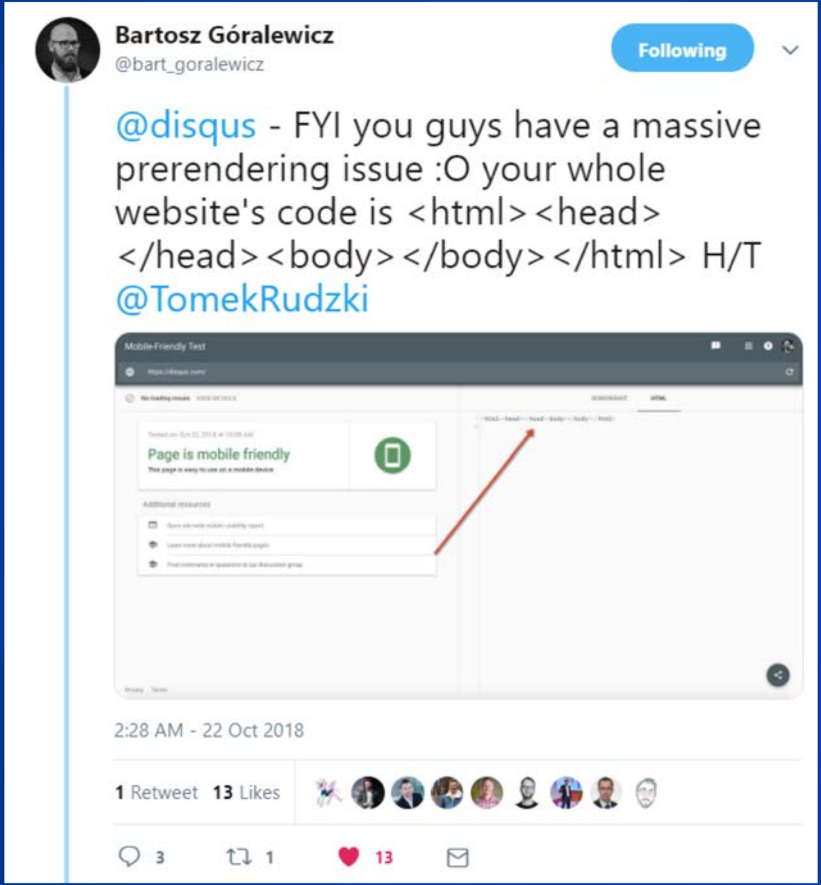


```
<html><head></head><body></body></html>
```

A version for Googlebot - NO CONTENT

We informed Disqus

about the issue



Bartosz Góralewicz
@bart_goralewicz

@disqus - FYI you guys have a massive prerendering issue :O your whole website's code is <html><head></head><body></body></html> H/T @TomekRudzki

2:28 AM - 22 Oct 2018

1 Retweet 13 Likes

ONELY

Second option:

Hybrid rendering

How it works

Initial, server-side rendered HTML is sent to users and search engines.
Then JavaScript is loaded on top of that.

Which brands use **Hybrid rendering?**

NETFLIX

MARVEL

STAPLES

NIKE

hulu

Expedia

Argos

cars.com
Confidence Comes Standard.

Booking.com

If you use **...try** NEXT.JS

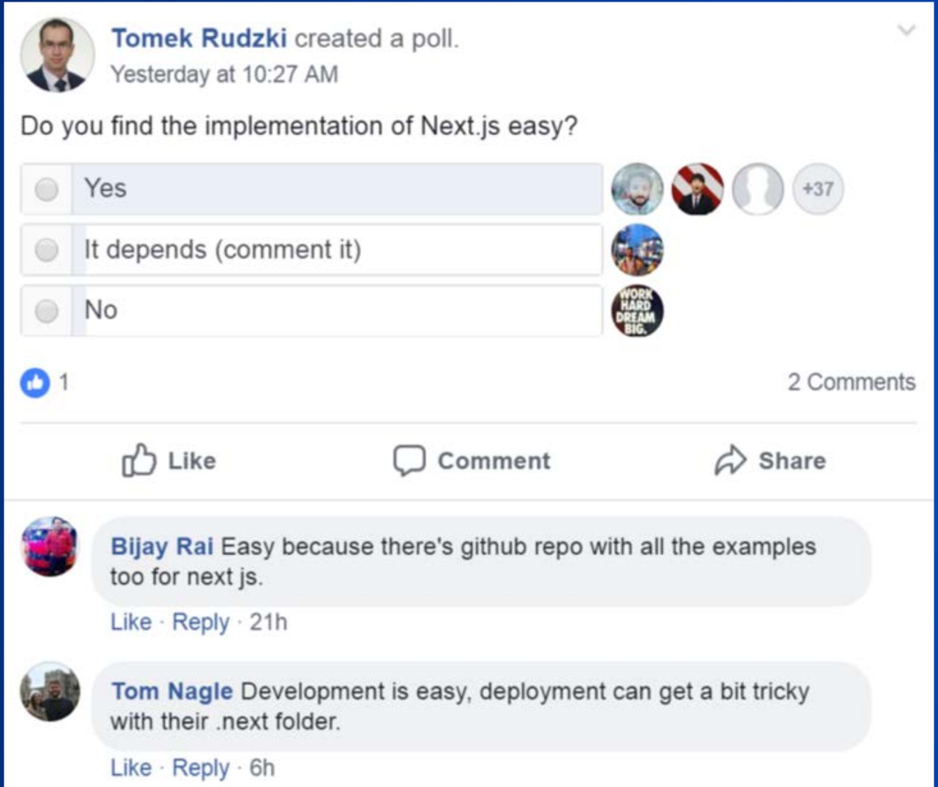
→ **for hybrid rendering**

Next.js is the next...

NEXT.JS

BIG thing

ONELY



Tomek Rudzki created a poll.
Yesterday at 10:27 AM

Do you find the implementation of Next.js easy?

○ Yes +37

○ It depends (comment it)

○ No

1 · 2 Comments

Bijay Rai Easy because there's github repo with all the examples too for next js.

Like · Reply · 21h

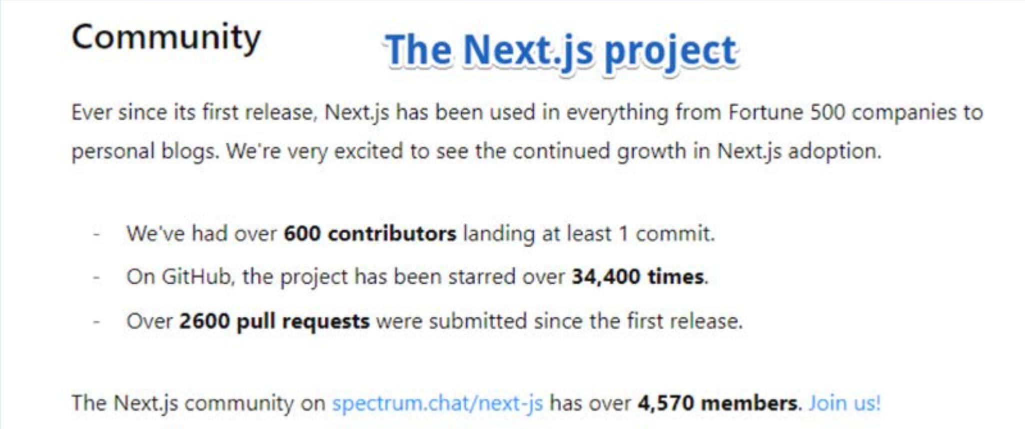
Tom Nagle Development is easy, deployment can get a bit tricky with their .next folder.

Like · Reply · 6h

The State of JS 2018 Survey:

35% of developers heard of Next.js and want to learn it.

It's actively maintained



Community

The Next.js project

Ever since its first release, Next.js has been used in everything from Fortune 500 companies to personal blogs. We're very excited to see the continued growth in Next.js adoption.

- We've had over **600 contributors** landing at least 1 commit.
- On GitHub, the project has been starred over **34,400 times**.
- Over **2600 pull requests** were submitted since the first release.

The Next.js community on spectrum.chat/next-js has over **4,570 members**. Join us!

Friends of Next.js

Vue.js

Angular

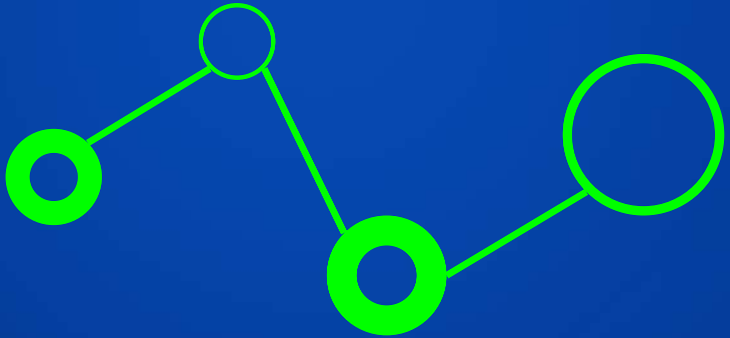
So many choices...

Relatively static website

You can consider Client-side rendering

Dynamic website

- Hybrid rendering, or
- Dynamic rendering



It’s not only about Google!

Other search engines struggle with JavaScript.

Facebook, Twitter

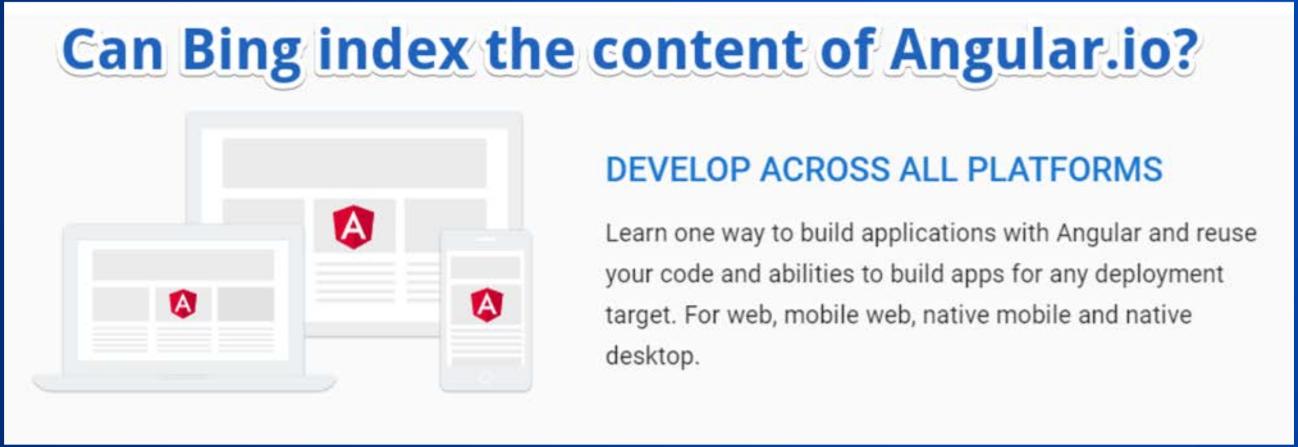
THE SAME!

Technically, Bing can render JavaScript.

But struggles with rendering JavaScript at scale

ONELY

Bing struggles with rendering JavaScript at scale

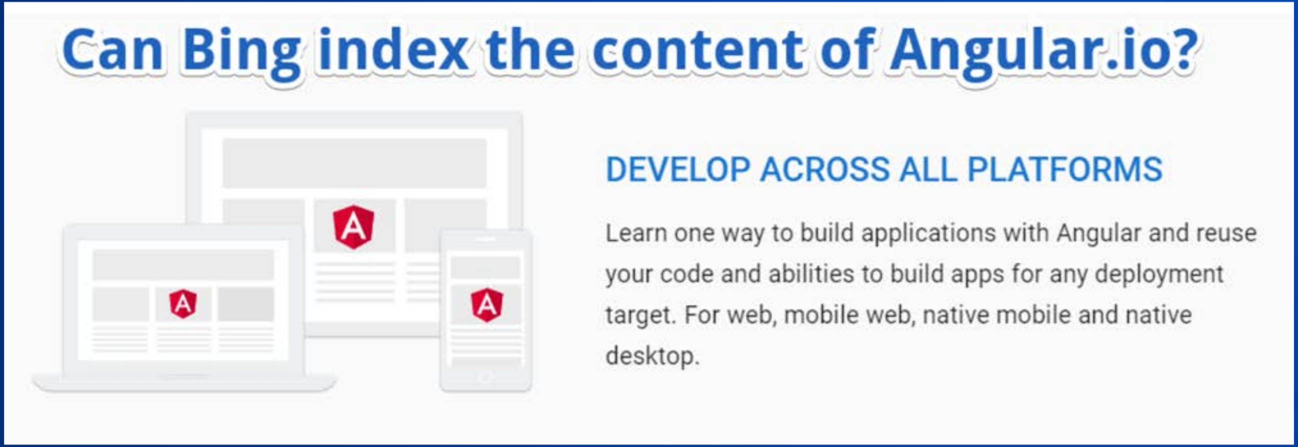


Can Bing index the content of Angular.io?

DEVELOP ACROSS ALL PLATFORMS

Learn one way to build applications with Angular and reuse your code and abilities to build apps for any deployment target. For web, mobile web, native mobile and native desktop.

Bing struggles with rendering JavaScript at scale



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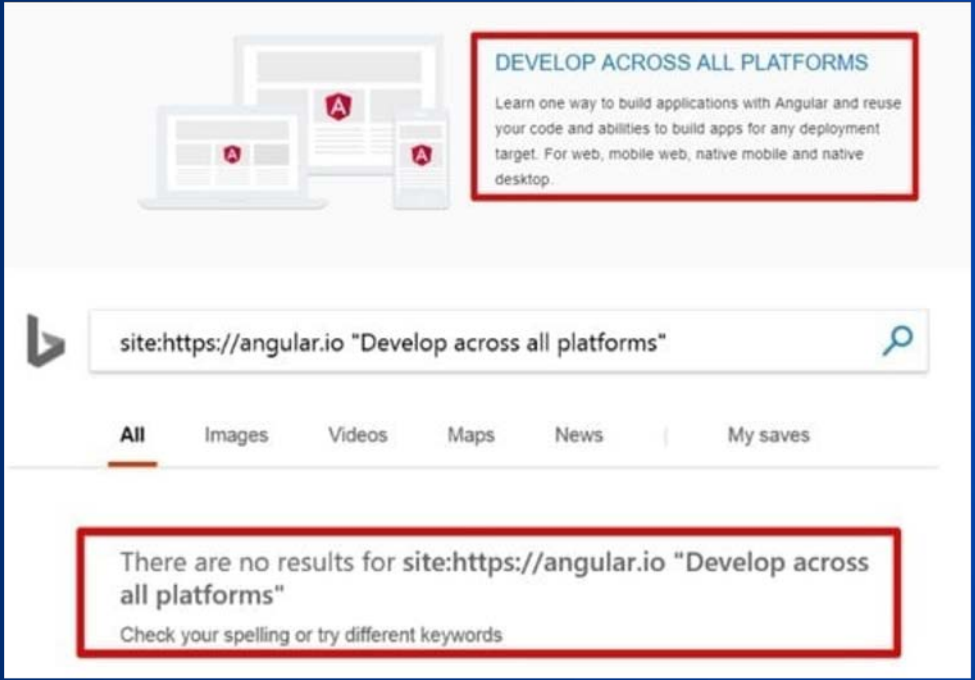


DEVELOP ACROSS ALL PLATFORMS

Learn one way to build applications with Angular and reuse your code and abilities to build apps for any deployment target. For web, mobile web, native mobile and native desktop.

site:https://angular.io "Develop across all platforms"

There are no results for **site:https://angular.io "Develop across all platforms"**

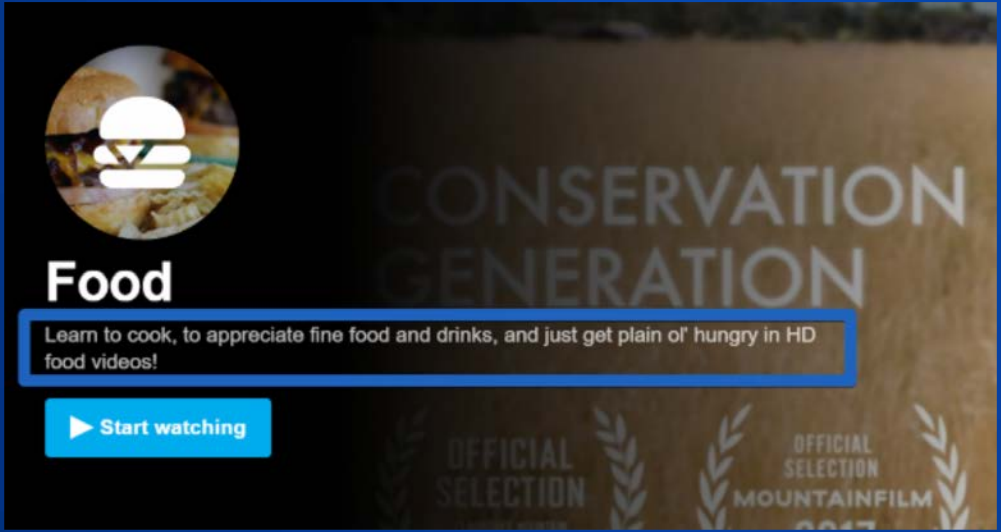
Check your spelling or try different keywords

Can Bing index the content of Angular.io?

No!

Bing struggles with rendering JavaScript at scale

Can Bing index the content of Vimeo?

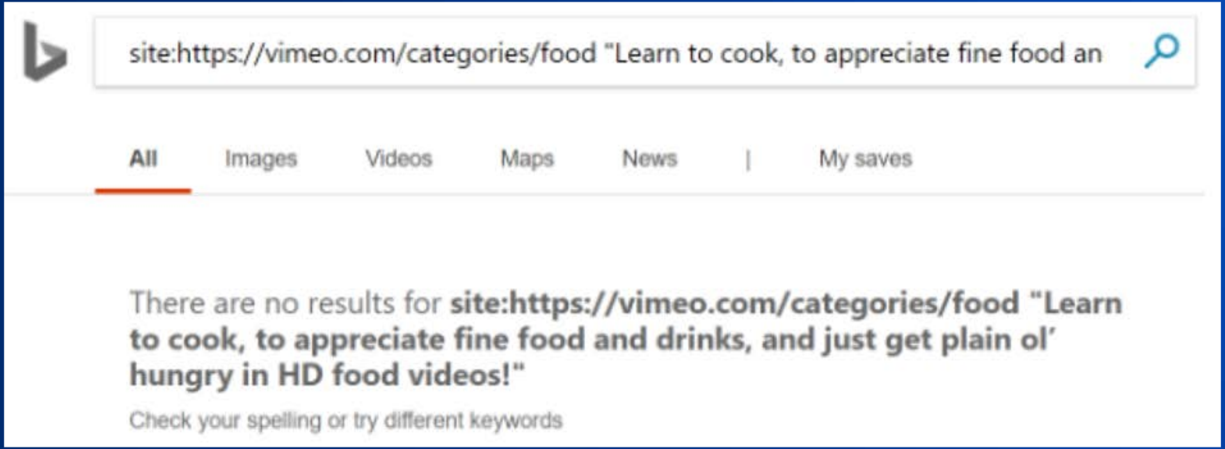


Food

Learn to cook, to appreciate fine food and drinks, and just get plain ol' hungry in HD food videos!

ONELY

Can Bing index the content of Vimeo?



site:https://vimeo.com/categories/food "Learn to cook, to appreciate fine food an

There are no results for **site:https://vimeo.com/categories/food "Learn to cook, to appreciate fine food and drinks, and just get plain ol' hungry in HD food videos!"**

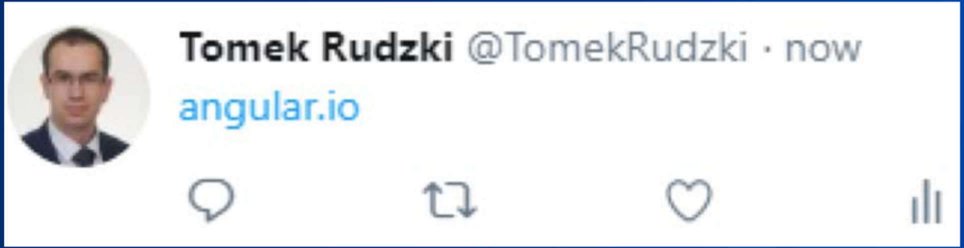
Check your spelling or try different keywords

No!

Let’s talk about... Twitter

ONELY

Angular.io is doing fine on Twitter



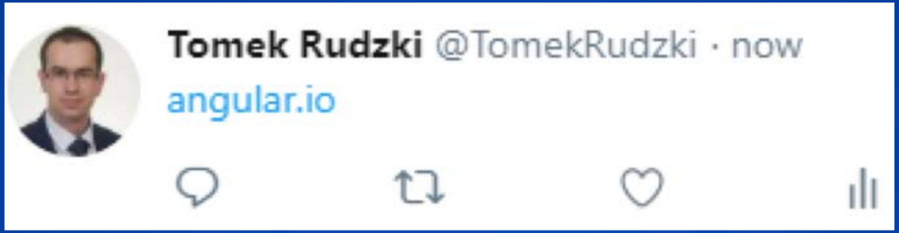
Tomek Rudzki @TomekRudzki · now

angular.io

Really?

ONELY

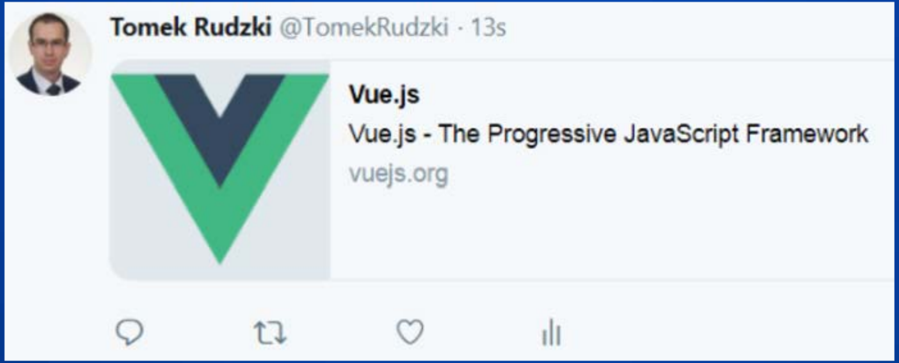
Angular.io is **NOT** doing fine on Twitter



Tomek Rudzki @TomekRudzki · now

angular.io

Vue.js is doing **MUCH** better.



Tomek Rudzki @TomekRudzki · 13s

Vue.js

Vue.js - The Progressive JavaScript Framework

vuejs.org

Key takeaways

- It's the ~~HTML~~ **JS** Era (lucky you!)
- Rendering delays are still a problem
- Even after Chromium update, **Google still doesn't support many modern JavaScript features** (i.e. no service workers, no geolocation API)
- You should always ensure that **Google can render and index your content** (choose a sample of pages)

Worth reading

- **Ultimate Guide to JavaScript SEO**
  https://www.onely.com/blog/ultimate-guide-javascript-seo/
- **How to Diagnose and Solve JavaScript SEO Issues in 6 Steps by Tomek Rudzki** https://moz.com/blog/diagnose-and-solve-javascript-seo-issues
- **How to prepare for a JS migration by Maria Cieślak**
  https://searchengineland.com/how-to-prepare-for-a-js-migration-308795

ONELY

Thank you, everyone!

@TomekRudzki

in /tomasz-rudzki