Render v Rank

•••

SEO for ~~JavaScript~~ Everyone

Optimisey, Cambridge SEO MeetUp | @jammer_volts

The Foundations

Websites are made of **code**.

Code is written in **languages**.

3 languages are the **foundation** of websites.

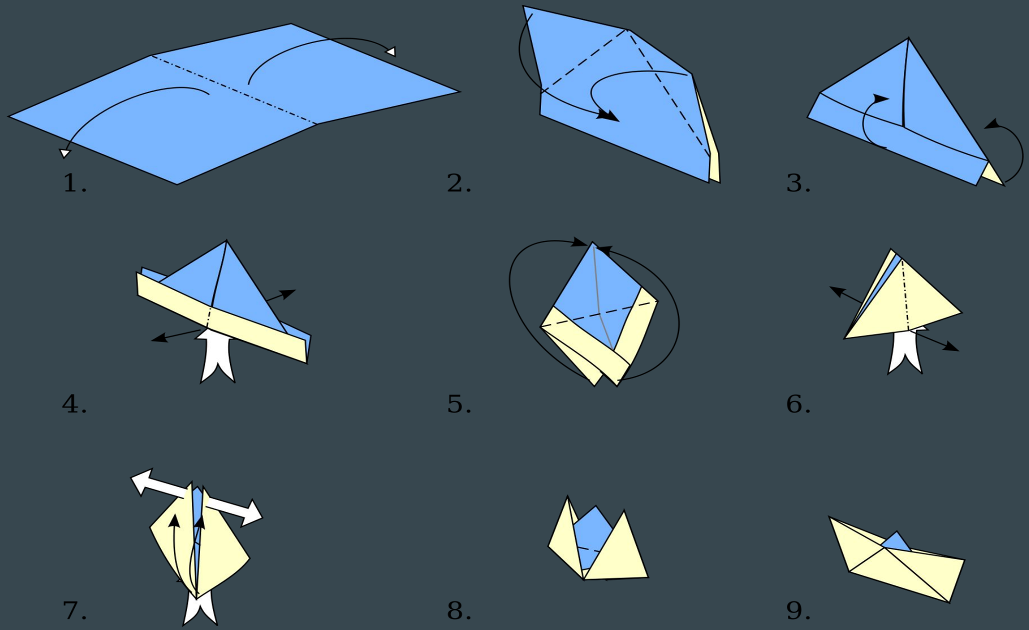
HTML = content

CSS = layout, design, & visual effects

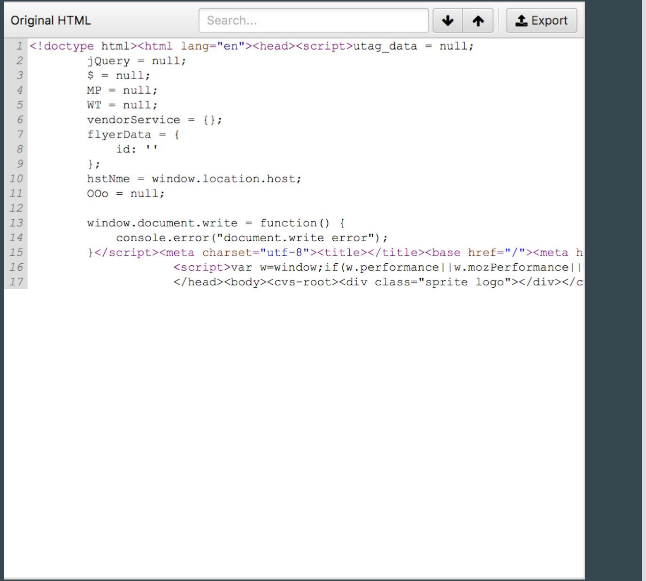
JavaScript = web version of programming code

JavaScript executes in the browser to build rendered content.

1. Load
2. Parse
3. Compile
4. Execute



JS can transform a few lines of code into a webpage



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                    </head><body><cvs-root><div class="sprite logo"></div></c
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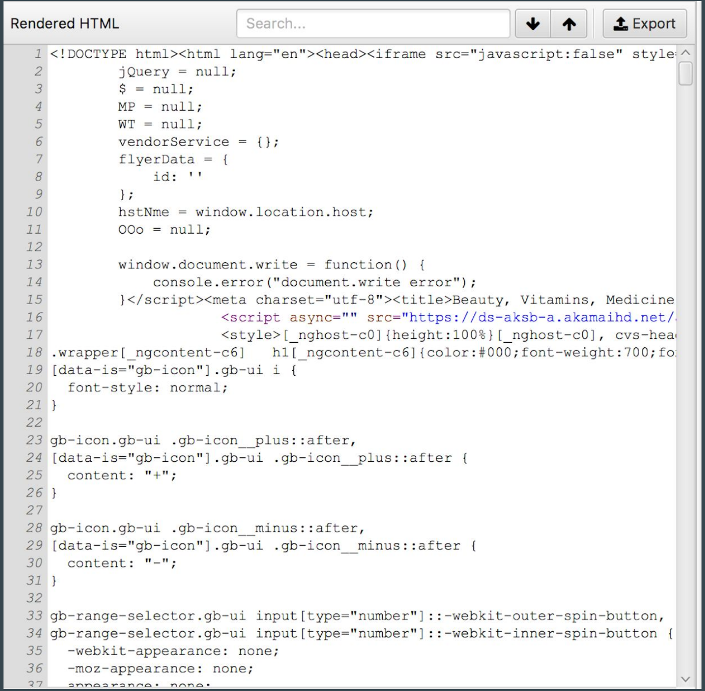

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                    <script async="" src="https://ds-aksb-a.akamaihd.net/
                    <style>[_nghost-c0]{height:100%}[_nghost-c0], cvs-hea
.wrapper[_ngcontent-c6]   h1[_ngcontent-c6]{color:#000;font-weight:700;fo
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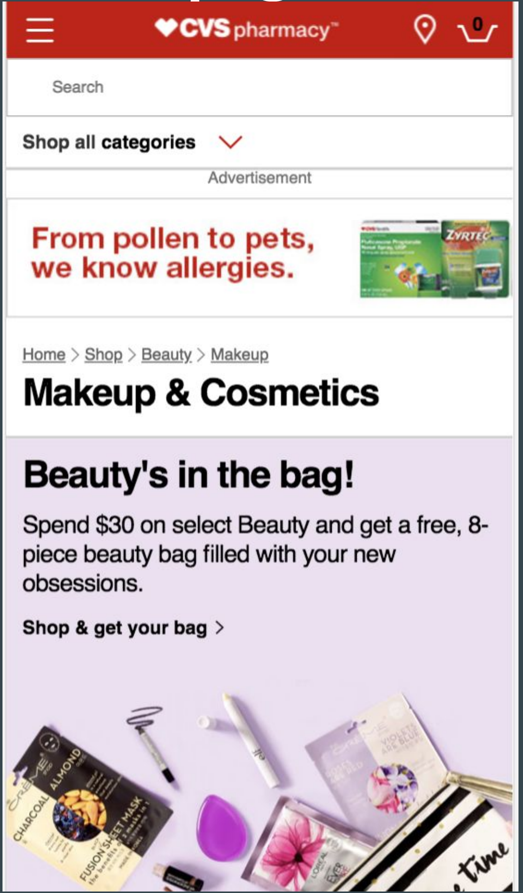


Shop all categories

From pollen to pets, we know allergies.

Home > Shop > Beauty > Makeup

Makeup & Cosmetics

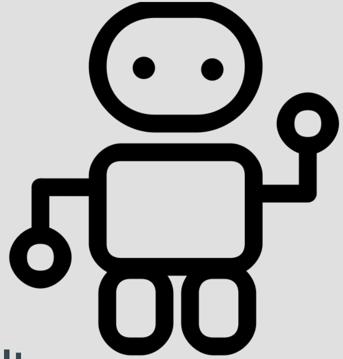
Beauty's in the bag!

Spend $30 on select Beauty and get a free, 8-piece beauty bag filled with your new obsessions.

Shop & get your bag >

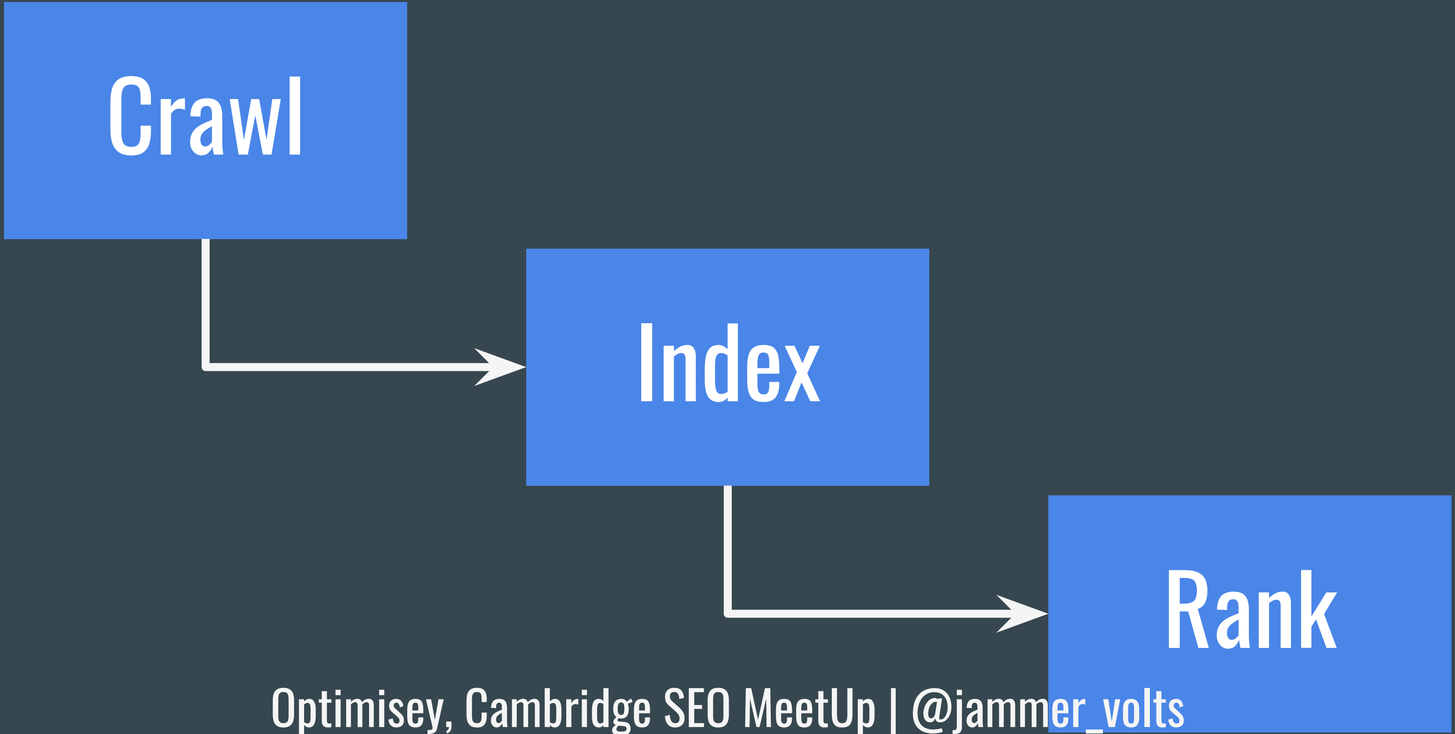
Googlebot is **code**.
Code obeys **rules**.
Googlebot runs scripts in a set **order**.

We call this **crawling**.



Created by Moose Icons
from Noun Project

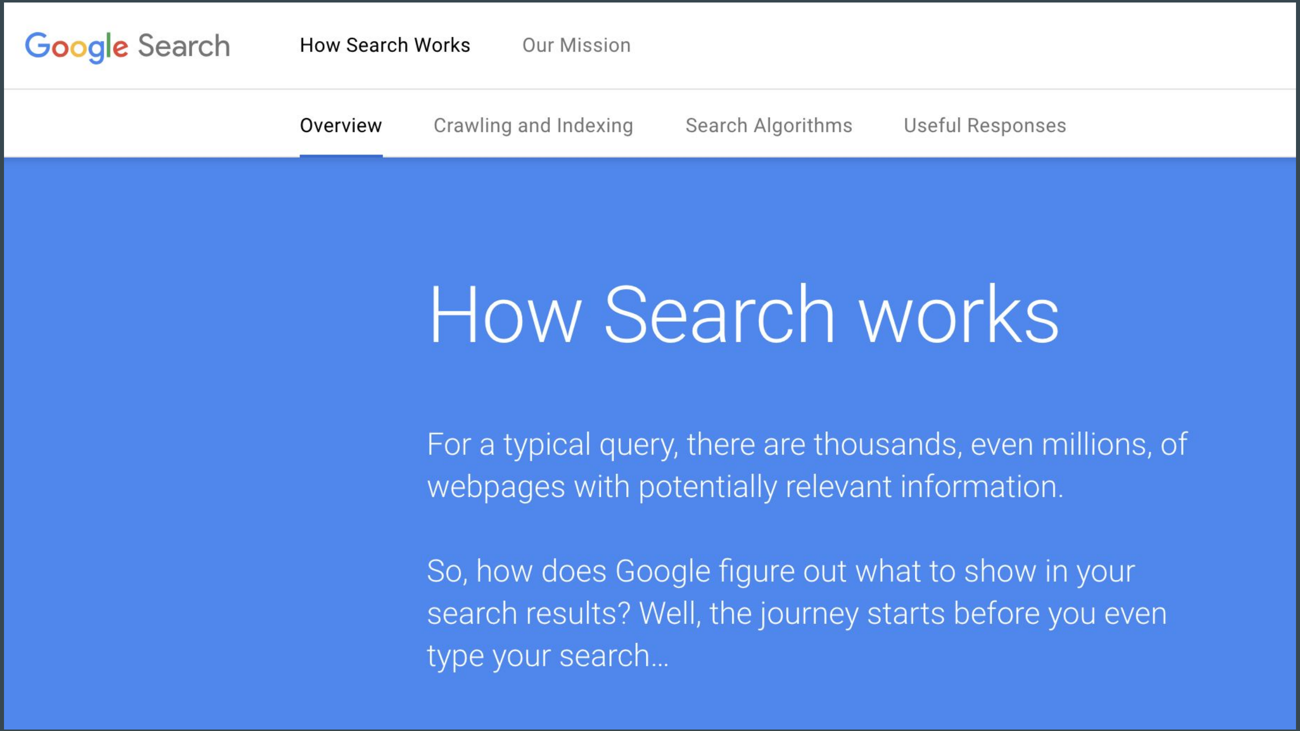
Until 10 May 2018, we thought Googlebot worked like this



Crawl

Index

Rank

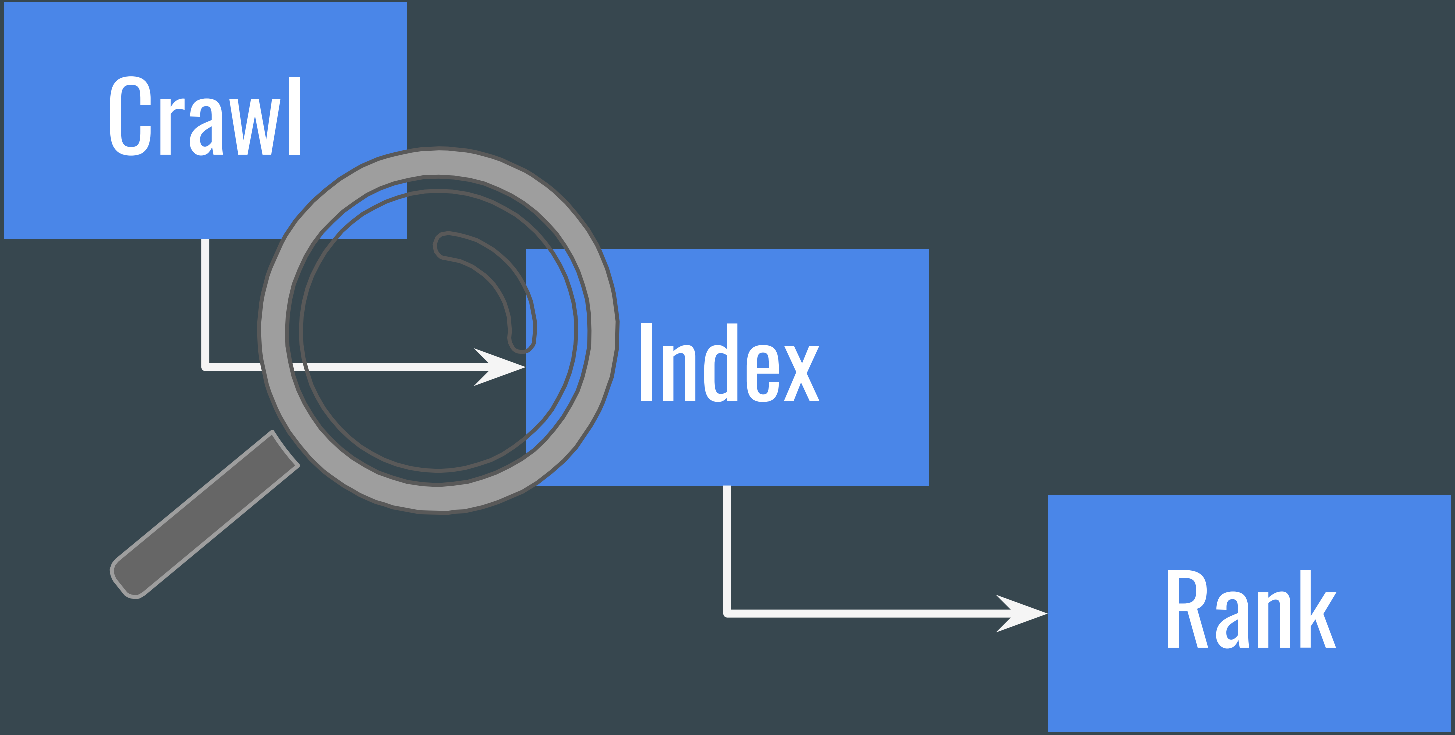


How Search works

For a typical query, there are thousands, even millions, of webpages with potentially relevant information.

So, how does Google figure out what to show in your search results? Well, the journey starts before you even type your search...

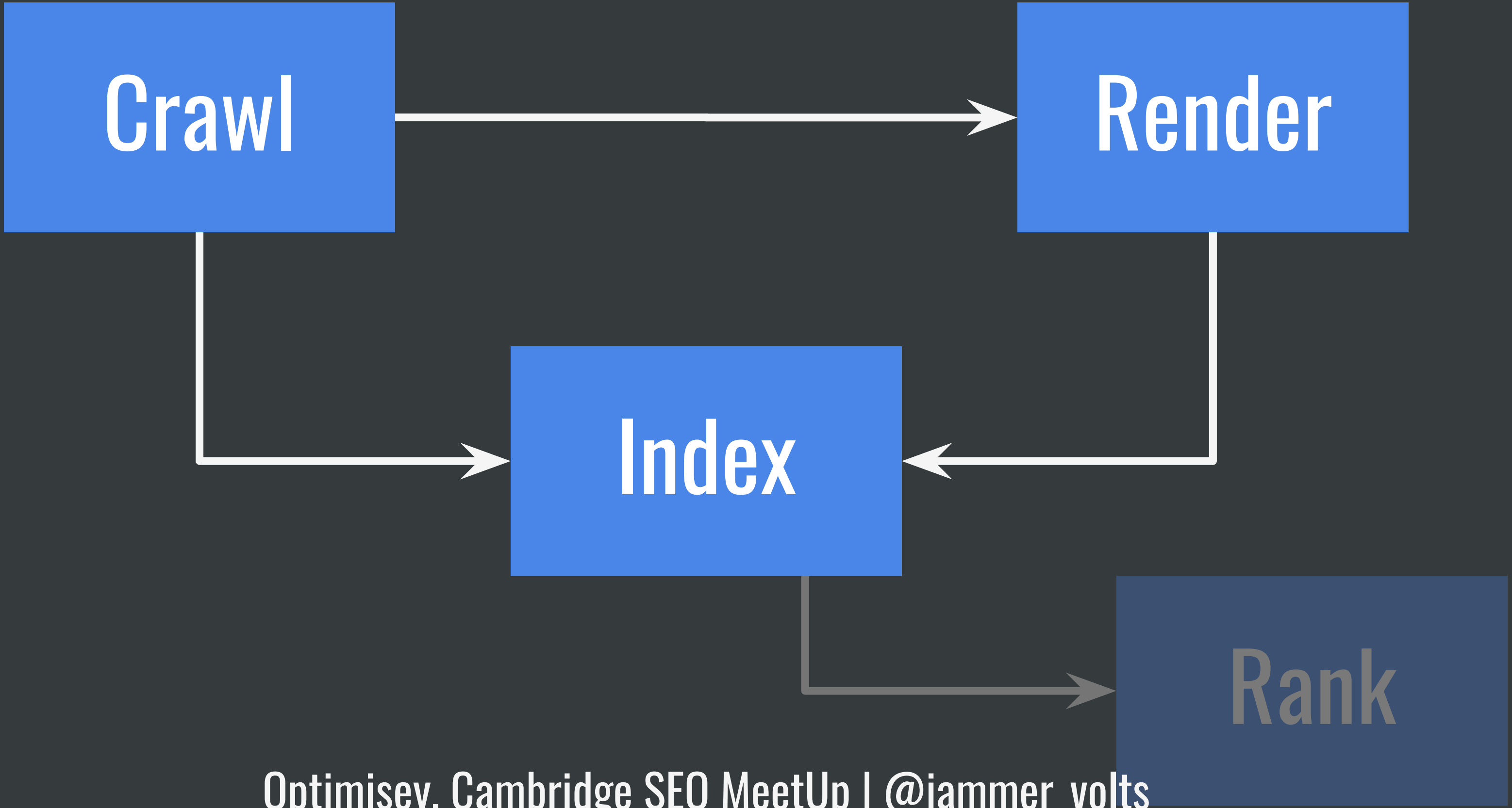
Spot the 3 hidden assumptions



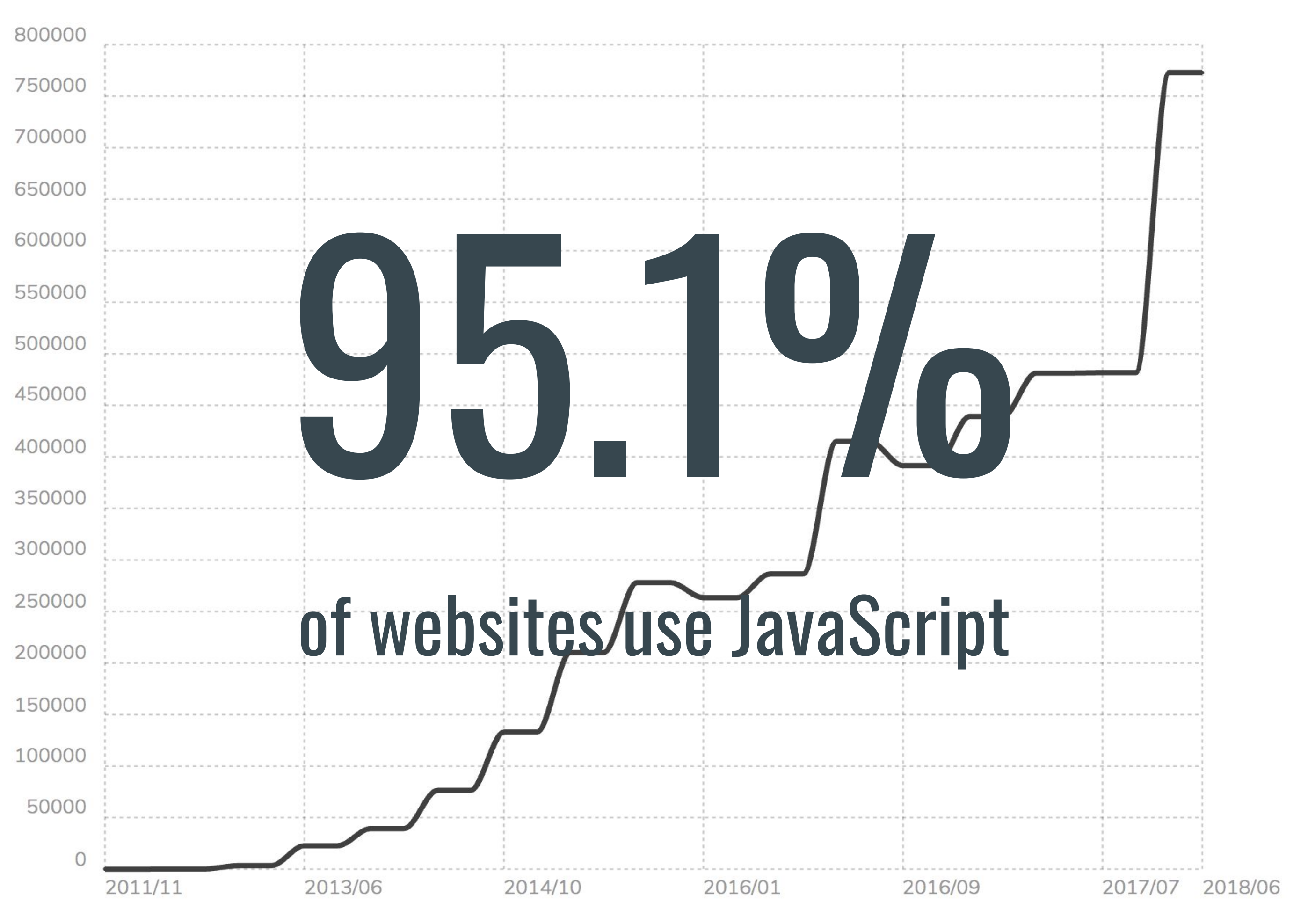
This model assumes:

1. Googlebot renders JS as it crawls.
2. Indexing is based on DOM content.
3. These actions occur simultaneously in a single sequence.

Googlebot is magic and does all the things instantly!



EXPECTATION
Coca-Cola
REALITY



95.1%

of websites use JavaScript

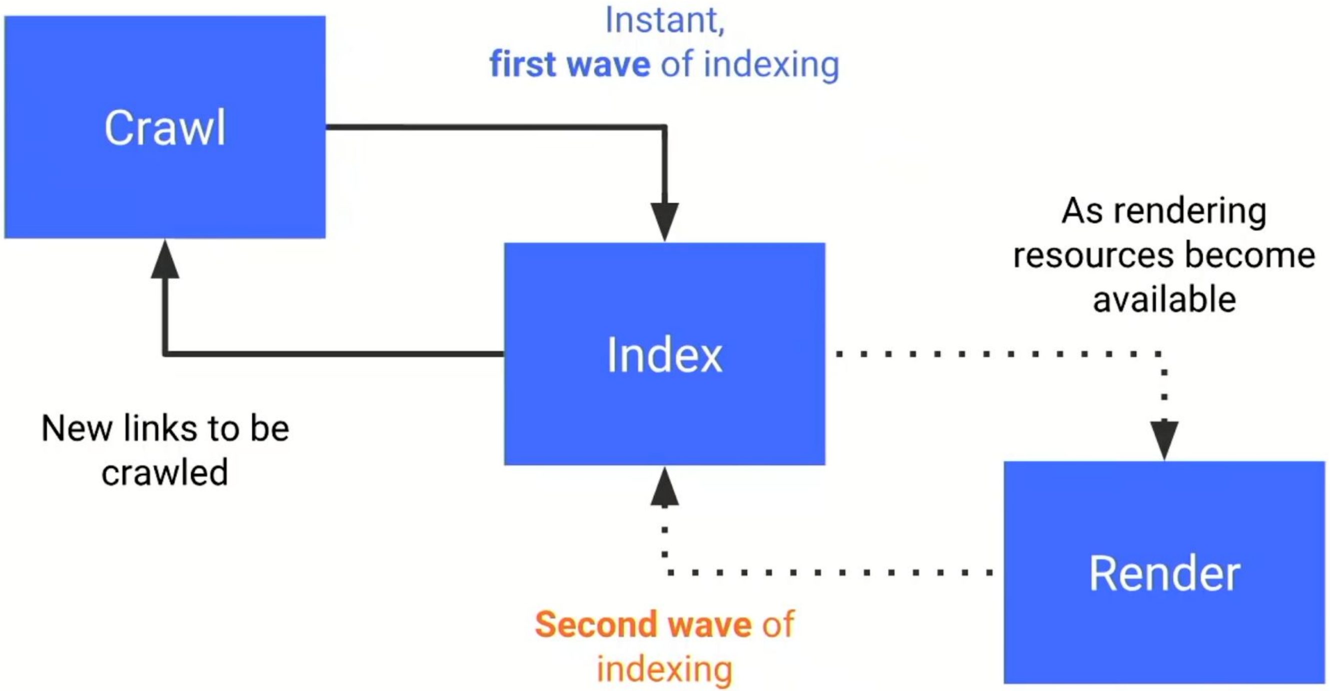
Source: W3 Usage of JavaScript for websites

160,000,000,000,000,000

pages on the web

JavaScript webpages
Googlebot resources

JavaScript generated content is discovered by Googlebot only once the resources become available.



Crawl

Instant,
first wave of indexing

Index

As rendering
resources become
available

New links to be
crawled

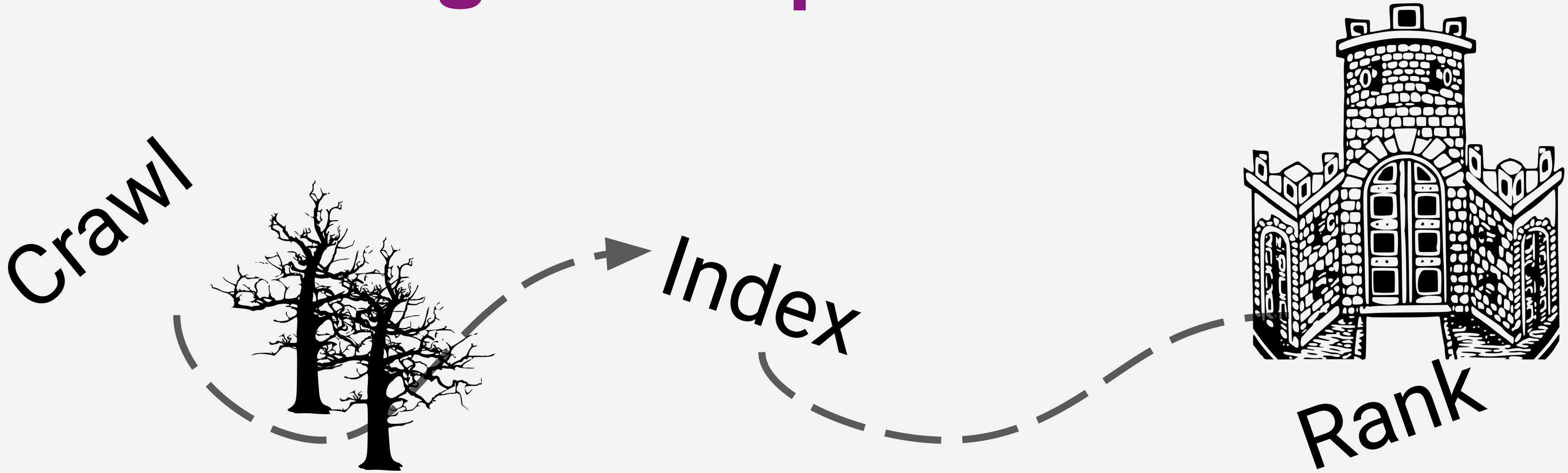
Render

Second wave of
indexing

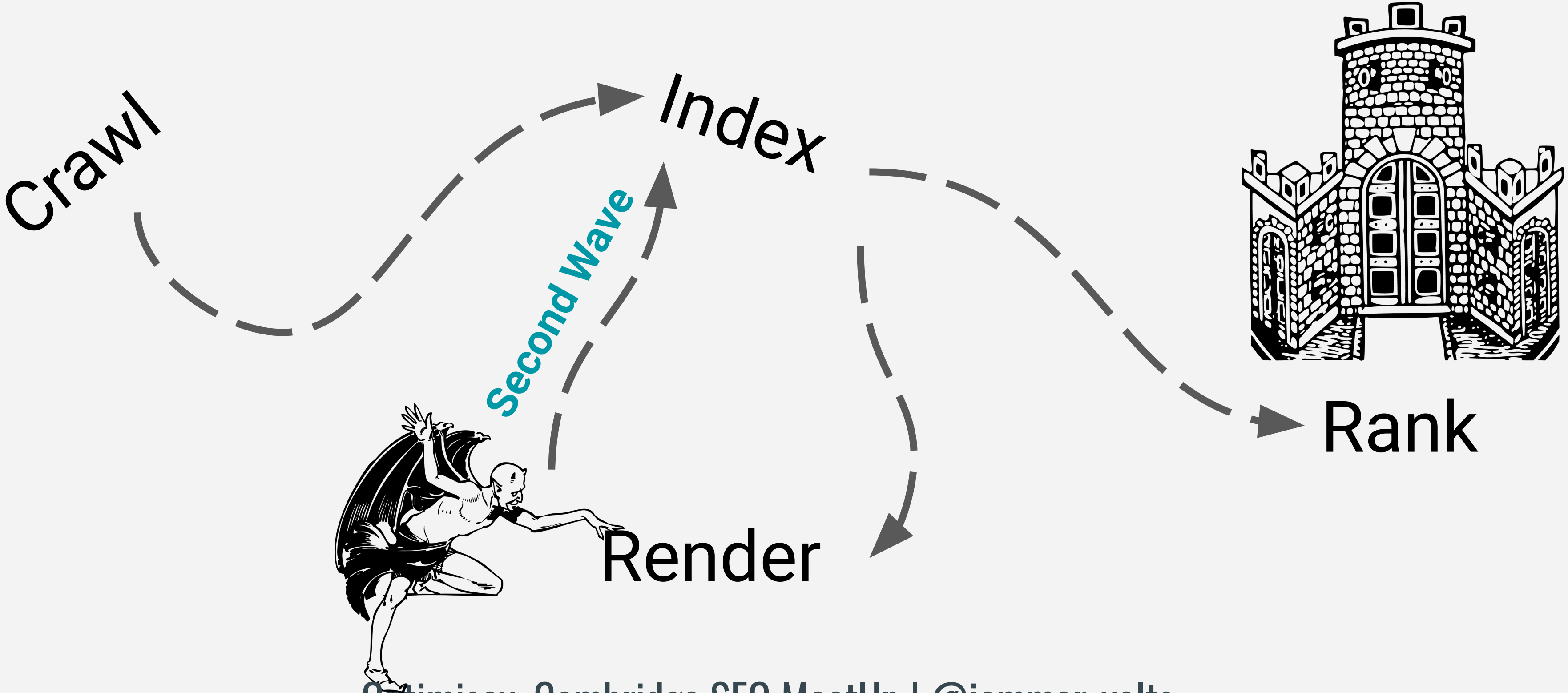
#io18

Source: Google i/o 2018

This changes our quest

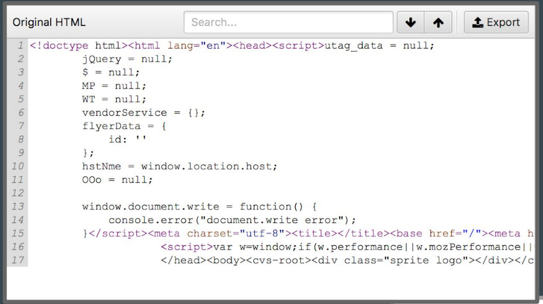


Now, we know that **Rendering** is part of the process and that Google has **two waves** of indexing.



What is Rendering?

When Googlebot retrieves your pages, Googlebot runs your code, and assess your content to understand the layout or structure of your site.



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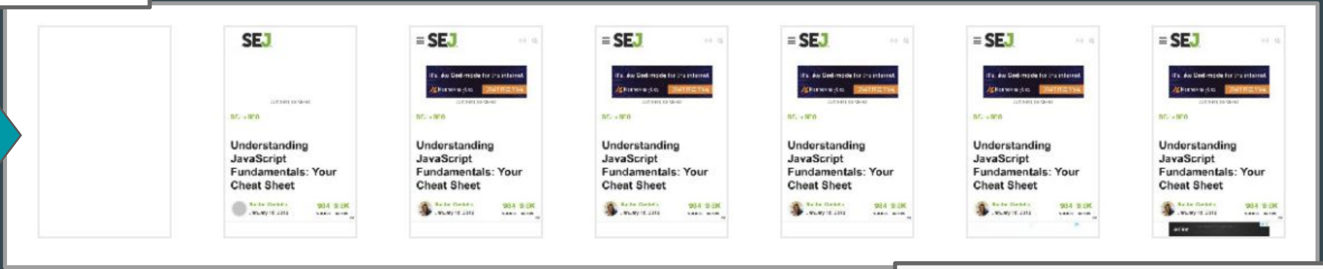
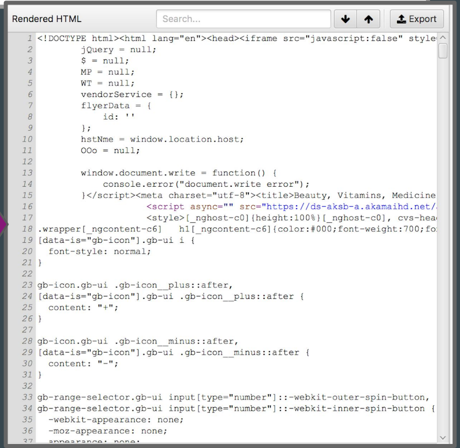
```

Initial HTML
(1st wave of indexing)

Rendering



Rendered HTML
(2nd Wave of indexing)



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```

Render’s Role in Rank

All information Google collects during the rendering process is then used to rank the quality and value of your site content against other sites and what people are searching for with Google Search.

How Google Search Works, Search Console Help Center

Rendering Risks

If Google cannot render the pages on your site, it becomes more difficult to understand your web content because we are missing key visual layout information about your web pages.

As a result, the visibility of your site content in Google Search can suffer.

WRS, web rendering service

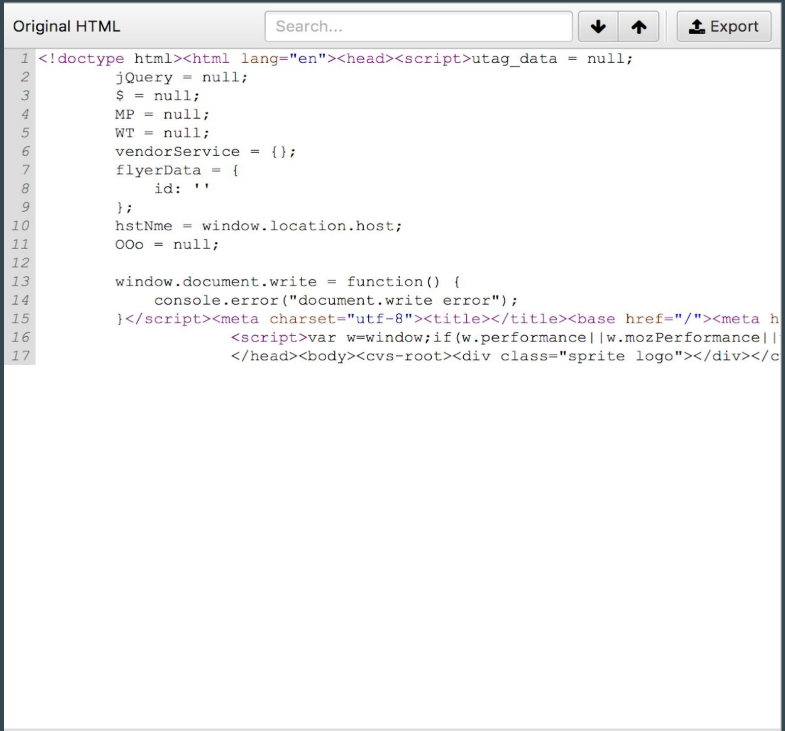
Googlebot queues pages for both crawling and rendering. It is not immediately obvious when a page is waiting for crawling and when it is waiting for rendering.

WRS is the name used to represent the collective elements involved in Google’s rendering service. Many details are not publically available.

How Googlebot Renders

1. A URL is pulled from the crawl queue
2. Googlebot requests the URL and downloads the initial HTML

Use **View Page Source** to see the initial HTML



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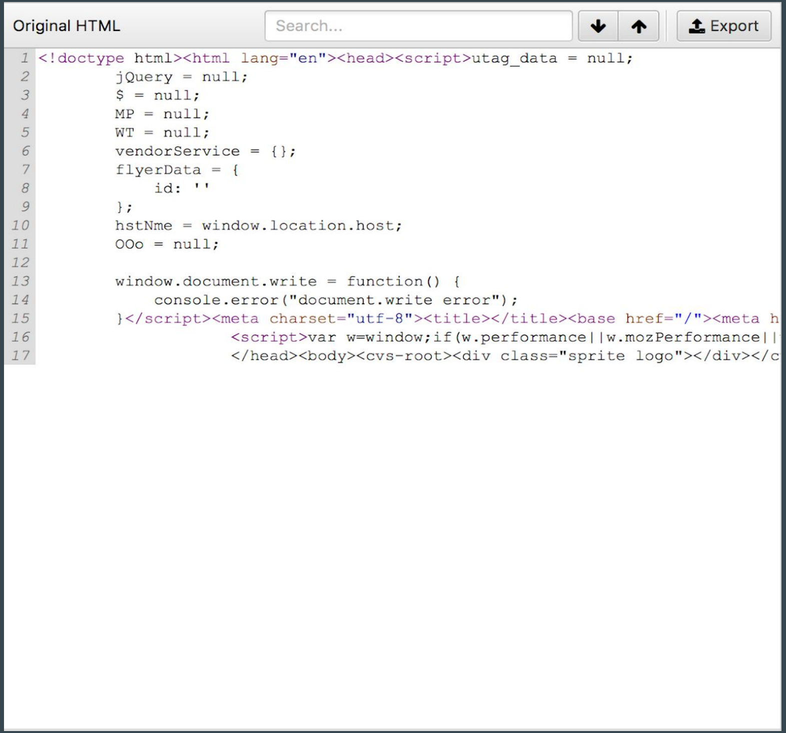
                    </head><body><cvs-root><div class="sprite logo"></div></c
```

How Googlebot Renders

3. The Initial HTML is passed to the processing stage

This is the First Wave of Indexing



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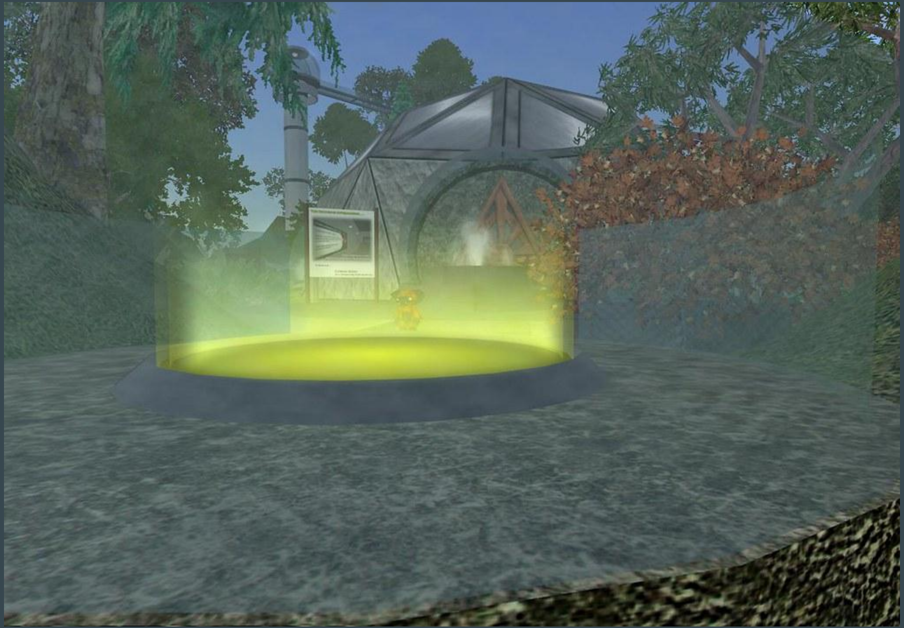
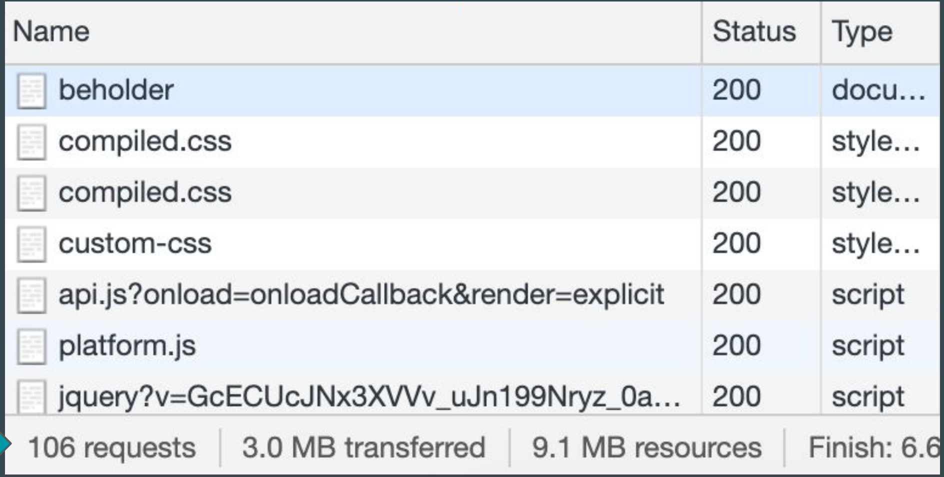


How Googlebot Renders

4. The processing stage extracts links from the initial HTML

5. Links go back on the crawl queue



Name	Status	Type
beholder	200	docu…
compiled.css	200	style…
compiled.css	200	style…
custom-css	200	style…
api.js?onload=onloadCallback&render=explicit	200	script
platform.js	200	script
jquery?v=GcECUcJNx3XVVv_uJn199Nryz_0a…	200	script

106 requests | 3.0 MB transferred | 9.1 MB resources | Finish: 6.6

Use **Network** tab to see how many resources a page calls

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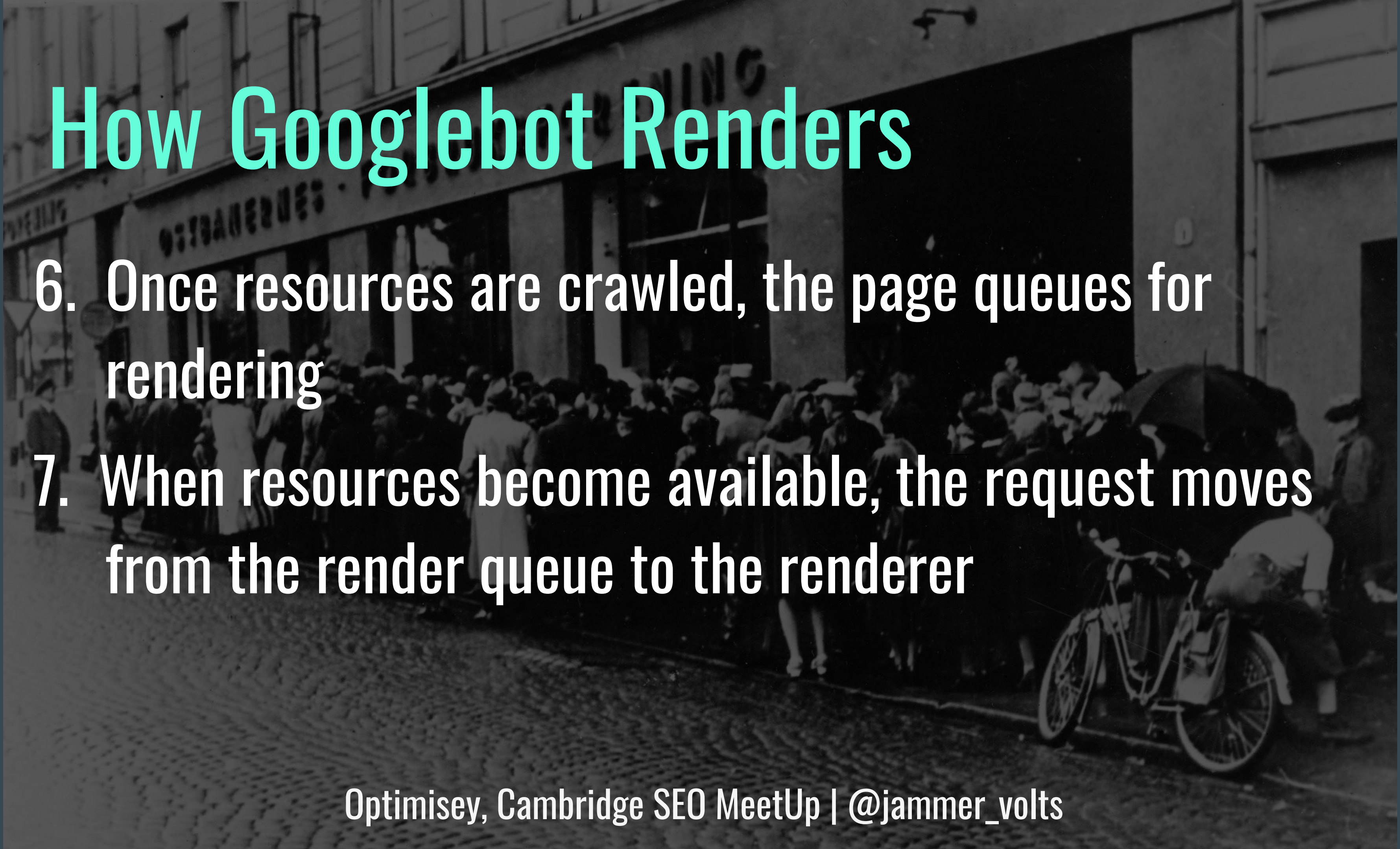
How Googlebot Renders

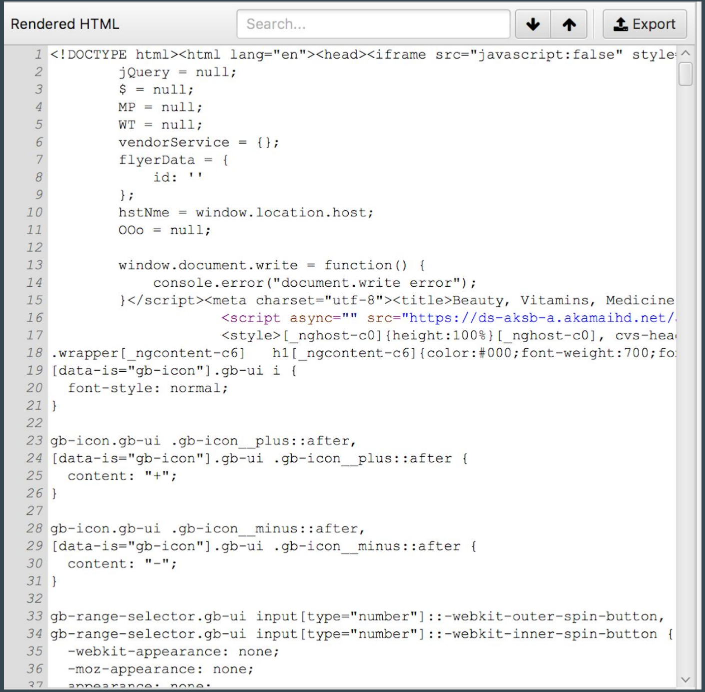


6. Once resources are crawled, the page queues for rendering
7. When resources become available, the request moves from the render queue to the renderer

How Googlebot Renders

8. Google assembles the page using the crawled links

Use **Inspect** to see rendered HTML



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  appearance: none;
```
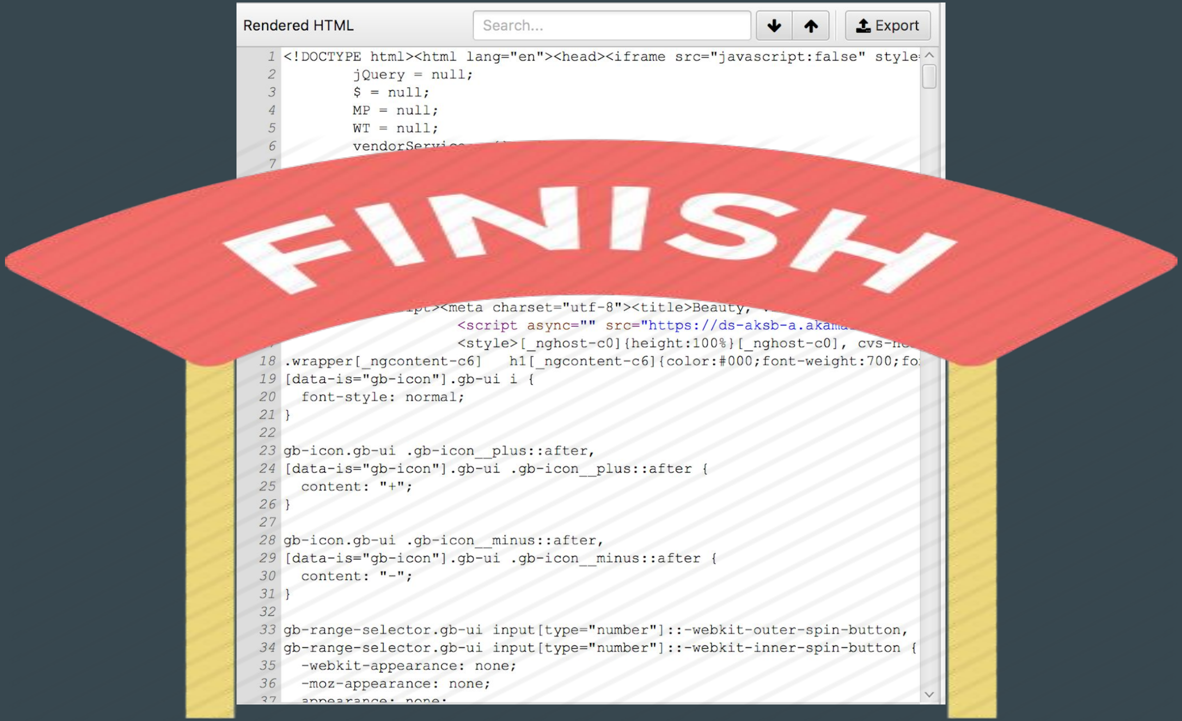

How Googlebot Renders

9. Renderer passes the rendered HTML back to processing
10. Processing indexes the content.

Second Wave of Indexing



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```

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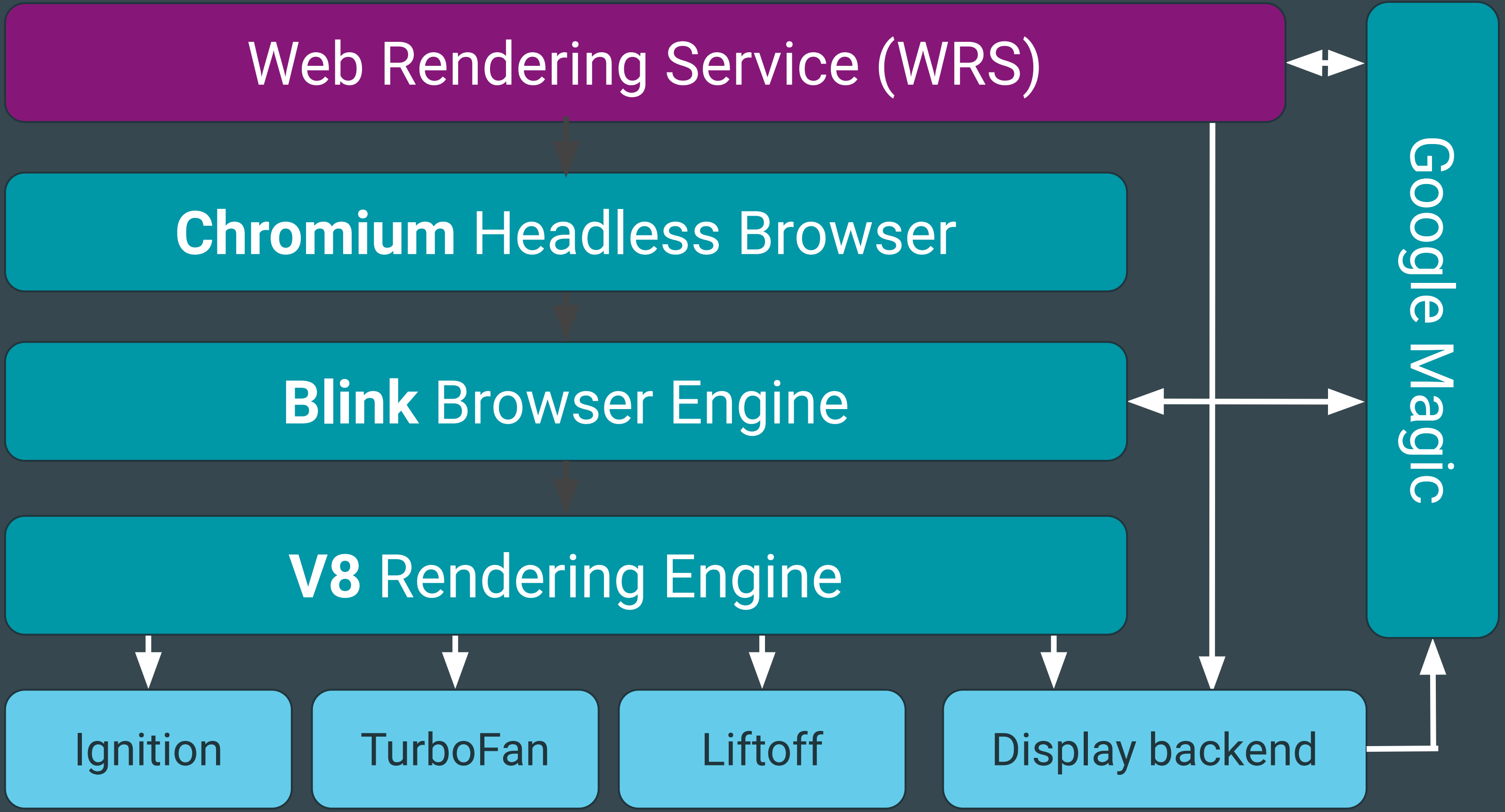
How Googlebot Renders

11. Extracts links from the rendered HTML to put them into the crawl queue.

Web Rendering Service Anatomy



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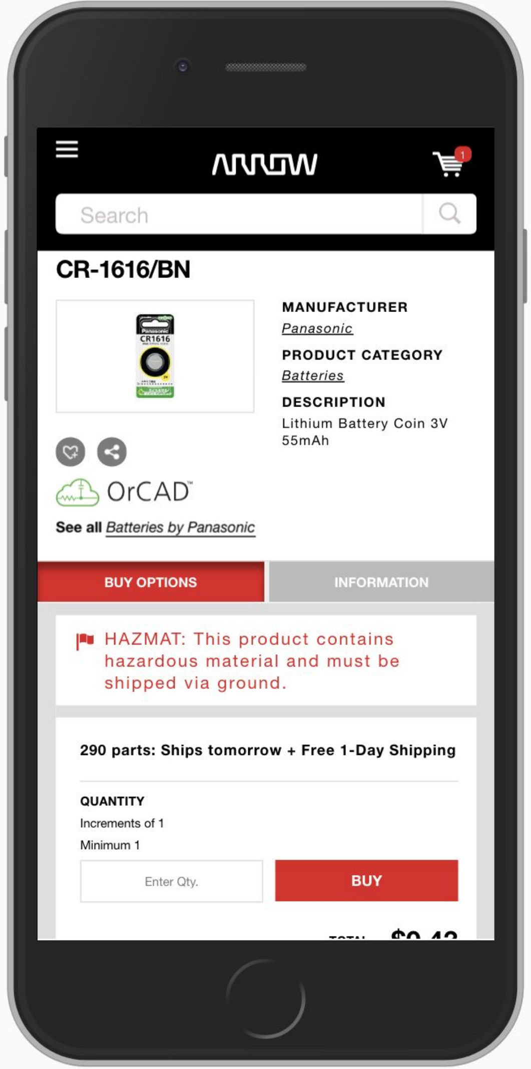
What should SEOs care about a little JavaScript?

Meet Arrow.com

- 5.2M products
- 7 languages
- 8 Asynchronous Javascript and XML (AJAX) calls per page



CR-1616/BN

MANUFACTURER
Panasonic

PRODUCT CATEGORY
Batteries

DESCRIPTION
Lithium Battery Coin 3V 55mAh

See all *Batteries by Panasonic*

HAZMAT: This product contains hazardous material and must be shipped via ground.

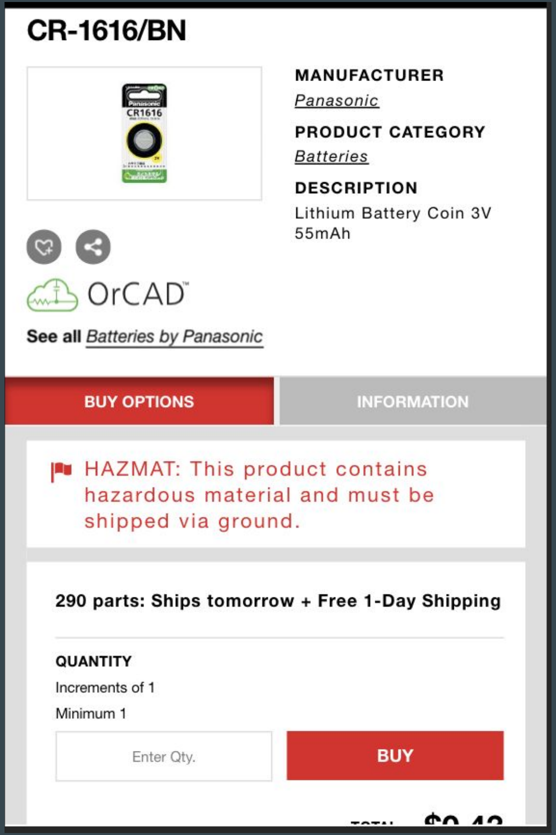
290 parts: Ships tomorrow + Free 1-Day Shipping

QUANTITY
Increments of 1
Minimum 1

TOTAL $0.42

Arrow minus AJAX

With JavaScript



CR-1616/BN

MANUFACTURER
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PRODUCT CATEGORY
Batteries

DESCRIPTION
Lithium Battery Coin 3V 55mAh

See all *Batteries by Panasonic*

BUY OPTIONS | INFORMATION

HAZMAT: This product contains hazardous material and must be shipped via ground.

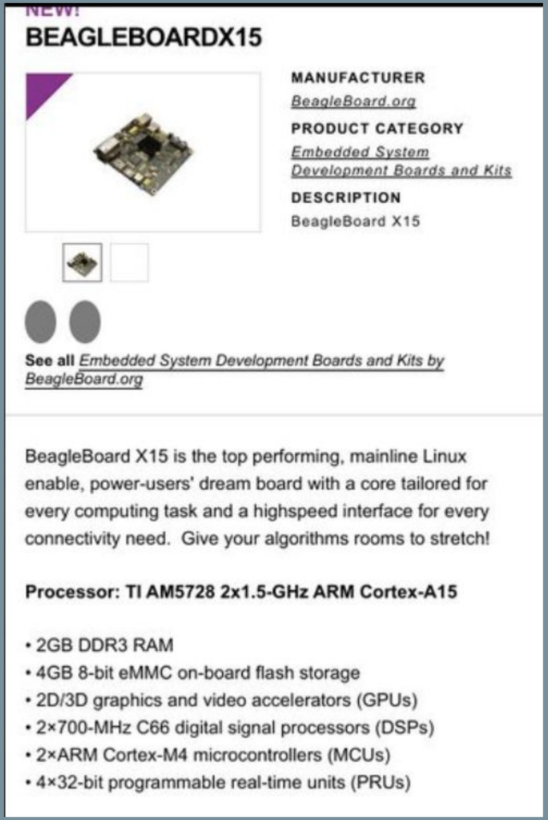
290 parts: Ships tomorrow + Free 1-Day Shipping

QUANTITY
Increments of 1
Minimum 1

Enter Qty. | BUY

TOTAL $0.43

Without JavaScript



NEW!

BEAGLEBOARDX15

MANUFACTURER
BeagleBoard.org

PRODUCT CATEGORY
Embedded System Development Boards and Kits

DESCRIPTION
BeagleBoard X15

See all *Embedded System Development Boards and Kits by BeagleBoard.org*

BeagleBoard X15 is the top performing, mainline Linux enable, power-users' dream board with a core tailored for every computing task and a highspeed interface for every connectivity need. Give your algorithms rooms to stretch!

Processor: TI AM5728 2x1.5-GHz ARM Cortex-A15

- 2GB DDR3 RAM
- 4GB 8-bit eMMC on-board flash storage
- 2D/3D graphics and video accelerators (GPUs)
- 2×700-MHz C66 digital signal processors (DSPs)
- 2×ARM Cortex-M4 microcontrollers (MCUs)
- 4×32-bit programmable real-time units (PRUs)

285 parts: Ships in 2 days + Free Overnight Shipping

QUANTITY

Increments of 1

Minimum 1

Enter Qty.

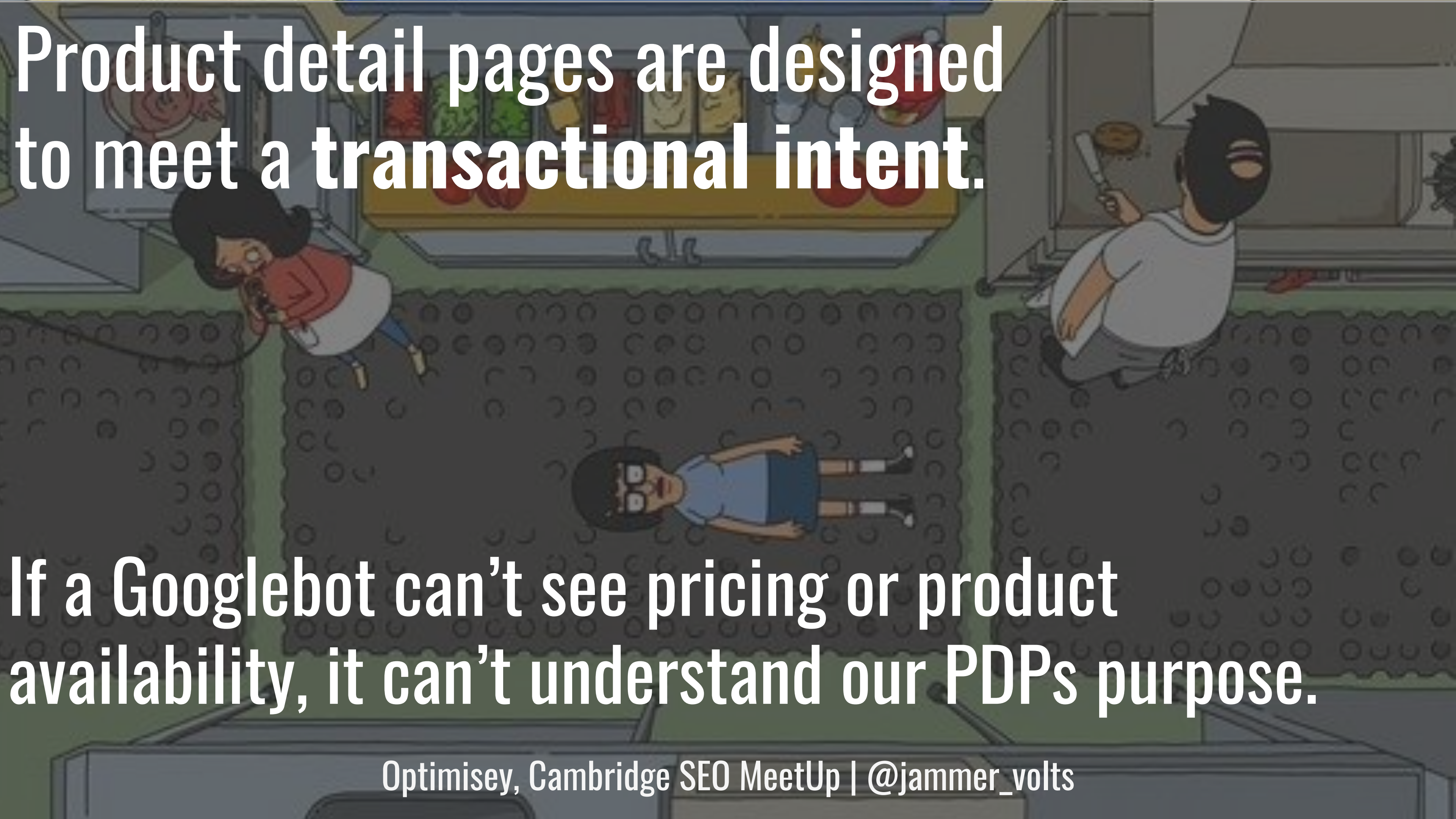
BUY

Add to BOM

TOTAL $0.43

+ FREE OVERNIGHT SHIPPING - DETAILS

Price for 1



Product detail pages are designed to meet a **transactional intent**.

If a Googlebot can’t see pricing or product availability, it can’t understand our PDPs purpose.

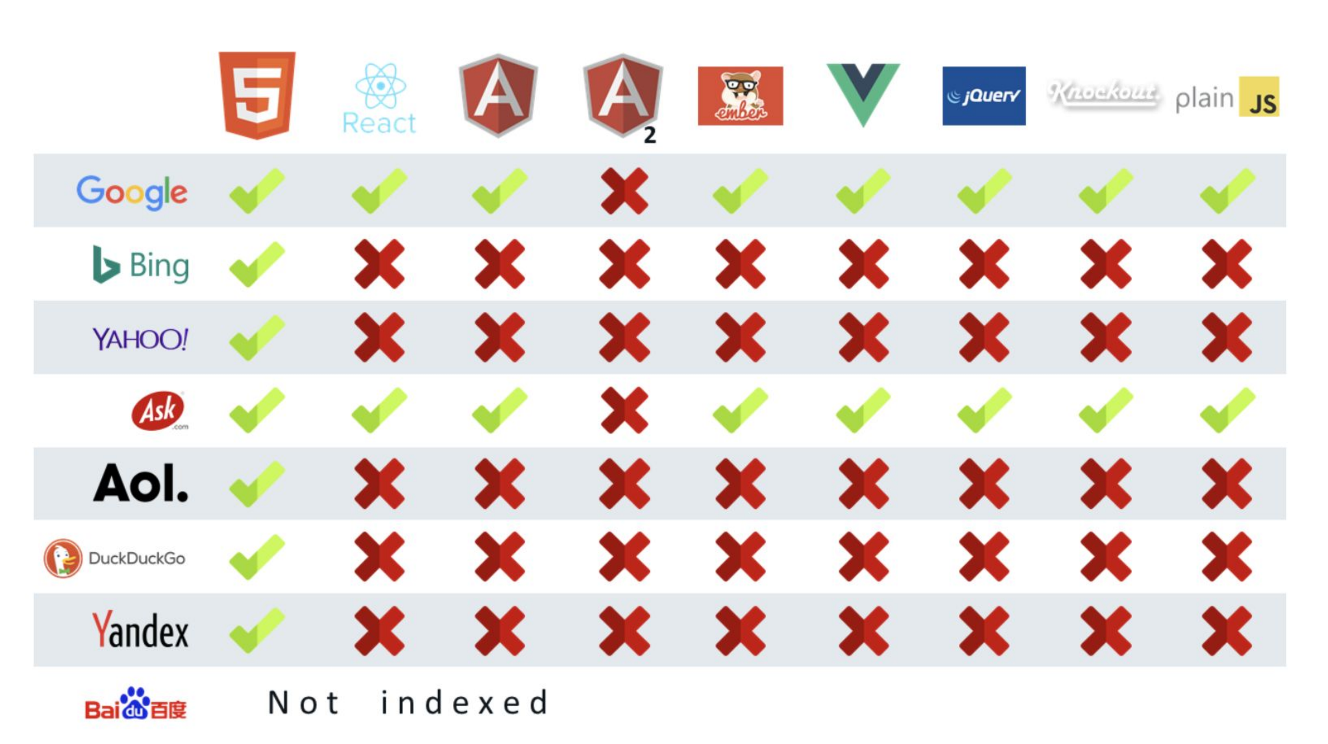
The 4 Truths of Optimized Rendering

Credit: @itsjenmiller

Optimisey, Cambridge SEO MeetUp | @jammer_volts

For content to **rank**, it needs to be **seen**.

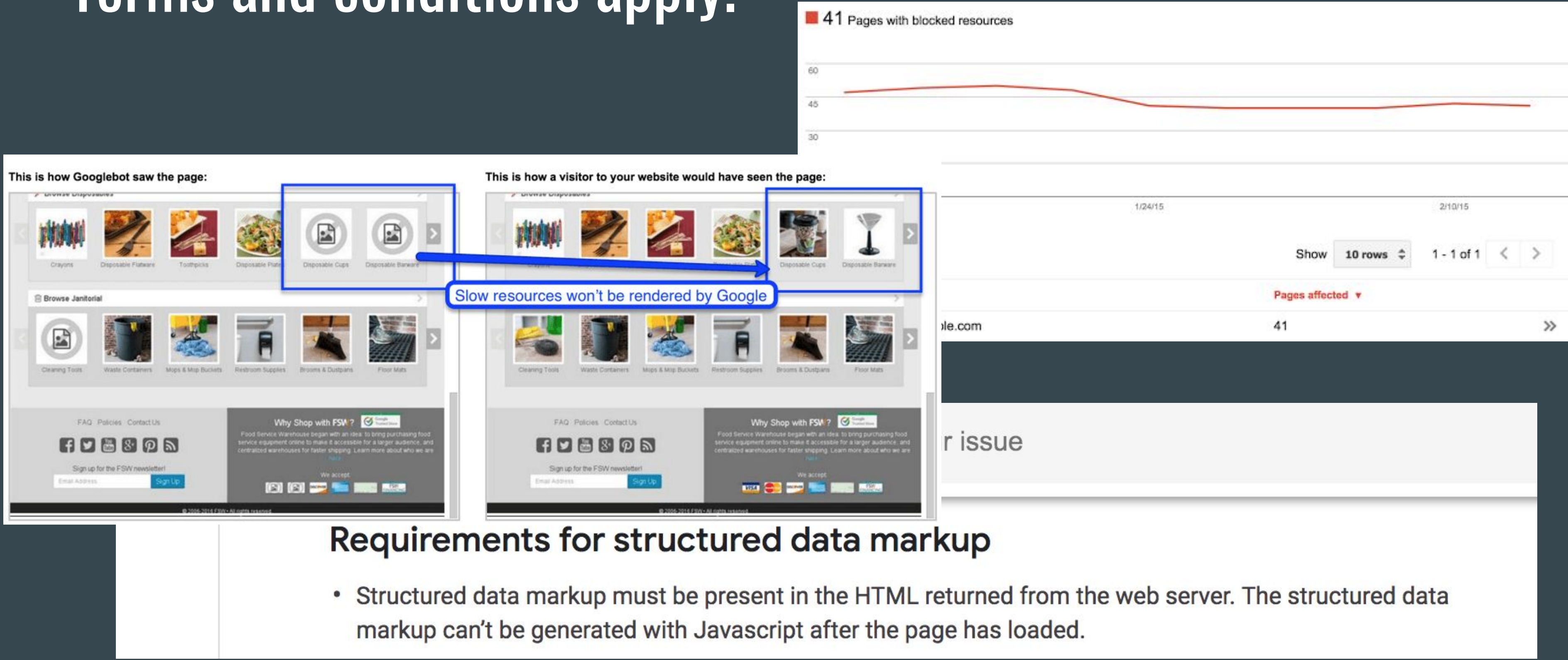
Which search engines can see JavaScript content?



	5	React	A	A 2	ember	V	jQuery	Knockout	plain JS
Google	✓	✓	✓	✗	✓	✓	✓	✓	✓
Bing	✓	✗	✗	✗	✗	✗	✗	✗	✗
YAHOO!	✓	✗	✗	✗	✗	✗	✗	✗	✗
Ask.com	✓	✓	✓	✗	✓	✓	✓	✓	✓
Aol.	✓	✗	✗	✗	✗	✗	✗	✗	✗
DuckDuckGo	✓	✗	✗	✗	✗	✗	✗	✗	✗
Yandex	✓	✗	✗	✗	✗	✗	✗	✗	✗
Baidu 百度	Not indexed								

Source: Bartosz Góralewicz via Moz

*Terms and conditions apply.



This is how Googlebot saw the page:

This is how a visitor to your website would have seen the page:

Slow resources won't be rendered by Google

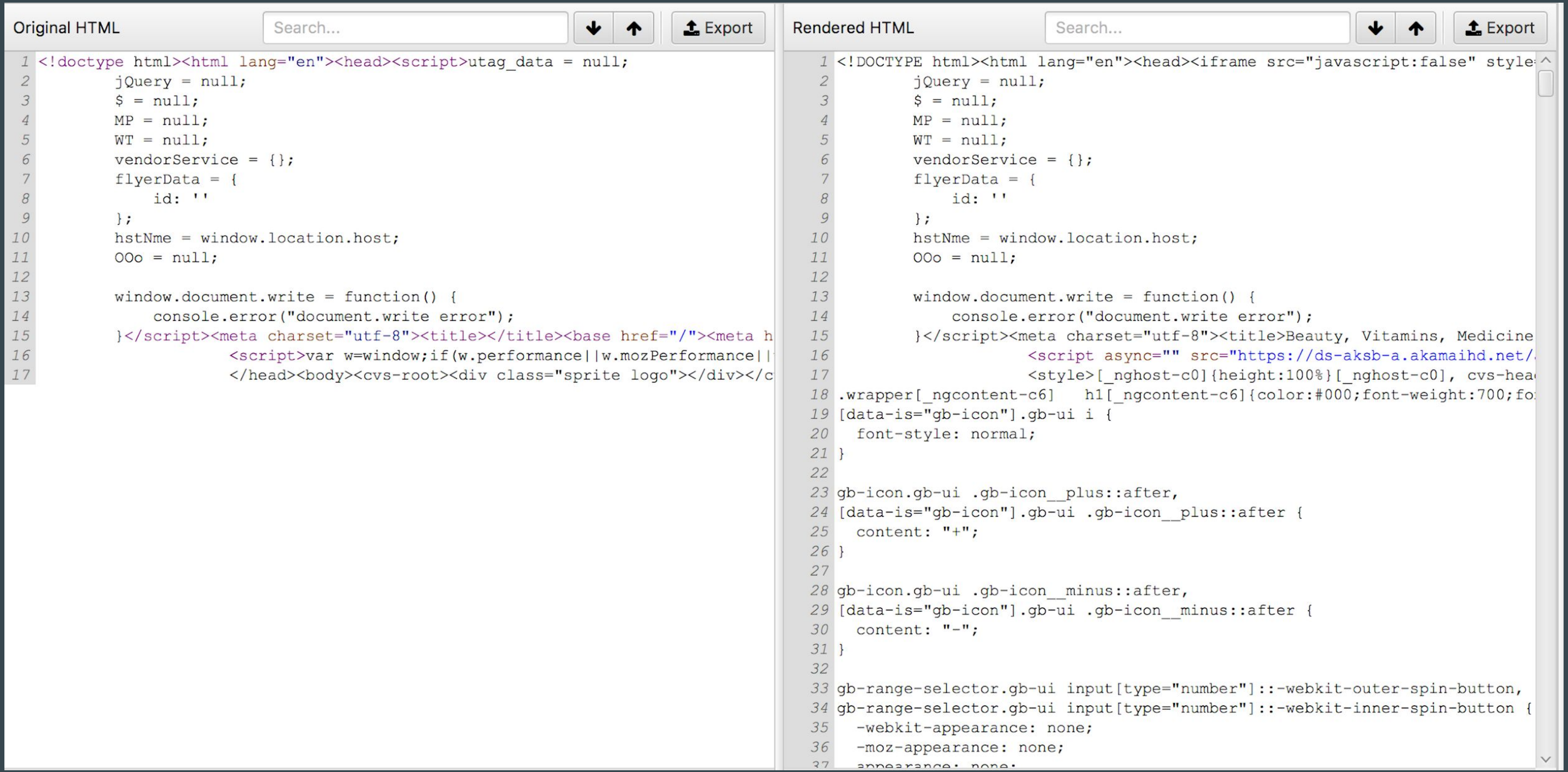
Food Service Warehouse began with an idea: to bring purchasing food service equipment online to make it accessible for a larger audience, and centralized warehouses for faster shipping. Learn more about who we are here.

r issue

Requirements for structured data markup

- Structured data markup must be present in the HTML returned from the web server. The structured data markup can't be generated with Javascript after the page has loaded.

Know the difference between your HTML and Rendered HTML



Original HTML

```
<!doctype html><html lang="en"><head><script>utag_data = null;
        jQuery = null;
        $ = null;
        MP = null;
        WT = null;
        vendorService = {};
        flyerData = {
            id: ''
        };
        hstNme = window.location.host;
        OOo = null;

        window.document.write = function() {
            console.error("document.write error");
        }</script><meta charset="utf-8"><title></title><base href="/"><meta h
                    <script>var w=window;if(w.performance||w.mozPerformance||
                    </head><body><cvs-root><div class="sprite logo"></div></c
```

Rendered HTML

```
<!DOCTYPE html><html lang="en"><head><iframe src="javascript:false" style
        jQuery = null;
        $ = null;
        MP = null;
        WT = null;
        vendorService = {};
        flyerData = {
            id: ''
        };
        hstNme = window.location.host;
        OOo = null;

        window.document.write = function() {
            console.error("document.write error");
        }</script><meta charset="utf-8"><title>Beauty, Vitamins, Medicine
                    <script async="" src="https://ds-aksb-a.akamaihd.net/
                    <style>[_nghost-c0]{height:100%}[_nghost-c0], cvs-hea
.wrapper[_ngcontent-c6]   h1[_ngcontent-c6]{color:#000;font-weight:700;fo
[data-is="gb-icon"].gb-ui i {
  font-style: normal;
}

gb-icon.gb-ui .gb-icon__plus::after,
[data-is="gb-icon"].gb-ui .gb-icon__plus::after {
  content: "+";
}

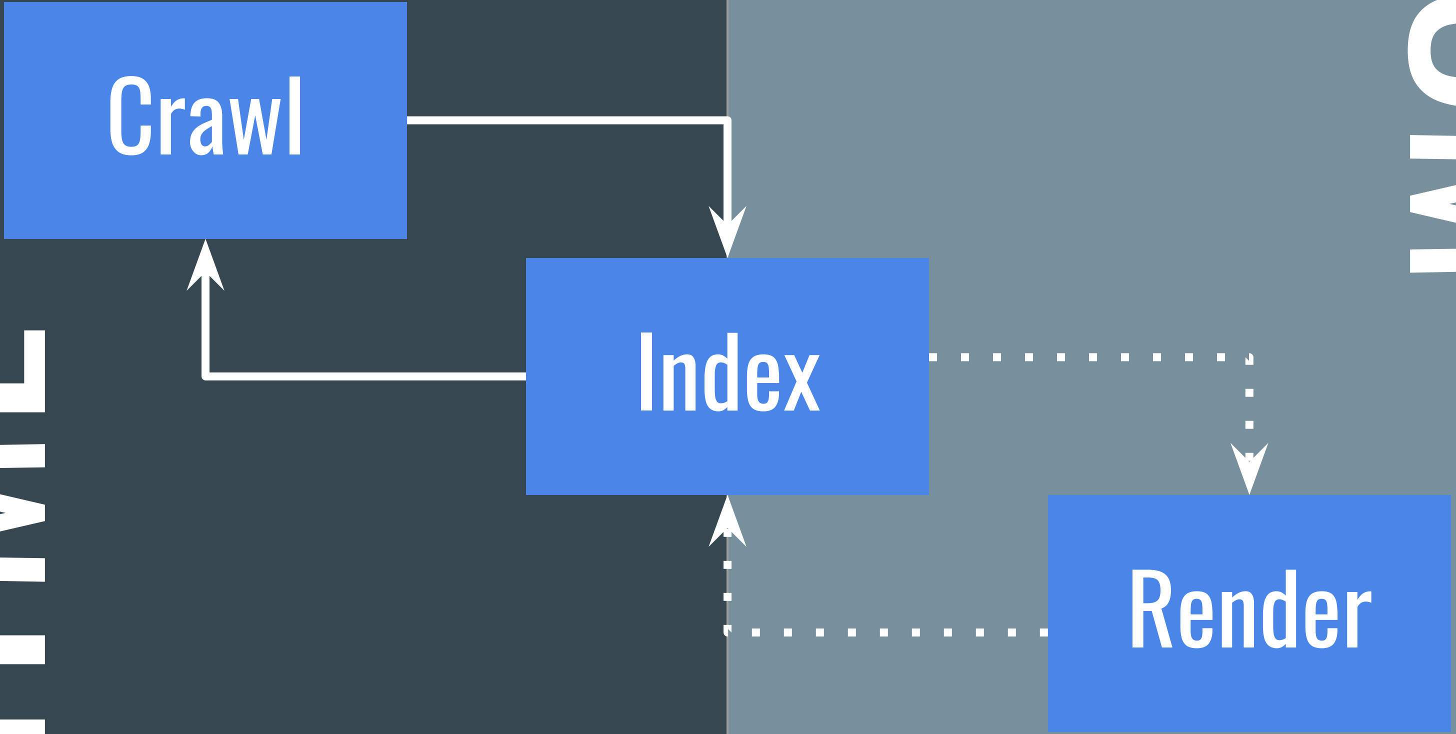
gb-icon.gb-ui .gb-icon__minus::after,
[data-is="gb-icon"].gb-ui .gb-icon__minus::after {
  content: "-";
}

gb-range-selector.gb-ui input[type="number"]::-webkit-outer-spin-button,
gb-range-selector.gb-ui input[type="number"]::-webkit-inner-spin-button {
  -webkit-appearance: none;
  -moz-appearance: none;
  appearance: none;
```

Parse content critical to user intent in initial HTML

2nd wave of indexing

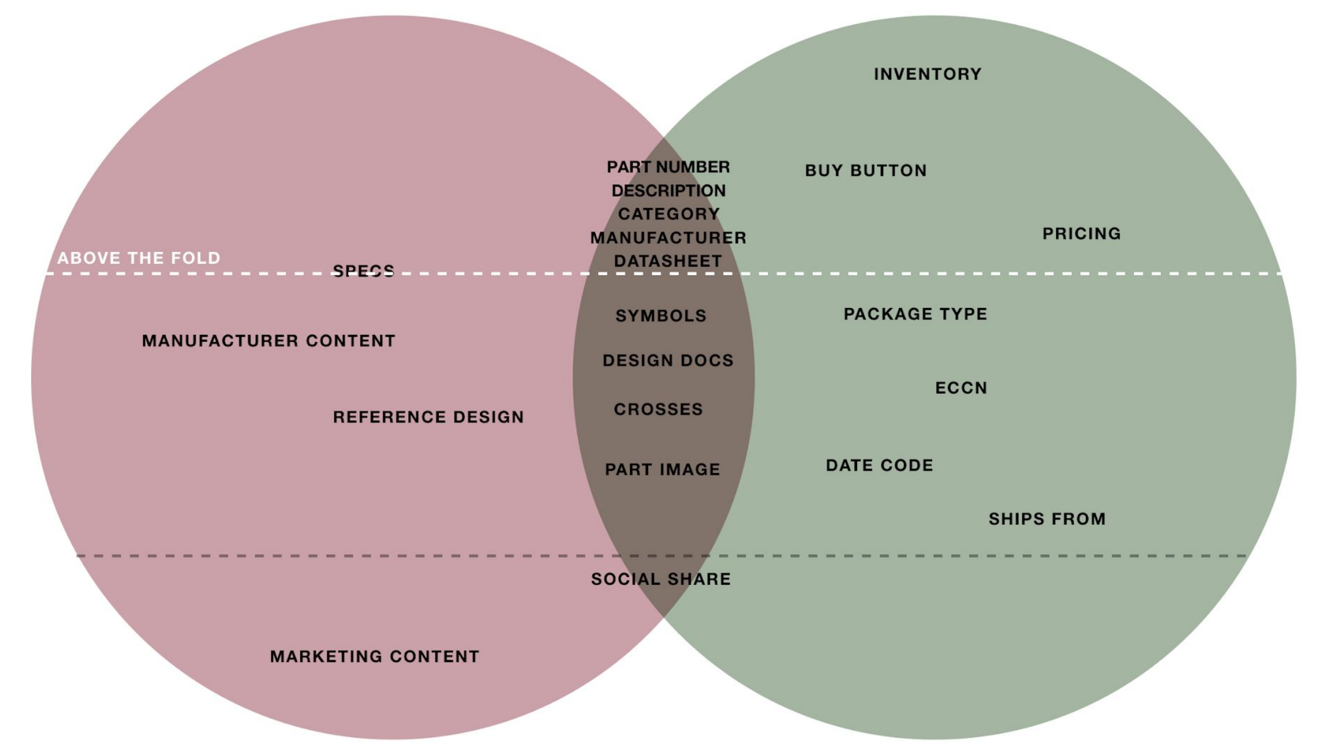
DOM



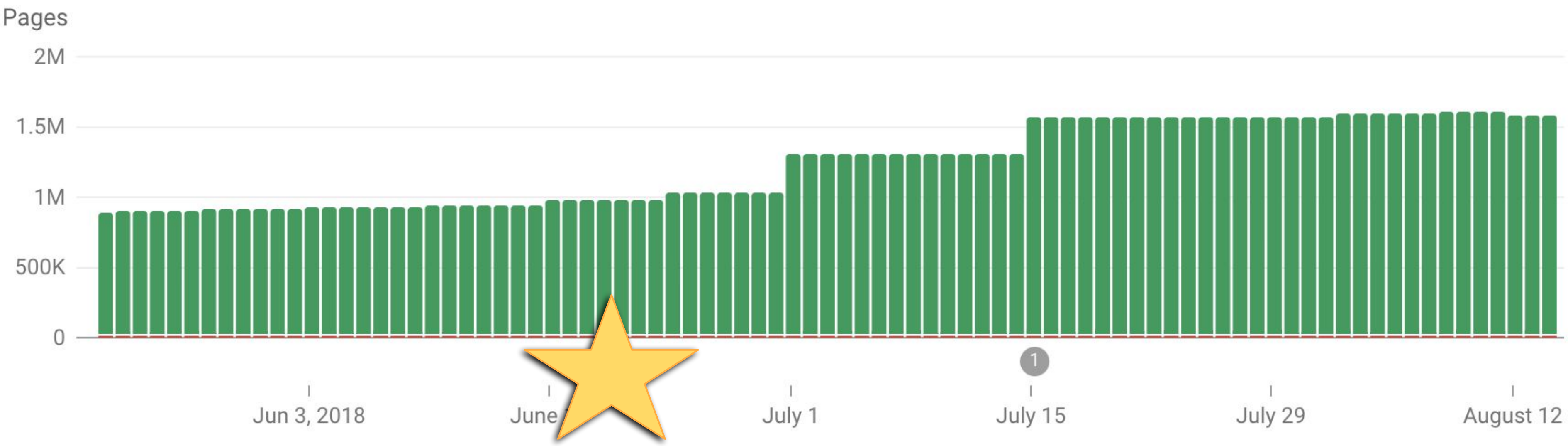
HTML

1st wave of indexing

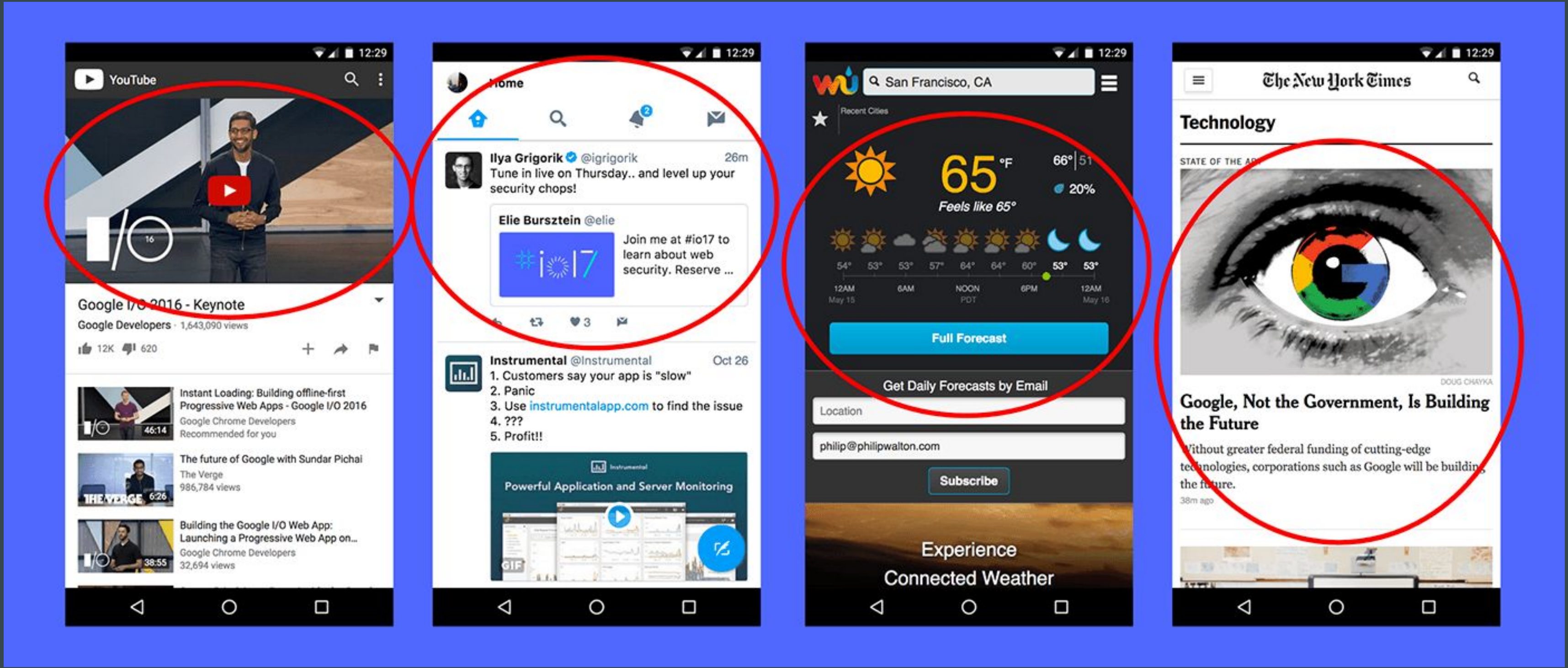
Critical = why the user came



Arrow moved buying elements to html and saw an 80% increase in indexed product detail pages



Define it for your site, by template



12:29

YouTube

Google I/O 2016 - Keynote

Google Developers · 1,643,090 views

12K 620

Instant Loading: Building offline-first Progressive Web Apps - Google I/O 2016
Google Chrome Developers
Recommended for you

The future of Google with Sundar Pichai
The Verge
986,784 views

Building the Google I/O Web App: Launching a Progressive Web App on...
Google Chrome Developers
32,694 views

12:29

Home

Ilya Grigorik @igrigorik 26m
Tune in live on Thursday.. and level up your security chops!

Elie Bursztein @elie
Join me at #io17 to learn about web security. Reserve ...

3

Instrumental @Instrumental Oct 26
1. Customers say your app is "slow"
2. Panic
3. Use instrumentalapp.com to find the issue
4. ???
5. Profit!!

Powerful Application and Server Monitoring

12:29

San Francisco, CA

Recent Cities

65 °F

Feels like 65°

66° | 51

20%

54° 53° 53° 57° 64° 64° 60° 53° 53°

12AM May 15 6AM NOON PDT 6PM 12AM May 16

Full Forecast

Get Daily Forecasts by Email

Location

philip@philipwalton.com

Subscribe

Experience Connected Weather

12:29

The New York Times

Technology

STATE OF THE ART

DOUG CHAYKA

Google, Not the Government, Is Building the Future

Without greater federal funding of cutting-edge technologies, corporations such as Google will be building the future.

38m ago

Source: User-centric Performance Metrics

Optimisey, Cambridge SEO MeetUp | @jammer_volts

Ⅱ

Be **consistent.**

Use clean, consistent signals

Googlebot won’t see past a noindex directive in initial HTML to see an index placed in DOM.

Use clean, consistent signals

Duplicative content without a canonical in initial HTML is crawl waste until rendering.

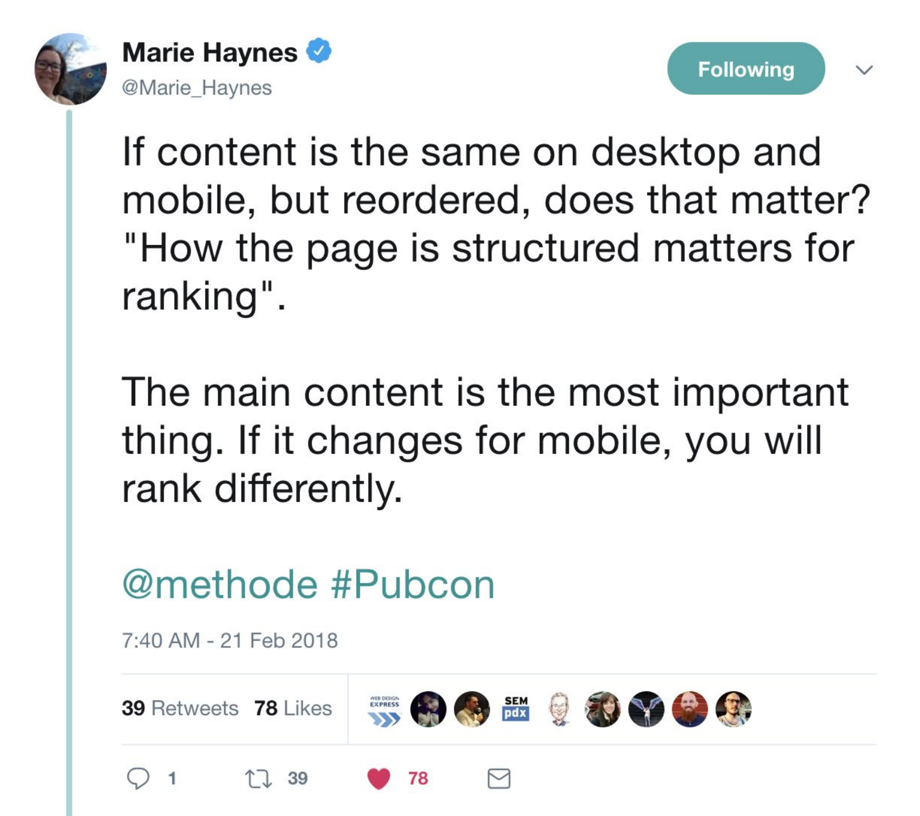
Use clean, consistent signals

Inconsistent title tags and descriptions can result from overwriting the initial HTML with rendered HTML.

Mobile vs Desktop Rendering

Layout matters for both.

If you want to rank for position zero, remember that the content must be exposed on initial mobile load.



Marie Haynes
@Marie_Haynes

If content is the same on desktop and mobile, but reordered, does that matter? "How the page is structured matters for ranking".

The main content is the most important thing. If it changes for mobile, you will rank differently.

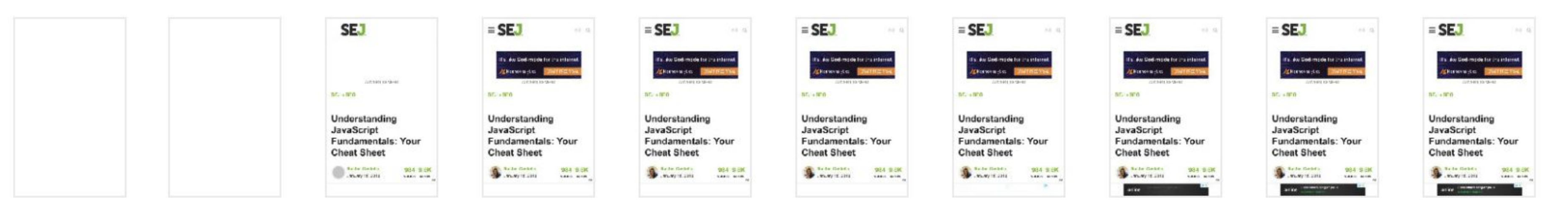
@methode #Pubcon

7:40 AM - 21 Feb 2018

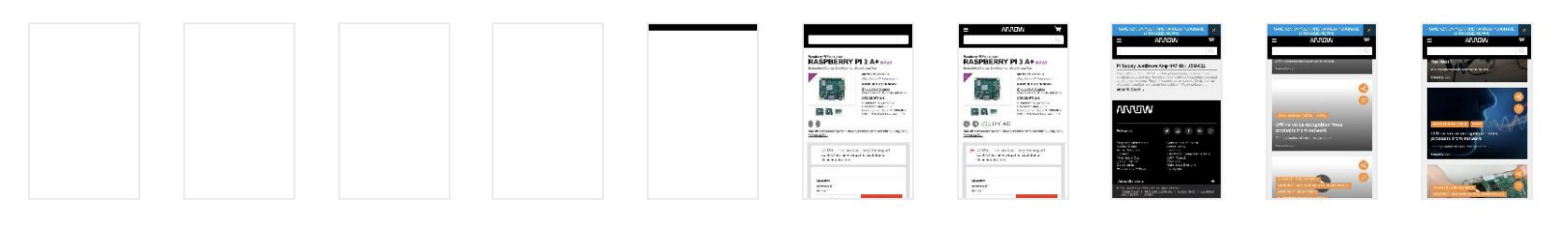
39 Retweets 78 Likes

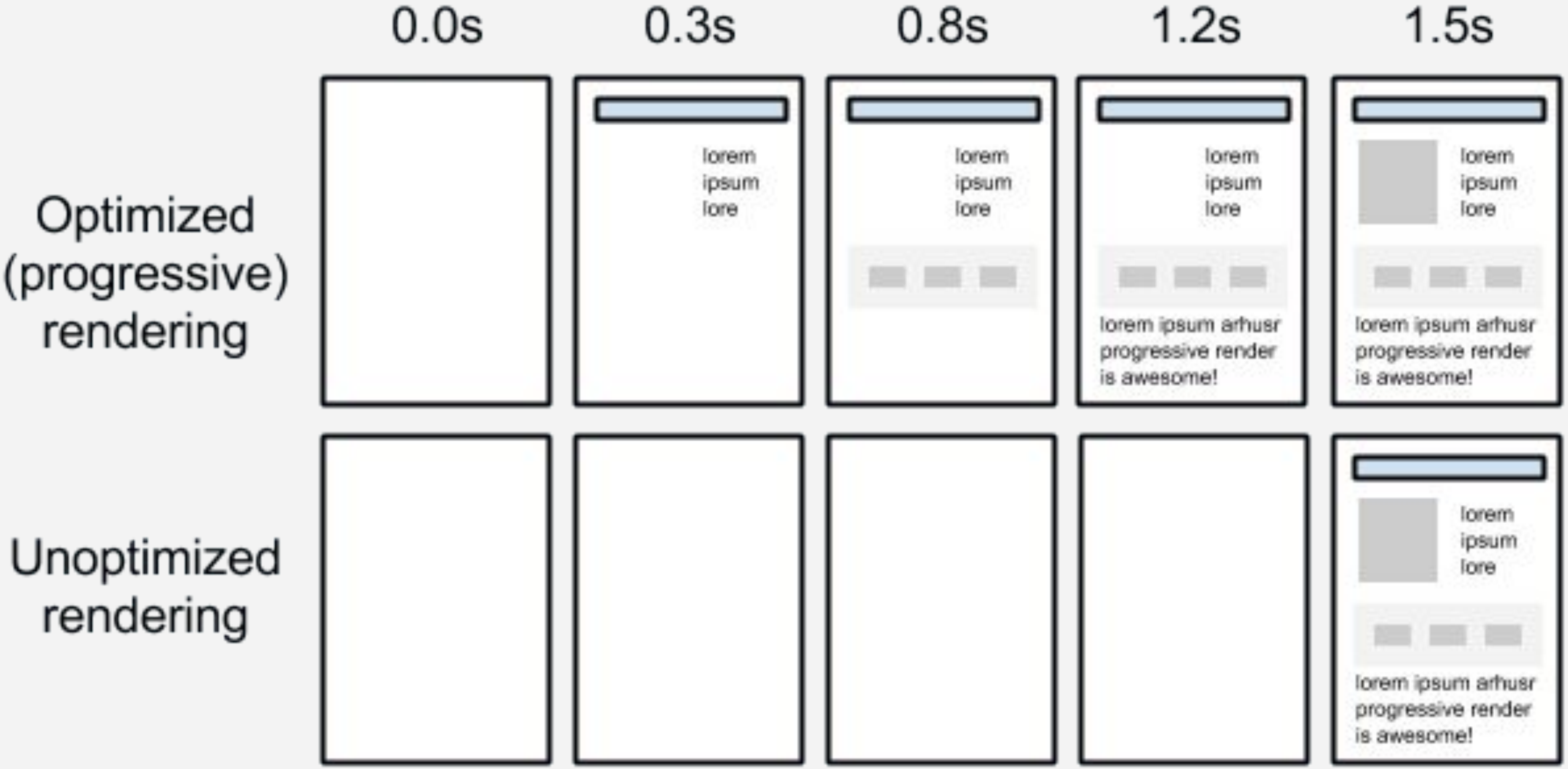
III

Load **what** matters when it **matters.**



Everyone has to wait while JS does it’s thing.





0.0s 0.3s 0.8s 1.2s 1.5s

Optimized (progressive) rendering

Unoptimized rendering

Load scripts & images without blocking

Asynchronous calls are supported with async attributes

```
<rel=”myscript.js” async defer>
```

Lazy load images in Chrome with native attributes

```
<img src=”the-traveler.jpg” loading=”lazy”>
```

Focus rendering efforts with nofollow

If a resource is not valuable to the construction of the page, add a nofollow directive to resources that are not necessary or beneficial to page construction.

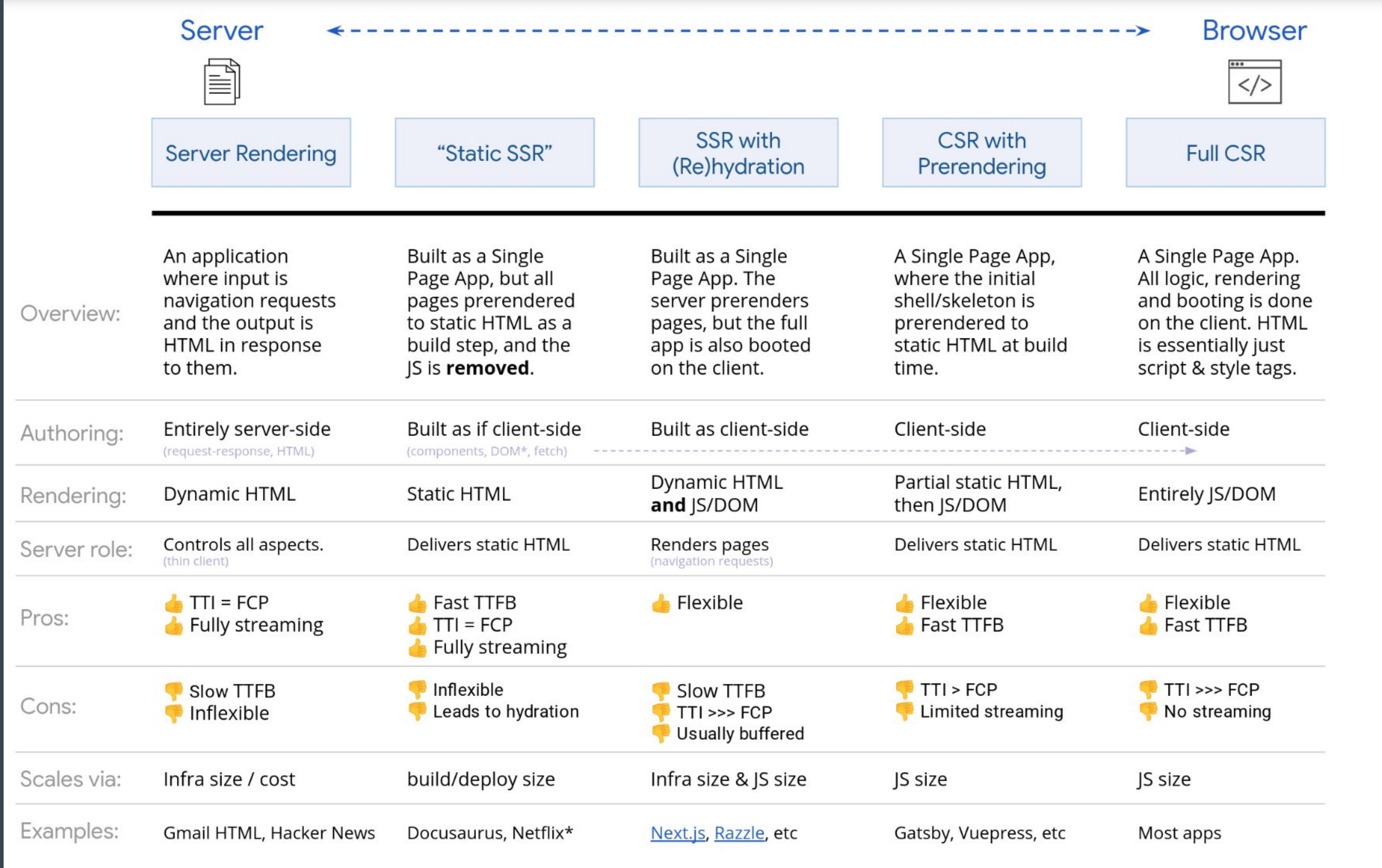
Don’t load stupid sh*t

More pages resources require more rendering resources.

Each resource must be fetched independently before the page can be accurately rendered.

Choose the rendering strategy that’s right for your business and stack.

You don’t have to be 100% client-side, 100% server-side, or 100% both (dynamic).



Server ←→ Browser

	Server Rendering	"Static SSR"	SSR with (Re)hydration	CSR with Prerendering	Full CSR
Overview:	An application where input is navigation requests and the output is HTML in response to them.	Built as a Single Page App, but all pages prerendered to static HTML as a build step, and the JS is **removed**.	Built as a Single Page App. The server prerenders pages, but the full app is also booted on the client.	A Single Page App, where the initial shell/skeleton is prerendered to static HTML at build time.	A Single Page App. All logic, rendering and booting is done on the client. HTML is essentially just script & style tags.
Authoring:	Entirely server-side (request-response, HTML)	Built as if client-side (components, DOM*, fetch)	Built as client-side	Client-side	Client-side
Rendering:	Dynamic HTML	Static HTML	Dynamic HTML **and** JS/DOM	Partial static HTML, then JS/DOM	Entirely JS/DOM
Server role:	Controls all aspects. (thin client)	Delivers static HTML	Renders pages (navigation requests)	Delivers static HTML	Delivers static HTML
Pros:	👍 TTI = FCP 👍 Fully streaming	👍 Fast TTFB 👍 TTI = FCP 👍 Fully streaming	👍 Flexible	👍 Flexible 👍 Fast TTFB	👍 Flexible 👍 Fast TTFB
Cons:	👎 Slow TTFB 👎 Inflexible	👎 Inflexible 👎 Leads to hydration	👎 Slow TTFB 👎 TTI >>> FCP 👎 Usually buffered	👎 TTI > FCP 👎 Limited streaming	👎 TTI >>> FCP 👎 No streaming
Scales via:	Infra size / cost	build/deploy size	Infra size & JS size	JS size	JS size
Examples:	Gmail HTML, Hacker News	Docusaurus, Netflix*	Next.js, Razzle, etc	Gatsby, Vuepress, etc	Most apps

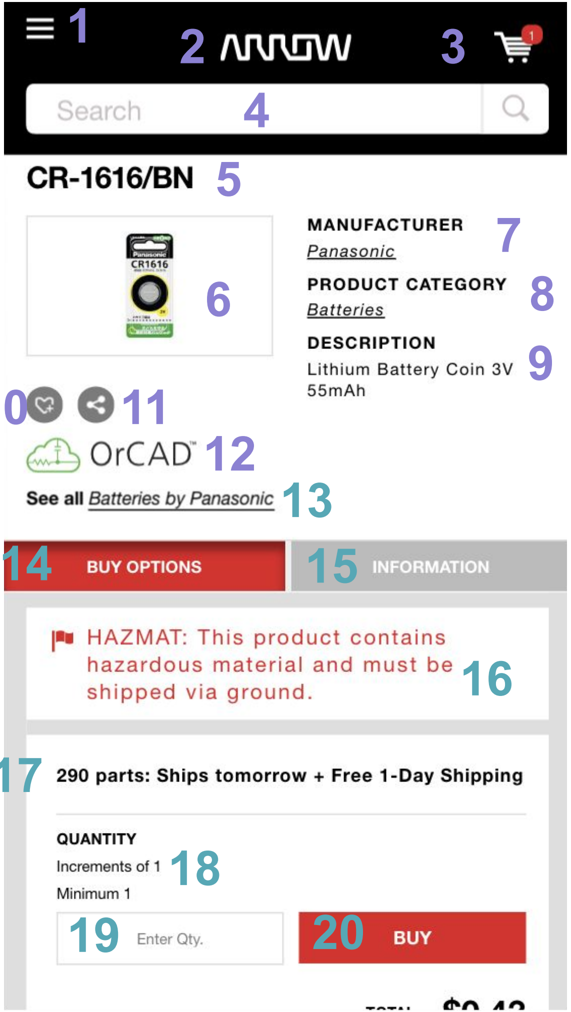
```
|￣￣￣￣￣￣￣￣￣￣￣|
  DON'T BE AFRAID
 TO LEARN IN PUBLIC
|＿＿＿＿＿＿＿＿＿＿＿|
      (\__/)  ||
      (•ㅅ•)  ||
      /   づ
```

IV

Thank you <3

@jammer_volts

/in/jamie-alberico



Search

CR-1616/BN

MANUFACTURER
Panasonic

PRODUCT CATEGORY
Batteries

DESCRIPTION
Lithium Battery Coin 3V 55mAh

OrCAD

See all Batteries by Panasonic

BUY OPTIONS

INFORMATION

HAZMAT: This product contains hazardous material and must be shipped via ground.

290 parts: Ships tomorrow + Free 1-Day Shipping

QUANTITY
Increments of 1
Minimum 1

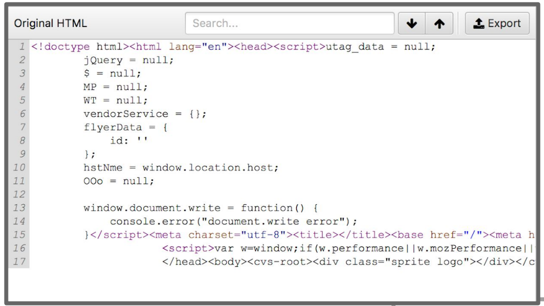
Enter Qty.

BUY

TOTAL $0.42

1 Menu
2 Logo
3 Mini Cart
4 Search
5 SKU
6 Image
7 Manufacturer
8 Category
9 Description
10 Favorite
11 Share
12 ORCAD

13 See all Cat x
14 Manufacturer Buying Options
15 Information
16 Hazmat Alert
17 Stock Count
18 Quantity Info
19 Quantity Input
20 Buy CTA button



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                    <script>var w=window;if(w.performance||w.mozPerformance||
                    </head><body><cvs-root><div class="sprite logo"></div></c
```
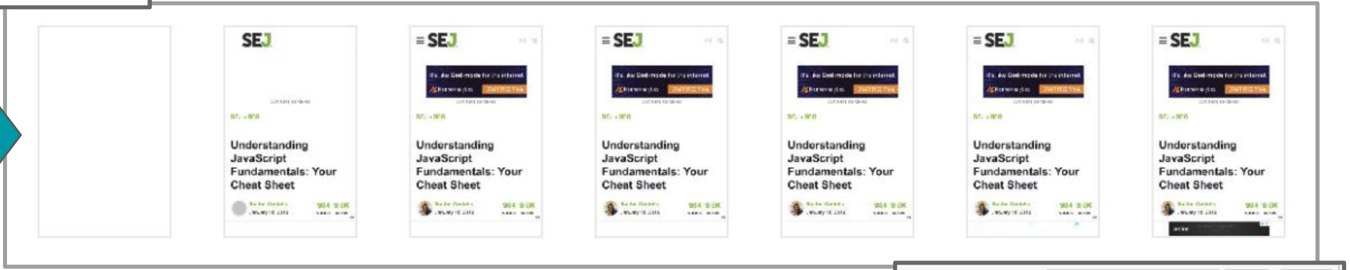
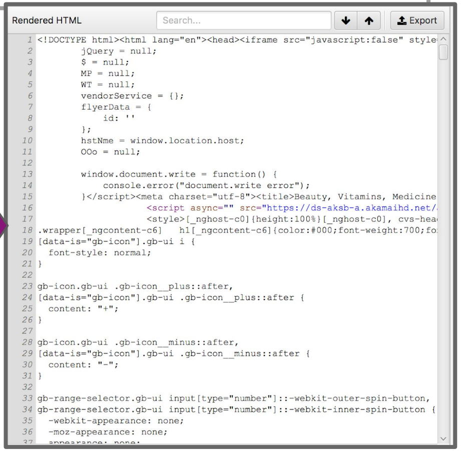

Initial HTML
(1st wave of indexing)

Rendering



Rendered HTML
(2nd Wave of indexing)



```
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        WT = null;
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                    <script async="" src="https://ds-aksb-a.akamaihd.net/
                    <style>[_nghost-c0]{height:100%}[_nghost-c0], cvs-hea
.wrapper[_ngcontent-c6]   h1[_ngcontent-c6]{color:#000;font-weight:700;fo
[data-is="gb-icon"].gb-ui i {
  font-style: normal;
}

gb-icon.gb-ui .gb-icon__plus::after,
[data-is="gb-icon"].gb-ui .gb-icon__plus::after {
  content: "+";
}

gb-icon.gb-ui .gb-icon__minus::after,
[data-is="gb-icon"].gb-ui .gb-icon__minus::after {
  content: "-";
}

gb-range-selector.gb-ui input[type="number"]::-webkit-outer-spin-button,
gb-range-selector.gb-ui input[type="number"]::-webkit-inner-spin-button {
  -webkit-appearance: none;
  -moz-appearance: none;
  appearance: none;
```
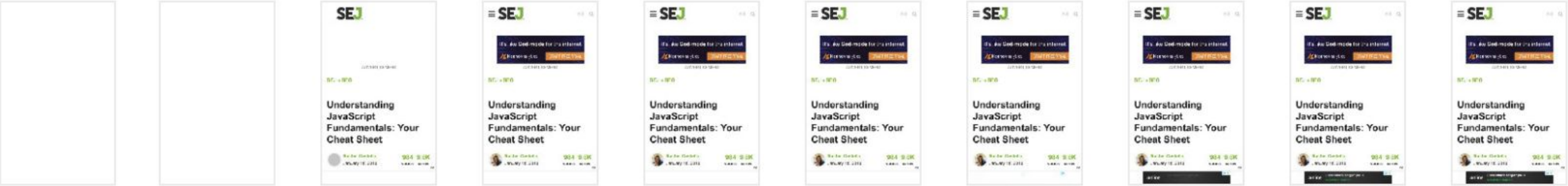
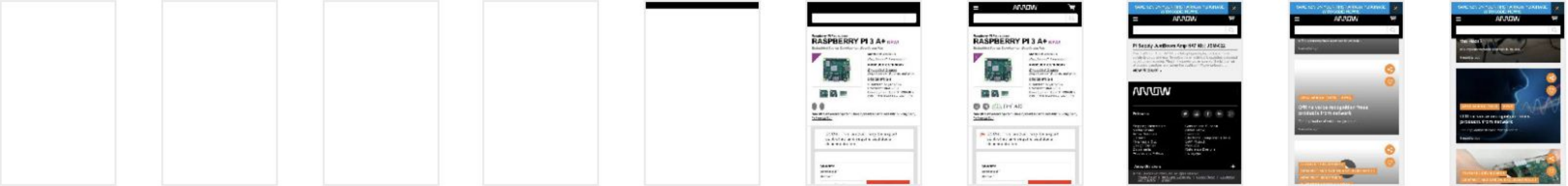
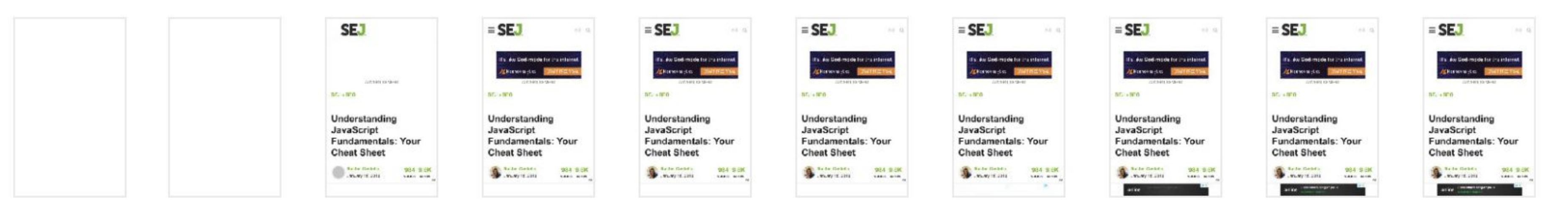

Not a Robot



Humans and search engines must wait on scripts





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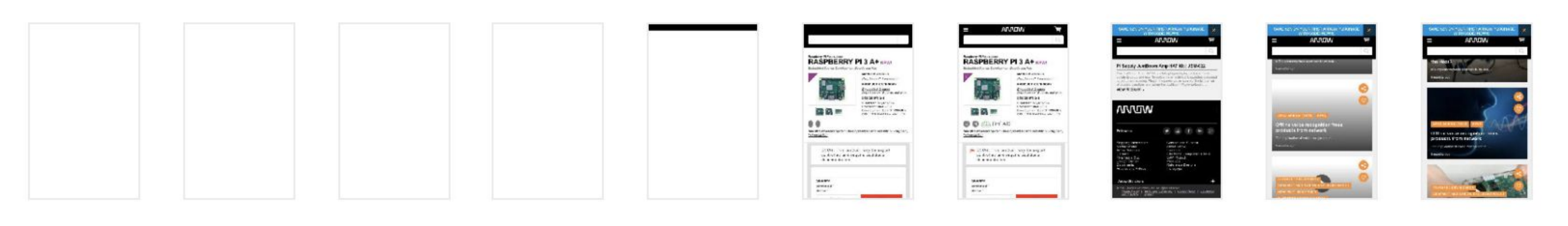
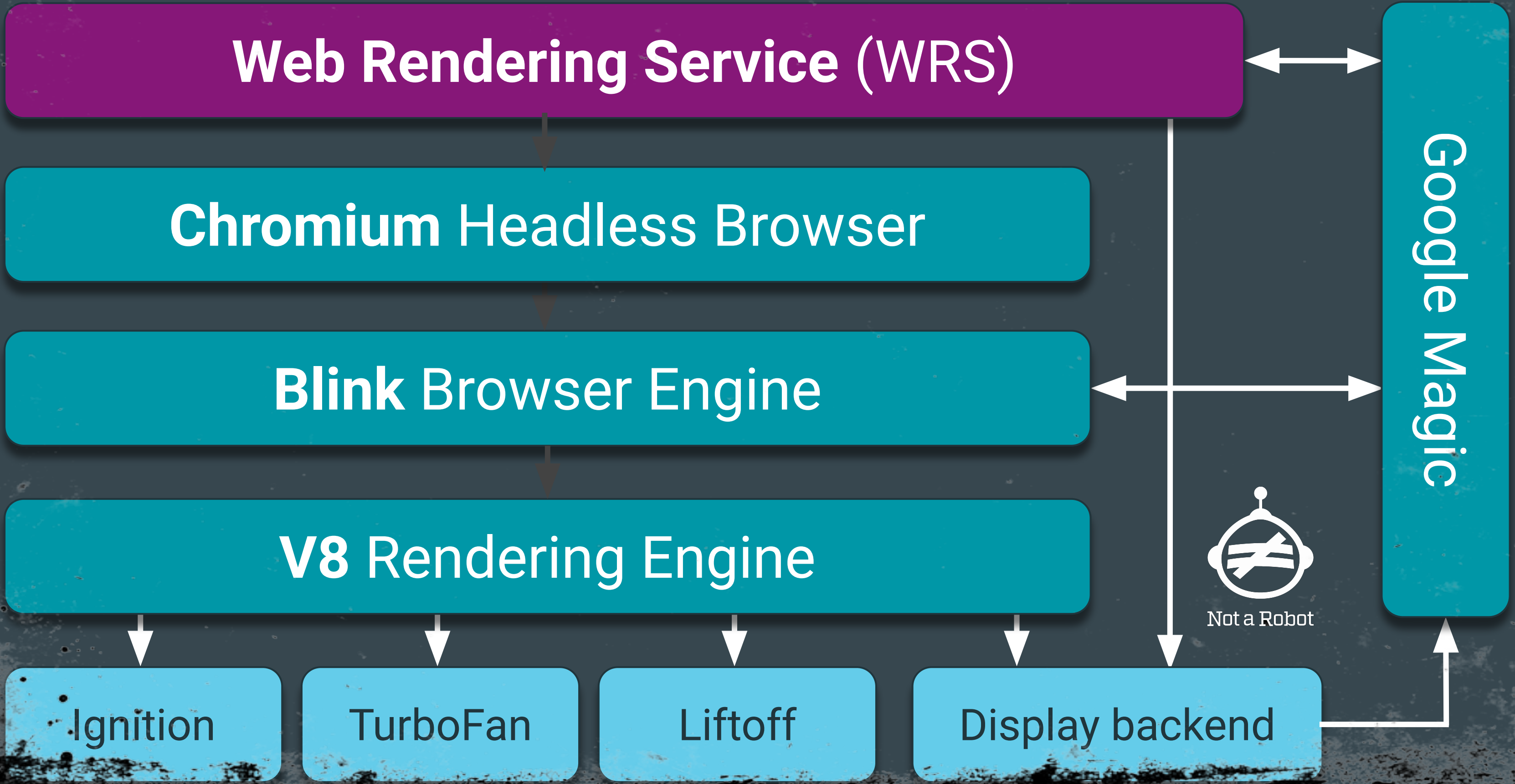


Anatomy of Google's Web Rendering Service

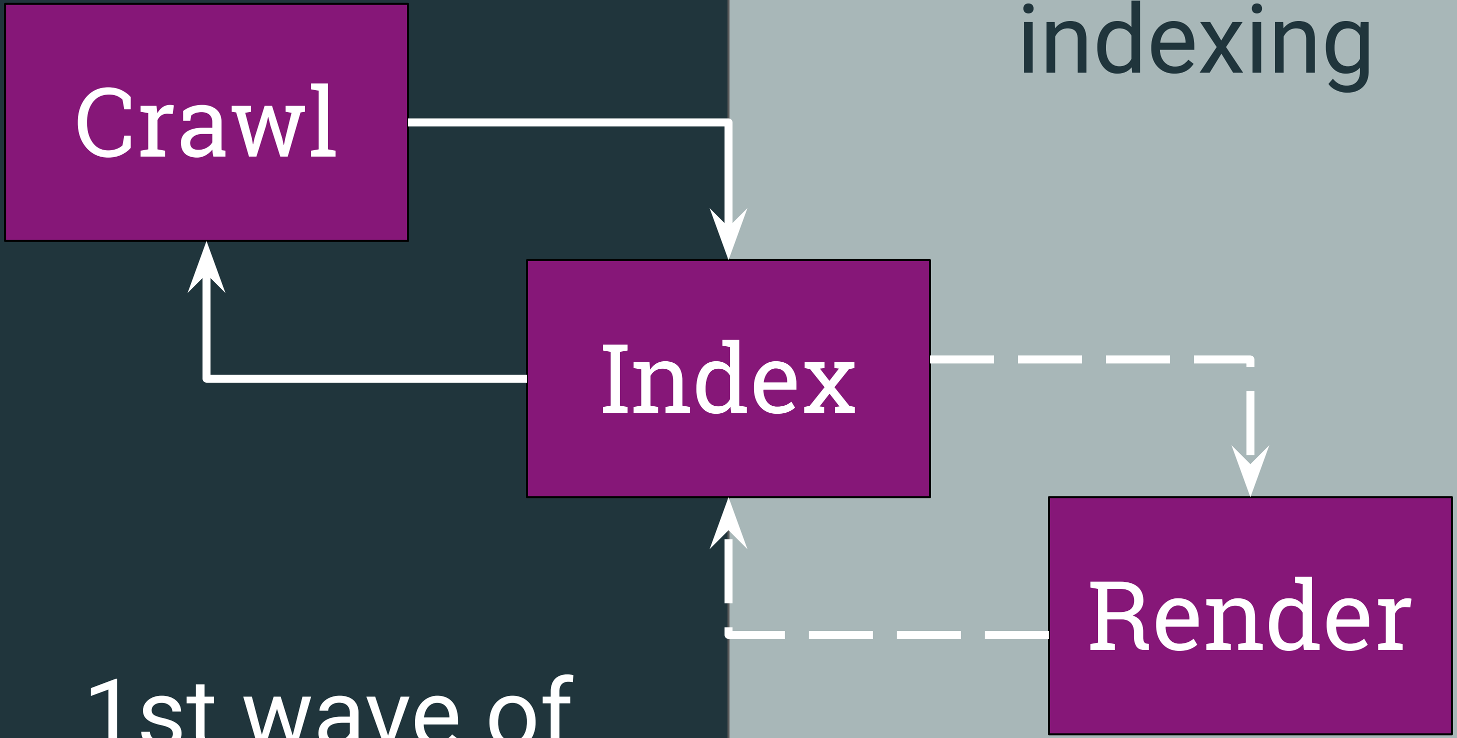


V8’s components

- **Ignition**, a fast low-level register-based JavaScript interpreter written using the backend of TurboFan
- **TurboFan**, one of V8’s optimizing compilers
- **Liftoff**, a new baseline compiler for WebAssembly

2nd wave of indexing

DOM



Crawl

Index

Render

HTML

1st wave of indexing