

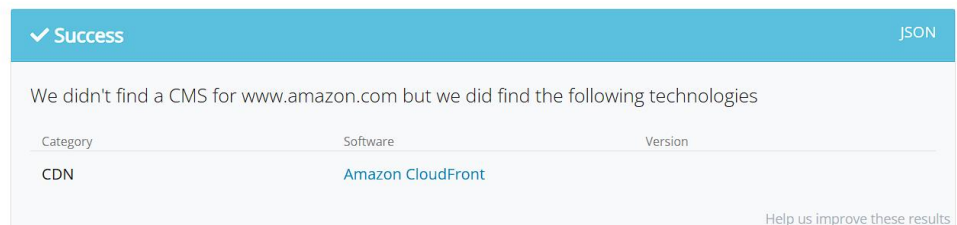
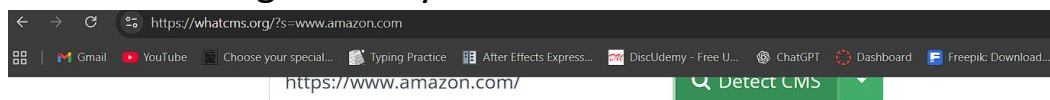
2.2.2.1. Website Selection & Technology Analysis (6 points)

Select and analyze three websites from different domains:

Required Categories:

1. E-commerce Platform: Amazon

- Complete homepage URL: <https://www.amazon.com/>
- Server location: **23.214.210.134 United Kingdom (GB)**
- Technology stack identification:
 - Content Management System:



amazon.com	
Content Management Systems	
Below is a summary of content management systems found on amazon.com	
Checked Pages	CMS
53	Adobe Experience Manager
30	Ruby on Rails
29	WordPress
2	Next.js
1	Discourse
1	Microsoft Word
2	Readme.io
6	Brightspot

- Frontend frameworks:

Programming languages



Python

○ Identify using browser DevTools: javascript

- Initial measurements:

328 requests	7.2 MB transferred	9.8 MB resources	Finish: 10.77 s	DOMContentLoaded: 1.45 s
312 requests	7.1 MB transferred	9.6 MB resources	Finish: 4.40 s	DOMContentLoaded: 1.72 s
280 requests	3.2 MB transferred	5.8 MB resources	Finish: 8.06 s	DOMContentLoaded: 2.50 s

- Page load time: 10.77s, 4.40s, 8.06s average: 7.74s
- Total page size: 9.8MB, 9.6MB, 5.8MB average: 8.4MB
- Transferred size: 7.2MB, 7.1MB, 3.2MB average: 5.83MB
- Number of HTTP requests: 328, 312, 280 requests average: 306.67
- Number of images, scripts, stylesheets:
- Img: 263/328, 259/312, 238/280 average: 0.827

263 / 328 requests	5,733 kB / 7,170 kB transferred	5,587 kB / 9,760 kB resources	Finish: 10.77 s
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259 / 312 requests	5,734 kB / 7,129 kB transferred	5,557 kB / 9,571 kB resources	Finish: 5.26 s
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238 / 280 requests	3,279 kB / 4,461 kB transferred	3,132 kB / 6,934 kB resources	Finish: 10.40 s
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- Scripts: 30/328, 25/312, 22/280 average: 0.083

30 / 328 requests	869 kB / 7,170 kB transferred	2,168 kB / 9,760 kB resources	Finish: 10.77 s
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25 / 312 requests	844 kB / 7,129 kB transferred	2,097 kB / 9,571 kB resources	Finish: 5.26 s
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22 / 280 requests	835 kB / 4,461 kB transferred	2,086 kB / 6,934 kB resources	Finish: 10.40 s
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- Stylesheets: 10/328, 8/312, 8/280 average: 0.028

10 / 328 requests	122 kB / 7,170 kB transferred	982 kB / 9,760 kB resources	Finish: 10.77 s
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8 / 312 requests	110 kB / 7,129 kB transferred	901 kB / 9,571 kB resources	Finish: 5.26 s
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8 / 280 requests	109 kB / 4,461 kB transferred	901 kB / 6,934 kB resources	Finish: 10.40 s
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2. News/Media Outlet: CNN:


- Complete homepage URL: <https://edition.cnn.com/>
- Server location: **151.101.3.5 Canada (Montreal)**
- Technology stack identification:
 - Content Management System:


cnn.com	
Content Management Systems	
Below is a summary of content management systems found on cnn.com	
Checked Pages	CMS
40	WordPress
5	Shopify
10	Next.js
2	Drupal
2	Brightspot
1	WooComm


- Frontend frameworks:

JavaScript frameworks


UI frameworks

 [React](#)

 [HeroUI](#)

 [styled-components](#)

Programming languages

6.1.16  [PHP](#)

- Identify using browser DevTools: javascript

- Initial measurements:

195 requests	10.6 MB transferred	25.1 MB resources	Finish: 10.84 s	DOMContentLoaded: 10.84 s
200 requests	16.9 MB transferred	32.6 MB resources	Finish: 10.53 s	DOMContentLoaded: 10.53 s
198 requests	12.4 MB transferred	26.9 MB resources	Finish: 11.33 s	DOMContentLoaded: 11.33 s

- Page load time:10.84s, 10.53s, 11.33s average:10.90s

- Total page size: 25.1MB, 32.6MB, 26.9MB average:28.2MB
- Transferred size: 10.6MB, 16.9MB, 12.4MB average:13.3MB
- Number of HTTP requests: 195, 200 ,198 requests average:197.67
- Number of images, scripts, stylesheets:
- Img: 71/195 , 73/200, 72/198 average:0.364

71 / 195 requests	2,699 kB / 16,860 kB transferred	2,658 kB / 32,648 kB resources	Finish: 16.70
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73 / 200 requests	3,073 kB / 17,233 kB transferred	3,029 kB / 33,020 kB resources	Finish: 11.19
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72 / 198 requests	2,700 kB / 16,862 kB transferred	2,658 kB / 32,649 kB resources	Finish: 12.71
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- Scripts: 68/195 , 68/200, 68/198 average:0.344

68 / 195 requests	6,640 kB / 16,860 kB transferred	17,806 kB / 32,648 kB resources	Finish: 16.70
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68 / 200 requests	6,640 kB / 17,233 kB transferred	17,806 kB / 33,020 kB resources	Finish: 11.19
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68 / 198 requests	6,641 kB / 16,862 kB transferred	17,806 kB / 32,649 kB resources	Finish: 12.71
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- Stylesheets: 9/195 , 9/200, 9/198 average:0.046

9 / 195 requests	48.0 kB / 16,860 kB transferred	263 kB / 32,648 kB resources	Finish: 16.70
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9 / 200 requests	48.0 kB / 17,233 kB transferred	263 kB / 33,020 kB resources	Finish: 11.19
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9 / 198 requests	48.0 kB / 16,862 kB transferred	263 kB / 32,649 kB resources	Finish: 12.71
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3. Educational Institution: Coursera:

- Complete homepage URL: <https://www.coursera.org/>
- Server location: **18.164.116.69 United States (Ashburn)**
- Technology stack identification:
 - Content Management System:




coursera.org	
Content Management Systems	
Below is a summary of content management systems found on coursera.org	
Checked Pages	CMS
21	WordPress
6	Gatsby
36	Contentful
1	Octopress

- Frontend frameworks:

JavaScript frameworks

-  [JSS](#)
-  [Emotion](#)

Programming languages

-  [TypeScript](#) 50% sure
-  [GraphQL](#)
-  [Node.js](#)

- Identify using browser DevTools: javascript , react

- Initial measurements:

136 requests	2.8 MB transferred	6.9 MB resources	Finish: 6.29 s	DOMContentLoaded: 1.20 s
125 requests	2.7 MB transferred	6.6 MB resources	Finish: 3.92 s	DOMContentLoaded: 1.45 s
89 requests	2.3 MB transferred	6.1 MB resources	Finish: 4.01 s	DOMContentLoaded: 1.80 s

- Page load time: 6.29s, 3.92s, 4.01s average: 4.74s
- Total page size: 6.9MB, 6.6MB, 6.1MB average: 6.53MB
- Transferred size: 2.8MB, 2.7MB, 2.3MB average: 2.6MB
- Number of HTTP requests: 136, 125, 89 requests average: 116.67
- Number of images, scripts, stylesheets:
- Img: 75/136, 75/125, 41/89 average: 0.537

75 / 136 requests	989 kB / 2,846 kB transferred	946 kB / 6,868 kB resources	Finish: 6.61 s
75 / 125 requests	989 kB / 2,740 kB transferred	946 kB / 6,613 kB resources	Finish: 3.92 s
41 / 89 requests	523 kB / 2,273 kB transferred	500 kB / 6,167 kB resources	Finish: 4.25 s

- Scripts: 32/136 , 31/125, 31/89 average:0.277

32 / 136 requests	1,696 kB / 2,846 kB transferred	5,157 kB / 6,868 kB resources	Finish: 6.61 s
31 / 125 requests	1,605 kB / 2,740 kB transferred	4,914 kB / 6,613 kB resources	Finish: 3.92 s
31 / 89 requests	1,605 kB / 2,273 kB transferred	4,914 kB / 6,167 kB resources	Finish: 4.25 s

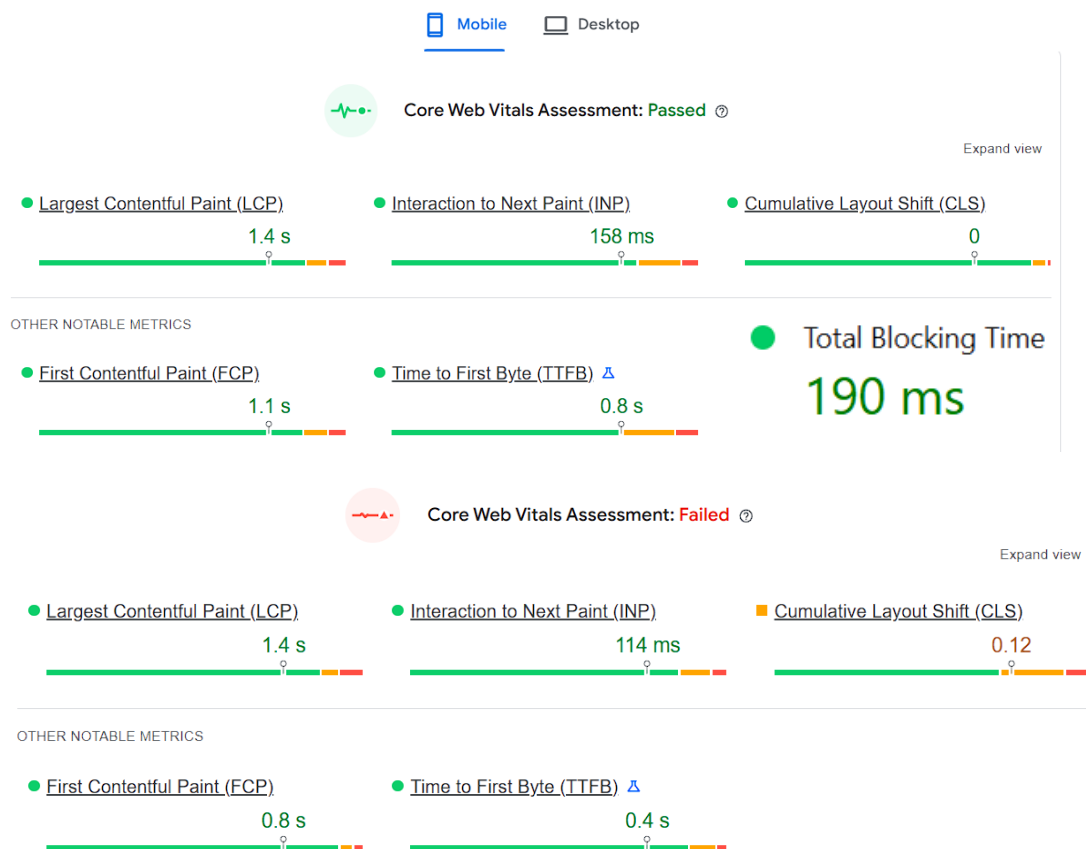
- Stylesheets: 3/136 , 2/125, 2/89 average:0.020

3 / 136 requests	9.4 kB / 2,846 kB transferred	46.0 kB / 6,868 kB resources	Finish: 6.61 s
2 / 125 requests	9.0 kB / 2,740 kB transferred	45.3 kB / 6,613 kB resources	Finish: 3.92 s
2 / 89 requests	9.0 kB / 2,273 kB transferred	45.3 kB / 6,167 kB resources	Finish: 4.25 s

2.2.2.2. Core Web Vitals Measurement & Analysis (10 points):

1. E-commerce Platform: Amazon

- Complete homepage URL: <https://www.amazon.com/>



- Largest Contentful Paint (LCP): 1.1s mobile , 1.4s desktop
- Interaction to Next Paint (INP): 158ms mobile , 114ms desktop
- Cumulative Layout Shift (CLS): 0 mobile , 0.12 desktop

	Mobile	Desktop
LCP	1.1s	1.4s
INP	158ms	114ms
CLS	0	0.12

- Identify top 3 issues flagged by Lighthouse for each site:

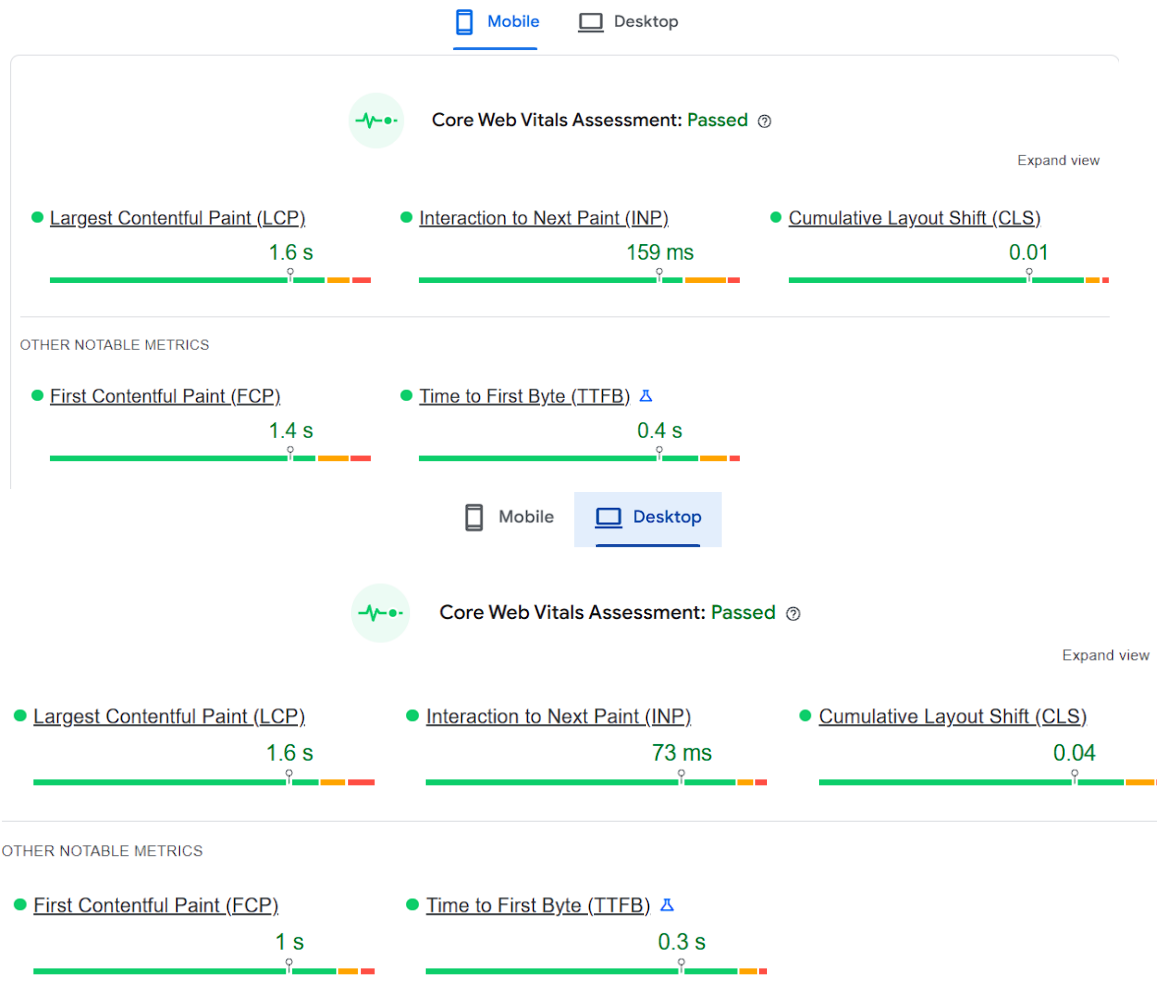
- ❖ **Render blocking requests** — Est savings of 1,330 ms
Slows initial rendering and LCP
- ❖ **Font display** — Est savings of 30 ms
Text renders slower than fonts load

❖ ▲ LCP breakdown

LCP loads slowly so main content takes time to appear

2. News/Media Outlet: CNN

Complete homepage URL: <https://edition.cnn.com/>



- Largest Contentful Paint (LCP): 1.6s mobile , 1.6s desktop
- Interaction to Next Paint (INP): 159ms mobile , 73ms desktop
- Cumulative Layout Shift (CLS): 0.01 mobile , 0.04 desktop

	Mobile	Desktop
LCP	1.6s	1.6s
INP	159ms	73ms
CLS	0.01	0.04

- Identify top 3 issues flagged by Lighthouse for each site:

❖ ▲ Use efficient cache lifetimes — Est savings of 15,421 KiB

Browser redownloads files unnecessarily

❖ ▲ Legacy JavaScript — Est savings of 139 KiB

Older scripts increase load time and block rendering

❖ ▲ Forced reflow

Layout shifts cause slower rendering

3. Educational Institution: Coursera




- Complete homepage URL: <https://www.coursera.org/>



- Largest Contentful Paint (LCP): 3.2s mobile , 3.1s desktop
- Interaction to Next Paint (INP): 634ms mobile , 165ms desktop
- Cumulative Layout Shift (CLS): 0.07 mobile , 0.03 desktop

	Mobile	Desktop
LCP	3.2s	3.1s
INP	634ms	165ms
CLS	0.07	0.13

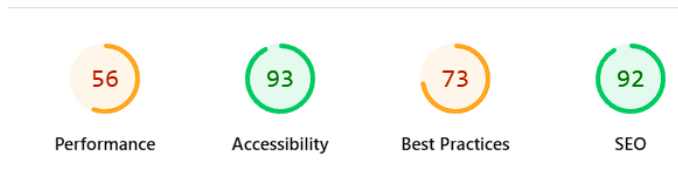
- Identify top 3 issues flagged by Lighthouse for each site:

- ❖  Improve image delivery — Est savings of 561 KiB
Large images slow loading, needs compression
- ❖  Use efficient cache lifetimes — Est savings of 222 KiB
Browser redownloads files unnecessarily
- ❖  LCP breakdown
LCP loads slowly so main content takes time to appear

2.2.2.3. Comparative Analysis & Optimization Strategy:

1. E-commerce Platform: Amazon

- Complete homepage URL: <https://www.amazon.com/>



2. News/Media Outlet: CNN:

- Complete homepage URL: <https://edition.cnn.com/>



3. Educational Institution: Coursera:

- Complete homepage URL: <https://www.coursera.org/>



❖ Create Comparison Table Including:

- + Overall performance scores (0-100)
- + Load time comparison from Page load time in 2.2.2.1. Website Selection & Technology Analysis
- + Core Web Vitals scores
- + Page size and request count from Number of HTTP requests 2.2.2.1. Website Selection & Technology Analysis
- + Performance ranking (1st, 2nd, 3rd place)

	Amazon			CNN			Coursera		
Overall performance scores (0-100)	56			25			38		
Load time comparison	7.74s			10.90s			4.74s		
Core Web Vitals scores		Mobile	Desktop		Mobile	Desktop		Mobile	Desktop
	LCP	1.1s	1.4s	LCP	1.6s	1.6s	LCP	3.2s	3.1s
	INP	158ms	114ms	INP	159ms	73ms	INP	634ms	165ms
	CLS	0	0.12	CLS	0.01	0.04	CLS	0.07	0.13
Page size and request count	306.67			197.67			116.67		
Performance ranking (1st, 2nd, 3rd place)	2nd			3rd			1 st		

A. Performance Bottleneck Identification:

- 1) Unoptimized images : Images are large and not compressed which increases load time and network usage
- 2) Lack of caching: Browser redownloads files unnecessarily
- 3) Render-blocking resources: Multiple scripts and styles must load before content becomes active so delaying page render happens
- 4) Too many HTTP requests: High number of resource requests cause longer loading sequences

B. Concrete Optimization Recommendations:

- 1) Image Optimization: Step 1>Find heavy images, Step 2>Compress images, Step 3>Decrease width/height
- 2) Code Optimization: Step 1>Decrease code size , Step 2>Remove unused code
- 3) Caching Strategy: Step 1>Set cache headers/servers, Step 3>Register a service worker that caches key routes and assets
- 4) Critical Rendering Path: Step 1>Extract critical CSS, Step 2>Make JavaScript load later, Step 3>Load important files early
- 5) Content Delivery: Step 1>Turn on file compression, Step 2>Enable compression in hosting