

Comparative Analysis & Optimization Strategy Report

*Performance Evaluation of CNN, Galala University,
and Noon*

Based on Mobile & Desktop Metrics

December 2, 2025

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1 Revised Executive Summary & Methodology

1.1 Executive Summary

This report evaluates the performance of three websites—**CNN**, **Galala University (GU)**, and **Noon**—using Google PageSpeed Insights in both Mobile and Desktop modes.

Collecting data from both device types provides a broader understanding of how each website behaves under different conditions. However, all comparisons, rankings, bottleneck identification, and optimization recommendations in this report are based primarily on **Mobile performance**, as mobile metrics are more demanding, more relevant to real-world users, and aligned with the assignment requirements. Desktop results are included only to provide additional context in the findings.

1.2 Methodology

The methodology followed a standardized testing approach:

1. **Analysis:** Each website was analyzed using PageSpeed Insights in both Mobile and Desktop modes.
2. **Data Collection:** Key performance metrics were collected, including Performance Score, Largest Contentful Paint (LCP), Interaction to Next Paint (INP), Cumulative Layout Shift (CLS), and load-related timings such as FCP and TBT.
3. **Comparison:** A comparison table was generated (based on Mobile results) to evaluate differences across websites.
4. **Deep Dive:** The worst-performing website was identified using Mobile results and analyzed in detail, including bottleneck identification and optimization recommendations.

This approach ensures consistent measurement and provides a clear pathway for improving performance according to industry best practices.

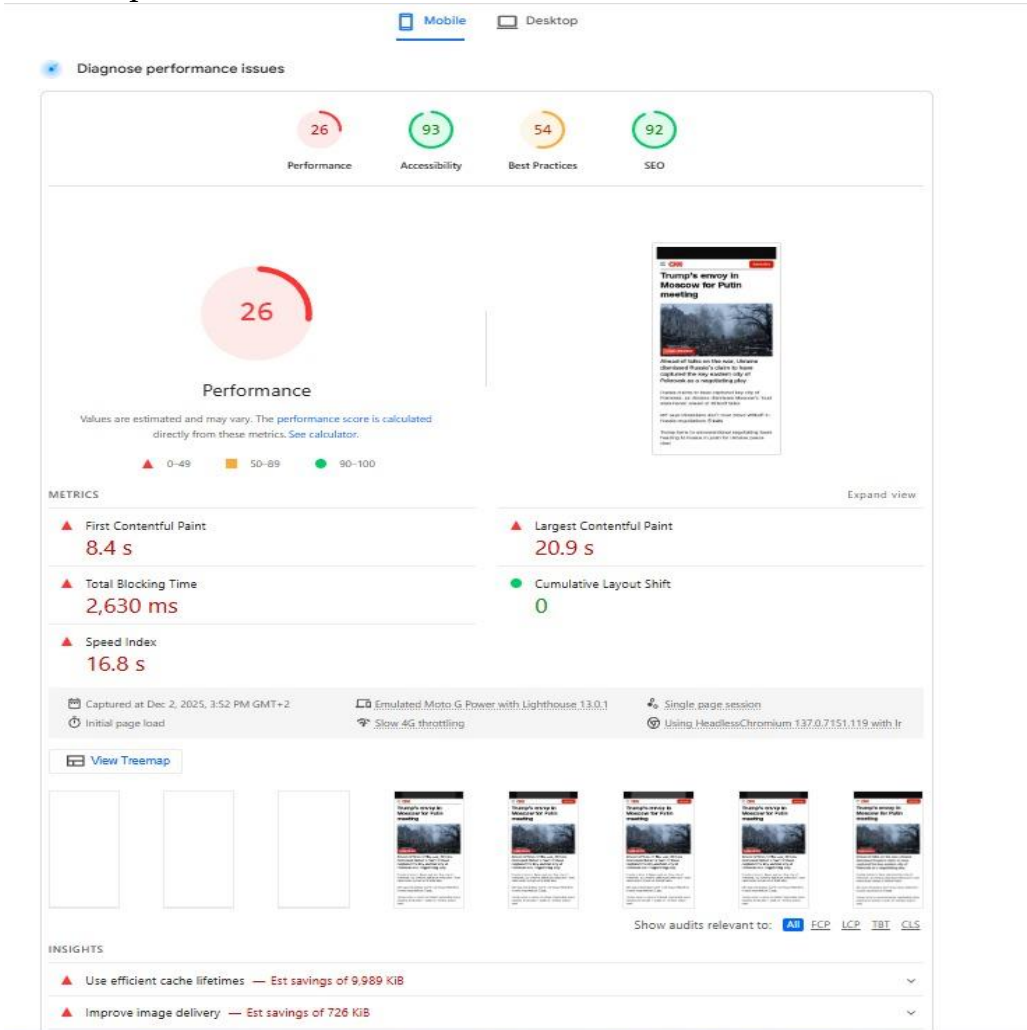
2 Detailed Findings for Each Website

2.1 1. CNN Mobile Performance

Status: Weakest Performance

Metric	Value
Performance Score	26
Largest Contentful Paint (LCP)	20.9s
Interaction to Next Paint (INP)	159ms
Cumulative Layout Shift (CLS)	0.01
First Contentful Paint (FCP)	8.4s
Total Blocking Time (TBT)	2630ms

Analysis: CNN shows the weakest performance among the tested websites. Its extremely high LCP and TBT indicate render-blocking scripts, unoptimized images, and inefficient resource delivery, which severely degrade the mobile user experience.



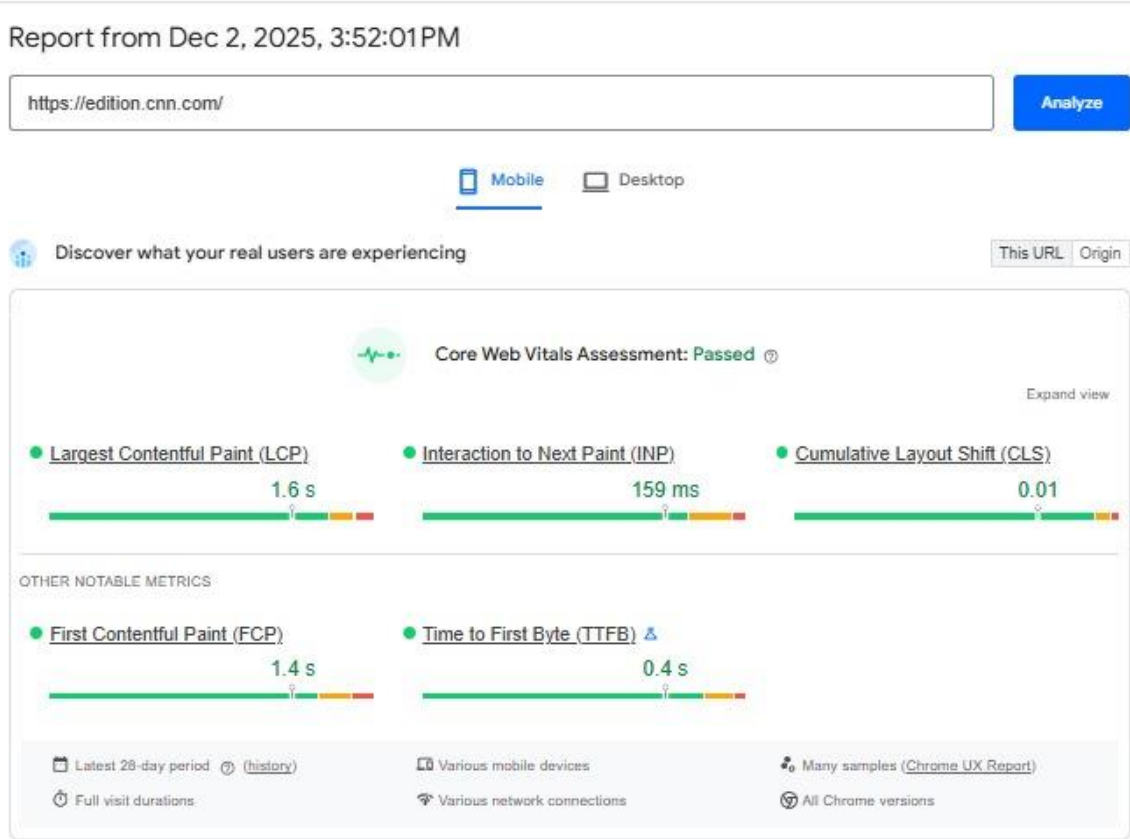


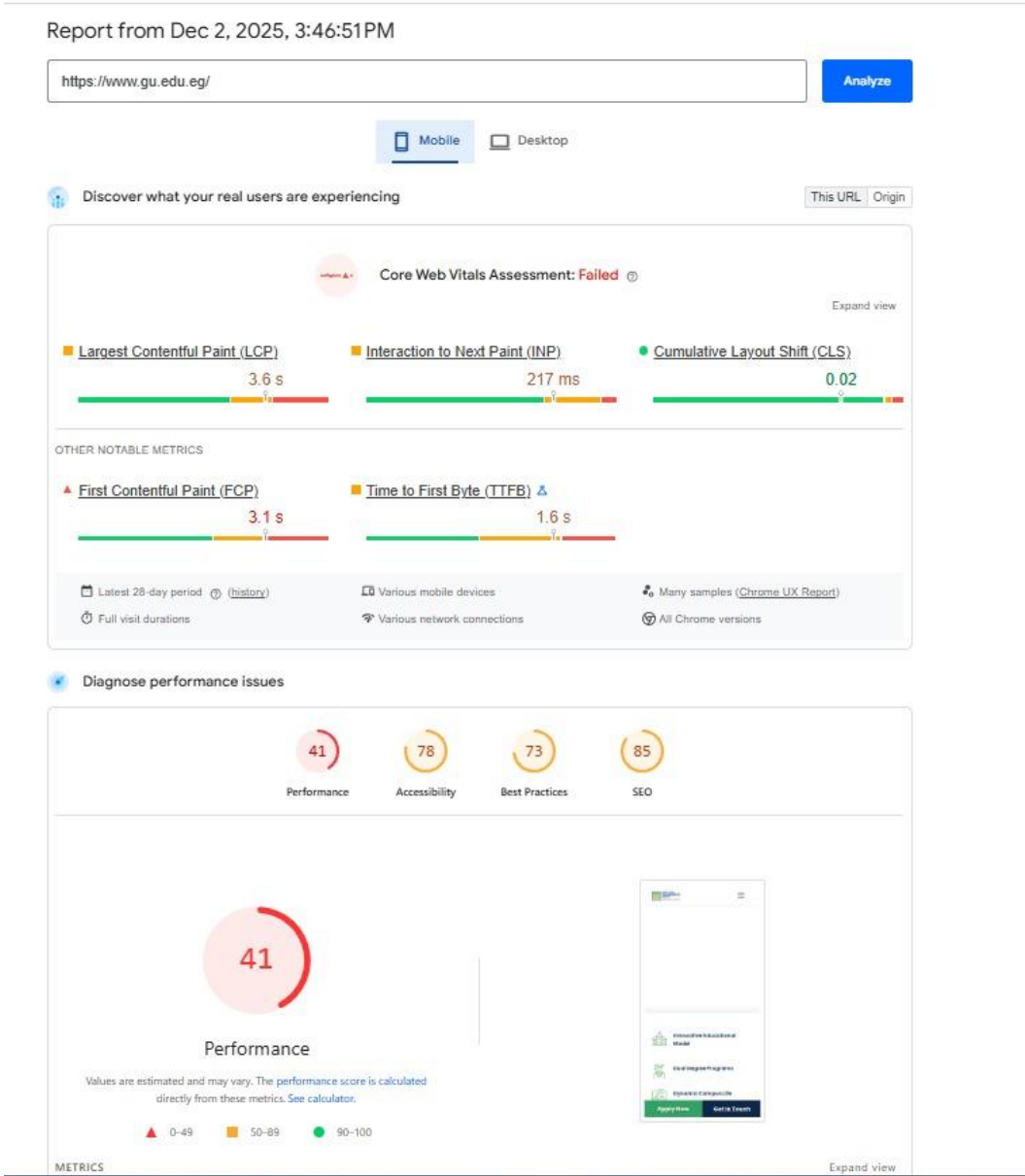
Figure 1: CNN Mobile Performance Overview

2.2 2. Galala University (GU) Mobile Performance

Status: Moderate Performance

Metric	Value
Performance Score	41
LCP	3.6s
INP	217ms
CLS	0.02
FCP	3.1s
Time to First Byte (TTFB)	1.6s

Analysis: The GU website demonstrates moderate performance. Its Core Web Vitals are acceptable, but server response time and overall loading speed show clear room for improvement.



Analysis: Noon performs the best overall. It achieves the fastest loading speeds and perfect layout stability, although the LCP can still be improved to meet the ideal threshold (< 2.5s).

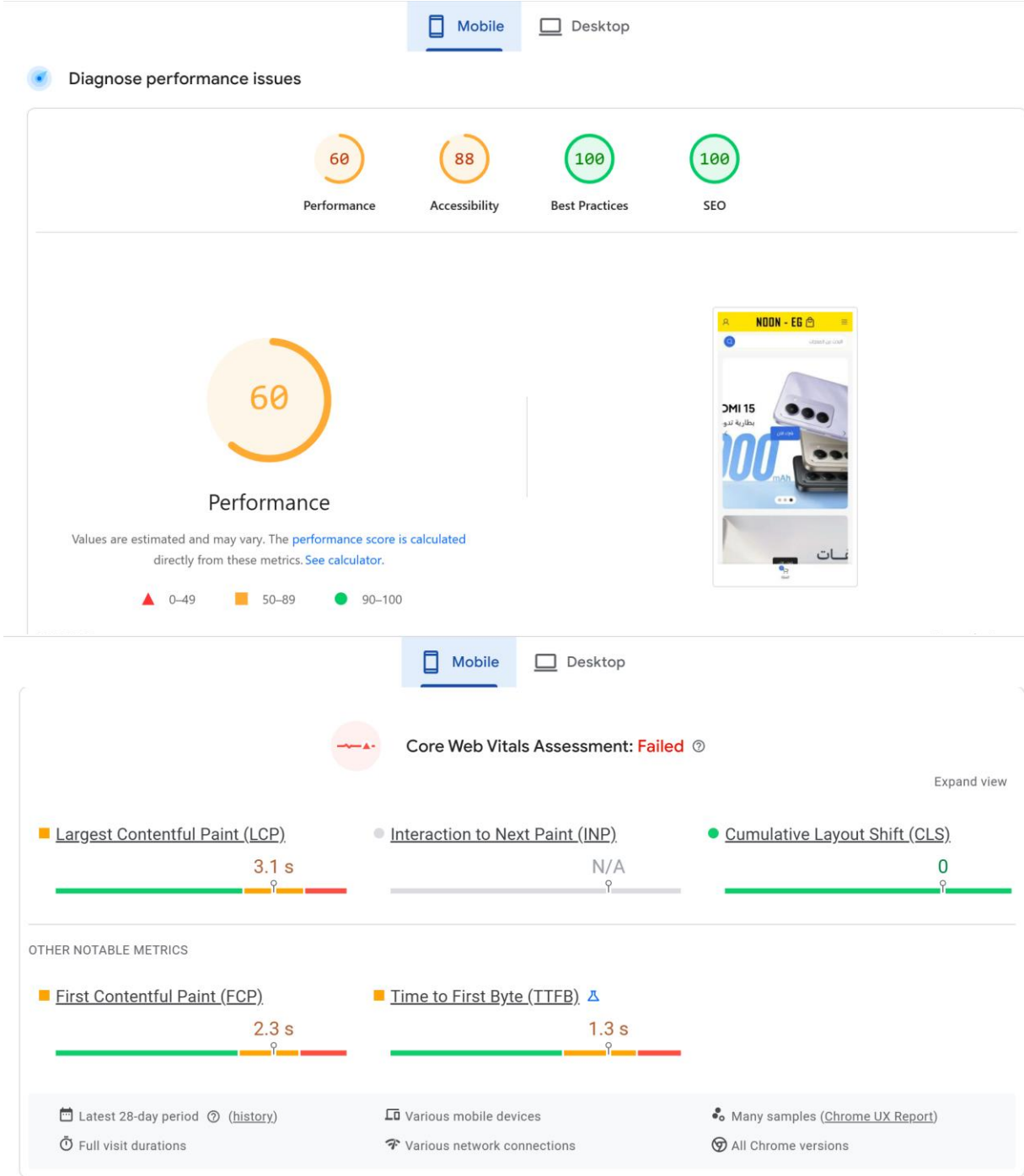


Figure 3: Noon Mobile Performance Overview

3 Comparison Analysis

The comparison of the three websites reveals significant performance differences:

- **1st Place: Noon**

Highest performance score (60), fast LCP/FCP, and perfect CLS.

- **2nd Place: Galala University (GU)**

Moderate results with acceptable Core Web Vitals but slower server response.

- **3rd Place: CNN**

Very poor loading times and heavy resource blocking issues.

Conclusion: These results highlight varying levels of optimization. CNN requires substantial improvements, GU needs moderate frontend and backend optimization, and Noon requires only minor enhancements.

4 Optimization Recommendations

Based on the analysis, the following strategies are recommended (particularly for CNN as the worst performer):

4.1 1. Image Optimization

- Compress large images to reduce file sizes.
- Convert images to next-generation formats such as WebP.
- Apply lazy loading so off-screen images load later.
- Define image width and height to maintain stable layout and reduce rendering delays.

4.2 2. Code Optimization

- Minify CSS and JavaScript to decrease file sizes.
- Remove unused CSS/JS to reduce parsing and execution time.
- Use code splitting so only essential code loads during the initial page view.

4.3 3. Caching Strategy

- Improve browser caching by setting longer cache lifetimes for static assets.
- Deliver images, CSS, and JS through a Content Delivery Network (CDN) for faster global loading.
- Use a service worker to cache key assets and improve repeat-visit performance.

4.4 4. Critical Rendering Path

- Inline critical CSS needed for above-the-fold content.
- Defer or async non-critical JavaScript to avoid blocking rendering.
- Preload important resources such as primary fonts and the main stylesheet.

4.5 5. Content Delivery

- Serve all static assets through a CDN to reduce latency.
- Enable Gzip or Brotli compression to reduce transfer sizes of HTML, CSS, and JS files.

5 Conclusion

The performance evaluation clearly identifies **CNN** as the worst-performing website due to severe delays in loading and heavy script execution. **GU** performs moderately well but still requires optimization, particularly in reducing server response time. **Noon** provides the best mobile experience, with fast loading and excellent layout stability, needing only minor adjustments to further improve its Core Web Vitals.

Applying the recommended optimizations, especially for CNN, will significantly enhance page load speed, responsiveness, and visual stability, ultimately improving user experience and SEO outcomes.

6 Evaluation of Network Requests and Media Loading:

Top Row: Trump's Venezuela showdown

Article: **Trump's Venezuela showdown starts to slip out of his control**

Network Panel Summary: 119 requests, 3.5 MB transferred, 10.3 MB resources, Finish: 2.7 min, DOMContentLoaded: 22 min.

Name	Status	Type	Initiator	Size	Time
index.scr/185A.js	200	script	main.js-Dw1a7DcD.js:1	94.0 kB	6 ms
RC90b6590c63f94982821b76e18aa575...	(pending)	script	launch-2878c87af5e3.m	0.0 kB	Pending
RC4bda299kda84938f90fba24319214a...	(pending)	script	launch-2878c87af5e3.m	0.0 kB	Pending
RC055d142r324bfe96150fca20d8e8e...	(pending)	script	launch-2878c87af5e3.m	0.0 kB	Pending
js.js	200	script	content.js:43	1.4 kB	2 ms
gppongmhkpfhnhagpmfkanvillamg.js	200	script	content.js:43	2.0 kB	3 ms
gppongmhkpfhnhagpmfkanvillamg.js	(blockeddot...)	script	cm-edition-adjuet-bo	0.0 kB	14 ms
script.js	(pending)	script	cm-edition-adjuet-bo	0.0 kB	Pending
cadmus.script.ac/d2uap9jskdp2	(pending)	script	cm-edition-adjuet-bo	0.0 kB	Pending
sigTo=5762268746743808&upapi=true	(blockeddot...)	script	cm-edition-adjuet-bo	0.0 kB	9 ms
blobloader.com	(pending)	script	VM163624	0.0 kB	Pending
alerts	(pending)	fetch	publicapi	0.0 kB	Pending

Middle Row: Influential British politician

Article: **Influential British politician accused of racism**

Network Panel Summary: 119 requests, 3.5 MB transferred, 10.3 MB resources, Finish: 2.7 min, DOMContentLoaded: 22 min.

Name	Status	Type	Initiator	Size	Time
fallback.mpd/manifest-params-prod-2...	200	xhr	boldPlayer1	2.5 kB	193 ms
gcp.live.cnn.eu.prod.media.msc.com/...	201	Created	VM226:24	0.4 kB	329 ms
buy.any-cmea.prod.api.bolt.cnn.com/...	200	fetch	boldPlayer1	1.8 kB	174 ms
avc-sdr-288p-30fps-700kpbs-int.m4	200	xhr	boldPlayer1	1.7 kB	152 ms
gcp.live.cnn.eu.prod.media.msc.com/...	200	xhr	boldPlayer1	275 kB	838 ms
audio-stereo-en-aac54-en-18109.m4	200	xhr	boldPlayer1	26.2 kB	204 ms
gcp.live.cnn.eu.prod.media.msc.com/...	200	xhr	boldPlayer1	26.2 kB	172 ms
ping?l=video%40edition.cnn.com&g=...	200	gif	script.js:1	0.2 kB	176 ms
ping.dambeat.net	200	script	script.js:1	0.0 kB	174 ms
fallback.mpd/manifest-params-prod-2...	200	xhr	boldPlayer1	2.5 kB	197 ms
gcp.live.cnn.eu.prod.media.msc.com/...	200	xhr	boldPlayer1	8.0 kB	195 ms
out053a3beigh70phqao0sou.litico	200	fetch	VM226:24	0.2 kB	191 ms
avc-sdr-450p-30fps-1650kpbs-18110...	(pending)	xhr	boldPlayer1	0.0 kB	Pending
gcp.live.cnn.eu.prod.media.msc.com/...	(pending)	xhr	boldPlayer1	0.0 kB	Pending
audio-stereo-en-aac54-en-18110.m4	(pending)	xhr	boldPlayer1	0.0 kB	Pending
gcp.live.cnn.eu.prod.media.msc.com/...	(pending)	xhr	boldPlayer1	0.0 kB	Pending

Bottom Row: Cookie consent banner

Article: **Our use of cookies and other technologies**

Network Panel Summary: 130 requests, 14.8 MB transferred, 30.6 MB resources, Finish: 2.2 min, DOMContentLoaded: 23.15 s.

Name	Status	Type	Initiator	Size	Time
otTCF.js	200	script	otBannerSdk.js:7	17.7 kB	114 ms
favicon.ico	200	x-icon	Other	6.1 kB	476 ms
bootstrap	200	preflight	Preflight@	0 B	92 ms
bootstrap	200	fetch	boldPlayer1337	4.6 kB	397 ms
otFlat.json	200	fetch	otBannerSdk.js:7	3.7 kB	94 ms
otPcCenter.json	200	fetch	otBannerSdk.js:7	13.6 kB	116 ms
otCommonStyles.css	200	fetch	otBannerSdk.js:7	4.4 kB	94 ms
decisions?projectId=6580c...	200	preflight	Preflight@	0 B	101 ms
decisions?projectId=6580c...	200	fetch	boldPlayer1337	4.3 kB	190 ms
ot_guard_logo.svg	200	fetch	otBannerSdk.js:7	871 B	82 ms
CNN_logo.png	200	png	Other	3.9 kB	86 ms
powered_by_logo.svg	200	svg+xml	Other	2.1 kB	153 ms
1018	(pending)	xhr	boldPlayer1	0 B	Pending
1018	(pending)	preflight	boldPlayer1	0 B	Pending
ui	(pending)	script	js:1	0 B	Pending
out053a3beigh70phqao0sou...	(pending)	fetch	boldPlayer1337	0 B	Pending
sodar?tid=pal&tv=1.0	(pending)	xhr	boldPlayer1	0 B	5.01 s
playbackInfo	(pending)	fetch	boldPlayer1337	0 B	Pending
playbackInfo	200	preflight	Preflight@	0 B	4.28 s

The figure displays three screenshots of the Galala University website, each paired with its respective browser developer tools (Network tab) to analyze network requests. The website URL is <https://www.gu.edu.eg>.

Top Screenshot: The website header features the Galala University logo and navigation links. The main content area highlights "GU Offers Dual Degrees with Arizona State University" and "Ranked among the Top 150 Universities Worldwide". The footer includes "Innovative Educational Model", "Dual Degree Programs", and "Dynamic Campus Life". The developer tools show a list of network requests, including video playback and document requests.

Middle Screenshot: The website header features the Galala University logo and navigation links. The main content area highlights "Setting a New Standard of Higher Education in Egypt". The footer includes "Innovative Educational Model", "Dual Degree Programs", "Dynamic Campus Life", and "International Partnerships". The developer tools show a list of network requests, including image and script requests.

Bottom Screenshot: The website header features the Galala University logo and navigation links. The main content area highlights "Setting a New Standard of Higher Education in Egypt". The footer includes "Innovative Educational Model", "Dual Degree Programs", "Dynamic Campus Life", and "International Partnerships". The developer tools show a list of network requests, including image and script requests.

The figure displays three sequential screenshots of the Noon-EG website, each illustrating a different product category and its associated network performance analysis. The browser window on the left shows the website content, while the Network tab on the right provides detailed metrics for various resources loaded during the session.

Top Screenshot: Laundry Category

The website shows a promotional banner for laundry services with the text "الغسالات" (Washing Machines) and a "شراء الآن" (Buy Now) button. The Network tab shows a list of resources including:

Name	Status	Type	Initiator	Size	Time	Fulfile...
%D8%A7%D9%84%D8%B...	200	webp	Other	17.3 kB	94 ms	
collect	204	xhr	clarity.js:2	275 B	176 ms	
Consoles.webp	200	webp	Other	2.0 kB	139 ms	
Boys-Fashion-600x600.webp	200	webp	Other	33.1 kB	162 ms	
collect	204	xhr	clarity.js:2	275 B	958 ms	
%D8%A7%D9%84%D8%B...	200	webp	Other	10.4 kB	410 ms	
%D8%A7%D9%84%D8%B...	200	webp	Other	8.3 kB	409 ms	
collect	204	xhr	clarity.js:2	275 B	413 ms	
Men-Clothes-600x600.webp	200	webp	Other	19.4 kB	272 ms	
%D8%A3%D8%B2%D9%8...	200	webp	Other	13.2 kB	199 ms	
%D8%A7%D8%B2%D9%8...	200	webp	Other	24.8 kB	180 ms	
collect	204	xhr	clarity.js:2	275 B	1.13 s	
Refrigeration.webp	200	webp	Other	1.3 kB	422 ms	
%D8%A7%D9%84%D8%B...	200	webp	Other	8.1 kB	488 ms	
%D8%A7%D9%84%D8%B...	200	webp	Other	9.3 kB	95 ms	
Laundry.webp	200	webp	Other	2.7 kB	102 ms	
collect	204	xhr	clarity.js:2	275 B	164 ms	
%D8%A7%D9%84%D9%8...	200	webp	Other	21.6 kB	270 ms	
%D8%AA%D9%84%D9%8...	200	webp	Other	49.1 kB	642 ms	

Summary: 223 requests, 1.2 MB transferred, 3.4 MB resources, Finish: 34.96 s, DOMContentLoaded: 1.73 s.

Middle Screenshot: Smartphones Category

The website shows a promotional banner for smartphones with the text "REDMI 15" and "بطارية تدوم لأيام" (Battery lasts for days). The Network tab shows a list of resources including:

Name	Status	Type	Initiator	Size	Time	Fulfile...
collect	204	xhr	clarity.js:2	275 B	1.24 s	
Men-Clothes-600x600.webp	200	webp	Other	19.4 kB	120 ms	
%D8%A3%D8%B2%D9%8...	200	webp	Other	13.2 kB	306 ms	
%D8%A7%D9%84%D8%B...	200	webp	Other	17.3 kB	404 ms	
%D8%A7%D8%B2%D9%8...	200	webp	Other	24.9 kB	264 ms	
collect	204	xhr	clarity.js:2	275 B	1.27 s	
Refrigeration.webp	200	webp	Other	1.3 kB	324 ms	
%D8%A7%D9%84%D8%B...	200	webp	Other	8.1 kB	313 ms	
%D8%A7%D9%84%D8%B...	200	webp	Other	9.3 kB	494 ms	
Laundry.webp	200	webp	Other	2.7 kB	452 ms	
collect	204	xhr	clarity.js:2	275 B	436 ms	
%D8%A7%D9%84%D9%8...	200	webp	Other	21.6 kB	1.19 s	
%D8%AA%D9%84%D9%8...	200	webp	Other	49.1 kB	2.12 s	
collect	204	xhr	clarity.js:2	275 B	3.49 s	
%D9%84%D8%A7%D8%B...	200	webp	Other	28.0 kB	1.40 s	
%D9%85%D8%A7%D9%8...	200	webp	Other	7.2 kB	1.13 s	
collect	204	xhr	clarity.js:2	275 B	634 ms	
collect	204	xhr	clarity.js:2	275 B	902 ms	
collect	204	xhr	clarity.js:2	275 B	1.80 s	

Summary: 265 requests, 2.6 MB transferred, 4.8 MB resources, Finish: 1.3 min, DOMContentLoaded: 8.54 s.

Bottom Screenshot: Xiaomi HyperOS Category

The website shows a promotional banner for Xiaomi HyperOS with the text "REDMI 15" and "بطارية تدوم لأيام" (Battery lasts for days). The Network tab shows a list of resources including:

Name	Status	Type	Initiator	Size	Time	Fulfile...
%D8%A7%D9%84%D8%B...	200	webp	(index):14255	1.7 kB	89 ms	
%D8%A7%D9%84%D8%B...	200	webp	(index):14255	2.5 kB	141 ms	
%D8%A7%D9%84%D8%B...	200	webp	(index):14255	1.1 kB	91 ms	
%D8%A7%D9%84%D8%B...	200	webp	(index):14255	2.2 kB	95 ms	
%D8%A7%D9%84%D8%B...	200	webp	(index):14255	1.8 kB	87 ms	
%D8%B9%D9%84%D8%B...	200	webp	(index):14255	1.8 kB	86 ms	
%D9%85%D9%84%D9%8...	200	webp	(index):14255	2.0 kB	141 ms	
%D8%A7%D9%84%D8%B...	200	webp	(index):14255	1.2 kB	87 ms	
uamln2xa1a7ef=wordpress	400	script	data:text/javascript	123 B	851 ms	
g.gif?v=ext&blog=250691...	200	gif	e-202549.js:1	167 B	79 ms	
956.js?minify=false&ver=4...	200	script	woocommerce-	3.5 kB	654 ms	
admin-ajax.php	200	xhr	jquery.min.js?v=	1.5 kB	759 ms	
shared-front-end-handlers...	200	script	webpack.runtime	3.1 kB	613 ms	
cropped-Noon-Fav-icon-3...	200	webp	Other	1.3 kB	138 ms	
Consoles.webp	200	webp	Other	2.0 kB	145 ms	
Boys-Fashion-600x600.webp	200	webp	Other	33.1 kB	104 ms	
%D8%A7%D9%84%D8%B...	200	webp	Other	17.3 kB	187 ms	
%D8%A7%D9%84%D8%B...	200	webp	Other	10.4 kB	91 ms	
%D8%A7%D9%84%D8%B...	200	webp	Other	8.3 kB	178 ms	

Summary: 204 requests, 1.0 MB transferred, 3.1 MB resources, Finish: 13.19 s, DOMContentLoaded: 1.79 s.