



WEB PROGRAMMING

SECV 2223 (SECTION 01)

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GROUP ASSIGNMENT

COMPARATIVE EVALUATION OF WEBSITES

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1 Introduction on Tech Companies

With the advance of technology and innovation driven by capitalization, our life are inevitably tied to tech products from big companies from all over the world. Under the domain of technology, these companies thrive in different industries ranging from computer hardware, software and programming, semiconductors, to telecommunication service, broadcasting and cable and internet retail. According to Companies Market Cpa, the top 6 largest tech companies by market capitalization are Apple, Microsoft, NVIDIA, Alphabet, Amazon and Meta.

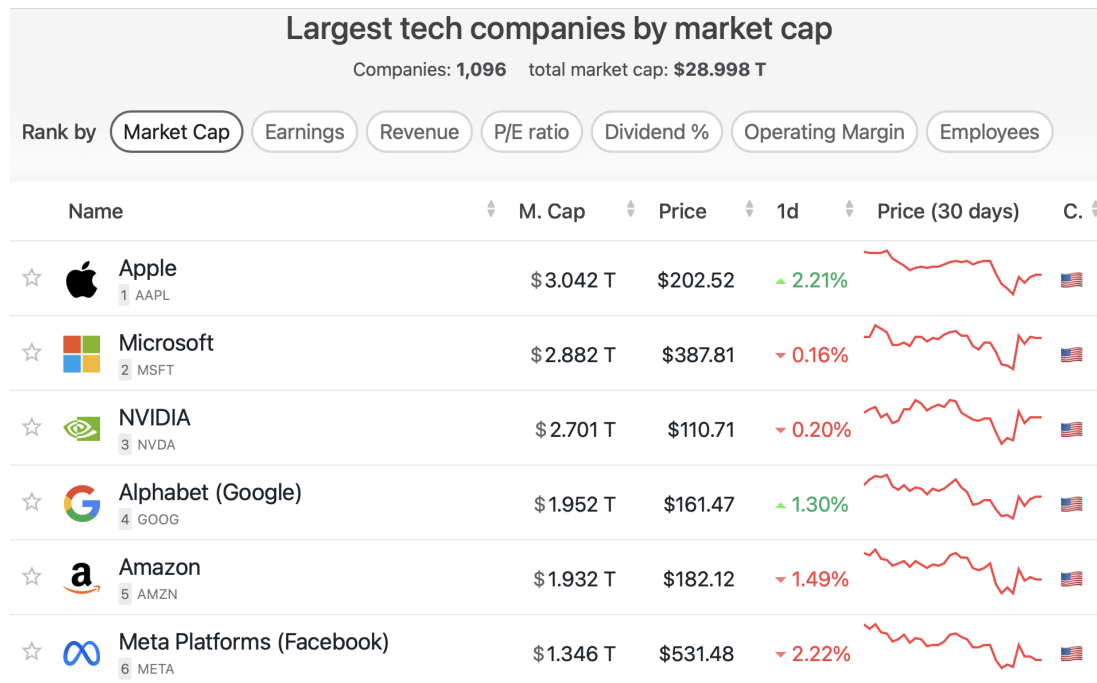


Fig. 1. Largest Tech Companies by Market Cap

To dive deep into the topic of web design, we have visited and conducted evaluation on the websites of these tech companies using performance audit tool such as Google Lighthouse. However, among these top tech companies, we have decided to exclude Alphabet since it is a newly established website as a replacement for Google hence not many features are available for evaluation. Google Lighthouse provides features to audit the websites from different design perspectives such as performance, accessibility and Search Engine Optimization (SEO) and more. The performance report of the websites chosen serve as a study material for developers and for potential improvements of the websites themselves.

2 Literature Review

2.1 Website

A website is a collection of interconnected web pages hosted on a domain or subdomain within the World Wide Web (WWW). Websites serve as digital platforms for accessing content, services, or information, such as Google.com, Facebook.com, and Amazon.com.

The primary purpose of a website is to deliver content efficiently for domains like news, e-commerce, education, or entertainment. They offer global reach and real-time updates, integrating multimedia elements such as text, images, audio, video, and animation to enhance user engagement.

In the digital age, websites have become essential tools for communication, business operations, and online transactions, particularly in e-commerce and cloud services.

2.2 Tech Companies

Technology companies are major drivers of innovation, economic growth, and digital transformation. They shape how we communicate, shop, socialize, and work by developing tech-based products and services.

2.3 Apple

Apple Inc. is a leading tech company known for its iPhones, Macs, and digital services like Apple TV+. It also operates major platforms for music, software, and streaming. As of April 2025, Apple's market capitalization is \$3.042 trillion, making it the world's most valuable company.

2.4 NVIDIA

NVIDIA is a leader in AI and GPU technology, specializing in graphics processing for research, entertainment, and engineering. It follows the fabless model and gained early recognition with its NV1 GPU. As of 2025, it is a dominant force in AI hardware development.

2.5 Microsoft

Microsoft develops and licenses software, devices, and cloud solutions. Known for Windows and Office, it also owns LinkedIn and Bing. Its Azure cloud services are a major revenue stream. As of April 2025, Microsoft's market cap is \$2.882 trillion, ranking second globally.

2.6 Amazon

Amazon.com, Inc. is a global e-commerce giant and cloud service provider. Besides its massive product catalog, it offers devices like Kindle and Echo.

Amazon Marketplace enables third-party sales. In 2019, it reported \$280 billion in sales and remains a key industry leader.

2.7 Meta

Meta Platforms (formerly Facebook) owns Facebook, Instagram, and WhatsApp, and invests in virtual reality through the metaverse. As of April 2025, Meta's market capitalization stands at \$1.346 trillion, ranking 7th globally.

2.8 Google Lighthouse

Lighthouse is an open-source, automated tool for improving web page quality. It audits performance, accessibility, SEO, and more. Suitable for any webpage, it provides detailed insights to enhance user experience and optimize site features.

3 Method

3.1 Overview

This report studies the web performance of five leading technology companies which are Apple, NVIDIA, Microsoft, Amazon, and Meta. The methodology involves auditing each website using the Google Lighthouse extension, which is a tool that generates comprehensive reports on key performance metrics. The primary goal is to examine and compare these websites' technical conditions across four key dimensions which are performance, accessibility, best practices, and search engine optimization (SEO). The method follows a structured, repeatable process to ensure the validity and reliability of findings, which can serve as a model for future web performance audits.

3.2 Research Steps

The research process consists of the following stages:

1. Literature Review:

Compile supporting information from reliable sources to comprehend web performance measurements and best practices.

2. Data Collection:

Visit the target websites (Apple, NVIDIA, Microsoft, Amazon, and Meta) and use the Chrome extension for Google Lighthouse to run audits on the following metrics:

- Performance: Measures loading speed, including render-blocking resources and image optimization.
- Accessibility: Evaluate usability for individuals with disabilities such as screen reader compatibility.
- Best Practices: Checks adherence to current web development standards.
- Search Engine Optimization (SEO): Evaluates search engine optimization.

3. Scoring Criteria:

- 0-49 : Poor and requires improvement.
- 50-89 : Adequate and needs moderate optimization.
- 90-100 : Excellent and meets industry benchmarks.

4. Analysis and Testing

Compare Lighthouse reports across all five websites and identify trends such as common weaknesses in performance and document the findings.

4 Result & Discussion

The results of the Google Lighthouse audit tool's evaluation and testing on the websites of five major tech companies—Apple, NVIDIA, Microsoft, Amazon, and Meta—are shown in this section. Performance, accessibility, best practices, search engine optimization (SEO), and the use of progressive web apps (PWAs) were the five main evaluation criteria.

NO	Tech Companies	Google Lighthouse Analysis Result				
		Performance	Accessibility	Best Practices	Search Engine Optimization	Progressive Web App
1	Apple	74	93	100	92	×
2	NVIDIA	66	92	81	92	×
3	Microsoft	71	96	56	85	×
4	Amazon	83	88	93	100	✓
5	Meta	87	86	78	92	✓

Table 1. Google Lighthouse Audit Summary for Top 5 Tech Companies

Amazon came in second (83), but Meta had the best performance score (87), suggesting excellent speed and responsiveness. Apple received a flawless score of 100 in Best Practices, while Microsoft triumphed in Accessibility with 96. With a perfect score of 100, Amazon was the best performer in SEO. As evidence of their dedication to cutting-edge, installable, and offline-capable web experiences, only Amazon and Meta met the PWA requirements.

Overall, the data indicates that each organisation has different strengths. Some place more emphasis on accessibility or user experience, while others concentrate on speed or cutting-edge web technologies like PWAs.

5 Conclusion

Google Lighthouse was used to analyse the websites of the top five international IT companies. Performance, accessibility, best practices, SEO, and PWA were the five metrics that were used to evaluate each website. The results demonstrate that SEO and best practices both significantly improve user experience and exposure. While Amazon and Meta are the leaders in PWA support and performance, companies like Apple and Microsoft continue to shine in particular domains like coding standards and accessibility.

This study emphasises that a well-rounded website is more than just fast. There is still space for development, particularly in the use of PWA elements to increase functionality and user engagement on all platforms.

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