



TOP COMPANY WEBSITE PERFORMANCE

Defining "Fast" And "Fast Enough" In Your Industry



LEVEL 3 COMMUNICATIONS REPORT
Q4 2011

An organization's overall reputation and the reliability of its products or services are judged from the instant that website is visited.

Summary

General consensus is that most organizations cannot succeed without an online presence. The speed at which websites respond to end user expectations has never been more important. People throughout the globe continue to become more dependent on the Internet to provide them with what they are looking for. Therefore, the online experience they have on a website has become increasingly important.

An organization's overall reputation and the reliability of its products or services are judged from the instant that website is visited, whether it is used to transact e-business, reinforce branding, or support a particular initiative or mission.

Working from the premise that customer experience is directly linked to organizational success, Level 3 conducted research aimed at measuring top company website performance. Our methodology assesses performance from the point of view of customers, who are most likely connecting via DSL. They don't necessarily experience the faster reactive times typical of an office, where large-pipe broadband connectivity is probably the standard.

While the need for high performance is a common denominator, what might vary is the purpose of the site and the associated key performance indicators. E-commerce sites measure revenue, while other sites may track different conversions, whether that is click-throughs, downloads, time-on-site or search engine rankings. The adoption of cloud-based websites and the applications associated with them will also be challenged by the need to create winning user experiences.

In order to collect data from a neutral source, we used the test tool provided at www.webpagetest.org. We have included a link to the tool, so you can validate our method and results. Details on this process are found in the Research Methodology area of this report.

This report includes the results of our research, summarized by market segment. We also make observations on our findings.

“The Federal Government will transform its Information Technology Infrastructure by virtualizing data centers, consolidating data centers and operations, and ultimately adopting a cloud computing business model.” (FY2010 Federal Budget)

Overview

Why is website performance important? Will the performance ever be fast enough? For that matter, what is “fast enough” and what key performance indicators can be used to measure website effectiveness from industry-to-industry?

The primary objective of this report is to measure the performance of individual companies’ websites (specifically, the load time of the site) relative to the top companies in their segment. During our research, we tested the website load times for Fortune 500 enterprises and government agencies. In Figure 1, you can see the results grouped according to 15 industry segments. We have also made observations and drawn conclusions in response to the questions posed above.

Why is performance important?

Given that virtually all organizations use their websites as part of fulfilling their overall objectives, be it commercial or non-commercial, it’s safe to say the quality of the experience that users have when on a website correlates to the level of success the organization achieves. According to Strangeloop, a company specializing in website performance acceleration, the average online shopper currently expects a website to load in just 2 seconds, and conversion rates can drop more than 30 percent when a landing page takes more than 5 seconds to load. Strangeloop also states that for each second of delay in page load time, page views drop 11 percent and — most significantly — customer satisfaction decreases 16 percent.¹

We also took government agencies into consideration during our research. Although an agency might have no competitor *per se*, it still needs to deliver an experience that satisfies constituents. As the U.S. government continues to transition to more economical, web-based interaction, success behind these initiatives will be gauged by user experience and how many people were able to get the information they needed or provide information required. Performance-based funding naturally follows; agencies will be challenged to use the web to meet their performance goals.

One of the problems both organizations and government agencies face is the website performance trade-off inherent in using engaging content and robust applications, which create stickiness and utility but also greater demand on the host server.

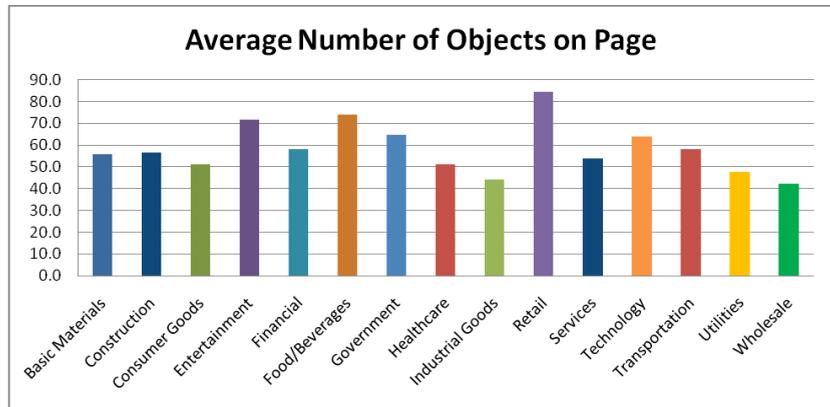


Figure 1. Websites for retail, entertainment and food/beverage businesses incorporate more objects, as these organizations rely more on rich content to compel conversions.

Primarily a visual medium, “the average webpage references 81 external resources, and 64% of these are images. The dominance of images on web pages is growing. In the last 6 months, total page content size increased by 70kB. 75% of that increase (52kB) came from images.”² The issue is that page delivery architecture has not evolved quickly enough to accommodate the increase in objects.

Evolving web application development technologies (Ajax, Microsoft® SharePoint® and many others) continue to place heavy demand on processors; the advantages that these tools provide are welcome, but the accompanying performance degradation obviously is not. Website optimization approaches frequently are applied to source code to soften the impact, although other methods, for example archiving objects as close as possible to an online visitor’s location in content delivery networks (CDNs), can be used to cache called-for objects “closer to the eyeballs.”

During our research, we found that five out of the 30 slowest-loading websites did not use a CDN. As seen in Figure 1, we also found that organizations relying on a large amount of visually engaging, rich content to promote their products load their pages with more than 70 objects on average.

Creating a superior user experience is the goal driving content delivery and code optimization, and a superior experience is primarily dependent on speed. User experience has influenced the evolution of site design. Very few sites today first show you a splash page, which once was a hallmark of cutting-edge web design. Businesses soon realized that splash pages were slick, but what users really wanted was to quickly get to the information that they cared about.

More and more, what online visitors want today is high-quality, engaging content. Video, for example, is one type of content that is garnering attention. In fact, 59 percent of influencers and decision makers used videos in their due diligence when evaluating technology providers.³

What is “fast enough?”

It’s clear that performance demands rise year after year, and the varying device platforms that websites can be delivered to and the technologies on these platforms change. We suggest that the final benchmark for speed is the performance that an application running on your desktop computer exhibits. We believe that you would be hard pressed to find faster performance than what you experience when running an application locally. And as most of us will have to admit, even short instances of an application “freezing” are aggravating to the point where we start clicking multiple times on an unresponsive interface.

What this points to is that the experience we have when running popular software applications on fast devices, such as our laptops, is the standard. Gomez, an online performance monitoring service, contends that “one of the biggest inhibitors to the widespread use of cloud-based applications is user frustration due to poor application performance.”⁴ Rich content and applications that are delivered through a cloud-hosted website are subject to the same user expectations that server-hosted, CDN-enabled sites face.



Hear from Strangeloop CBO Joshua Bixby on the importance of the customer experience.

[Watch Video](#)

Test Your Site! Want to measure your website performance?

Go to WebPagetest.org to run the same tests that we have.

[Go to site](#)

Utilizing performance-enhancing tools can affect the experience you deliver.

What is the performance benchmark for a given industry?

Key performance indicators vary from business to business. An online visitor behaving in accord with a website's purpose (a "conversion") could be buying something, downloading information or simply exploring the site for more details on a given company or their products.

In this report, you will find that we summarized individual company load time results into industry averages, so you can compare your site against the industry average.

Research Methodology

The first step in gathering data for this report was to create a list of companies that we believe represent the global market and a cross-section of significant industries. We chose Fortune Magazine's annual Fortune 500 list as an accurate source.⁵ Then, we defined 15 industry segments, based on the root industries of the companies. These are:

- | | |
|---------------------|---------------------|
| 1. Basic Materials | 9. Industrial Goods |
| 2. Construction | 10. Retail |
| 3. Consumer Goods | 11. Services |
| 4. Entertainment | 12. Technology |
| 5. Financial | 13. Transportation |
| 6. Food & Beverages | 14. Utilities |
| 7. Government | 15. Wholesale |
| 8. Healthcare | |

How was the data gathered?

Each of the Fortune 500 URLs was fed into the test tool on the WebPagetest.org site. There are several options for running tests. One can select different browsers, connection speeds and test locations. A variety of advanced testing and reporting is available, but we decided we would focus simply on speed, as that metric is the key performance criterion for this report.

The web page test settings were:

- Internet Explorer 8 (58.41 percent of browsers in use globally⁶)
- Dulles, VA
- DSL connection: 1.5 Mbps 384 Kbps 50 ms RTT
- Number of runs = 9 (average)
- Empty cache

In addition to evaluating a single web site, you can do a test that shows how utilizing performance-enhancing tools can affect the experience you deliver.

Level 3 has built a tool that demonstrates the potential decrease in load time that your site could achieve by employing our Total Site Performance solution.

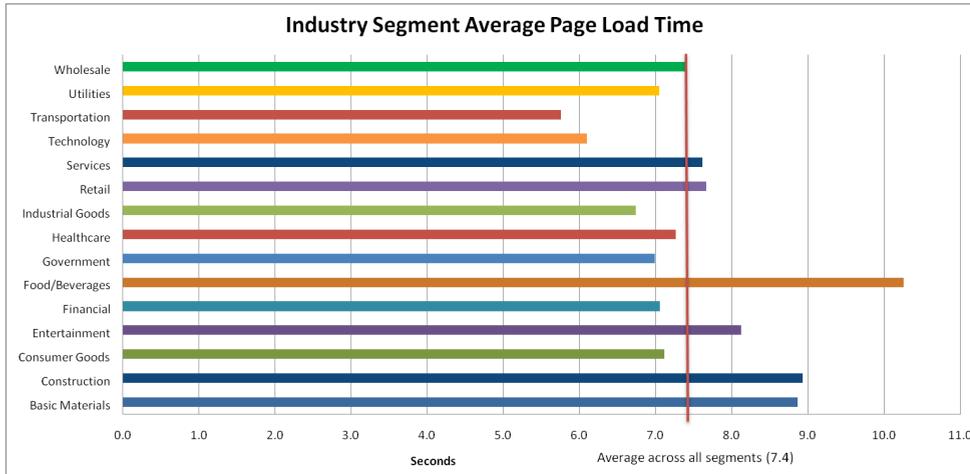


Figure 2. Websites for retail, entertainment and food/beverage businesses incorporate more objects, as these organizations rely more on rich content to compel conversions.

Results

The results show that, across all industries, site load times fall into a window of 6 to 9 seconds. Some companies have load times as fast as 1 second and others as long as 13.5 seconds, as you can see in Figure 2 below.

- | | | |
|-------------------------------|---------------------------------|-------------------------------|
| 1. Basic Materials – 8.9 sec. | 6. Food & Beverages – 10.3 sec. | 11. Services – 7.6 sec. |
| 2. Construction – 8.9 sec. | 7. Government – 7.0 sec. | 12. Technology – 6.1 sec. |
| 3. Consumer Goods – 7.1 sec. | 8. Healthcare – 7.3 sec. | 13. Transportation – 5.8 sec. |
| 4. Entertainment – 8.1 sec. | 9. Industrial Goods – 6.7 sec. | 14. Utilities – 7.1 sec. |
| 5. Financial – 7.1 sec. | 10. Retail – 7.7 sec. | 15. Wholesale – 7.4 sec. |

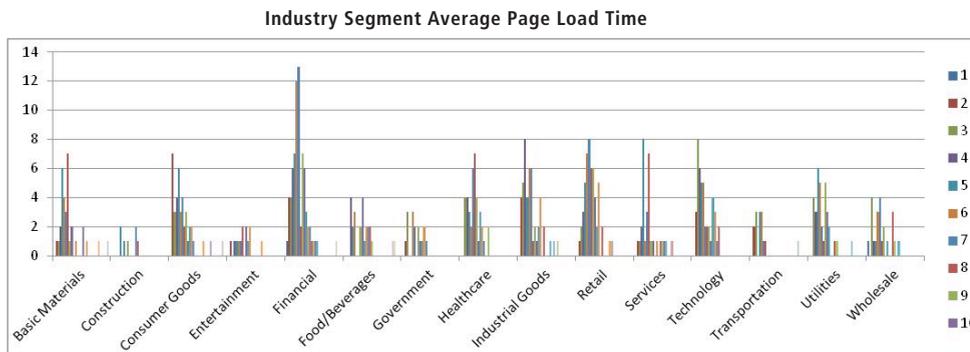


Figure 2. Industry segment average page load time. Note that the overall industry average is 7.4 seconds.

Observations and Recommendations

Considering all that goes into running an enterprise or agency, it can be difficult to justify allocation of financial and human resources to optimize website performance. Below are some key observations and recommendations that we think can help make a sound business case:

- The performance of your website significantly influences visitors' experiences. The faster your site loads and the faster the opportunity to interact with it, the better. There are technologies that can be leveraged that can help optimize the web technologies used for deliveries across a wide-array of devices.
- "What is fast enough?" We believe that, eventually, the only acceptable speed will be "instantaneous." Navigating a website will be the same as operating an application running locally; if not, visitors' negative experiences will impact conversions.
- Cloud computing adoption will in part parallel technology advancements that improve cloud-based application performance. In addition, cloud adoption by federal agencies will be driven by executive mandate in an effort to improve government service delivery.
- Sites that do not take advantage of CDN technology are slower. Using a CDN optimizes the delivery of the website, resulting in decreased latency. CDN performance itself can also be optimized, further speeding performance.
- The technologies that websites are built upon, and the device platforms they can be delivered to, are vast and continue to grow and evolve. Each of these technologies and platforms implement different techniques and approaches that can be leveraged to help improve website performance. This results in the need to have a number of experts in-house who have in-depth knowledge of all these environments.
- Your site can offer a wealth of information on your customers, but only when they are actually on your site. If it takes too long to load and they abandon it, you lose a great opportunity to better understand them.
- Video is a great tool for engaging online visitors but the file size can slow performance, and jittery playback might be worse for your reputation than no video at all.

1. "Solutions / Goal: Increase Ecommerce Revenue," Strangeloop Networks, <http://www.strangeloopnetworks.com/solutions/ecommerce-conversion/>. Original data provided by Aberdeen Group.

2. Billy Hoffman, "Overlooked Optimizations: Images," phpied.com (Blog), <http://www.phpied.com/overlooked-optimizations-images>.

3. "The Eccolo Media 2011 B2B Technology Collateral Survey Report," Eccolo Media, Inc., October 2011, www.eccolomedia.com.

4. "Cloud Monitoring: Don't Blindly Trust the Cloud," Compuware, November 2011, <http://www.compuware.com/application-performance-management/dont-blindly-trust-the-cloud.html>.

5. "And the winners are...", Fortune, May 23, 2011, <http://money.cnn.com/magazines/fortune/fortune500/2011/>

6. "Internet Explorer 8 Use Up but Overall IE's Down," Datamation, December 1, 2010, <http://itmanagement.earthweb.com/entdev/article.php/3915256/Internet-Explorer-8-Use-Up-but-Overall-IEs-Down.htm>.



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