Intro:

(background)Web applications are becoming more and more popular among developers(elaborate).

* Introduction of the idea of user experience and responsive web design.
* Emergence of new, easy web development frameworks.
* Developers often research shallow in framework-specific optimization strategies

(motivation)Figure A shows the time users are willing to spend waiting for a web page to load. According to surveys conducted by Akamai and Gomez.com, 40 percent of the users who go to a website will abandon it if page load time exceeds three seconds.

(Gardner, B. S. (2011). Responsive web design: Enriching the user experience. *Sigma Journal: Inside the Digital Ecosystem*, *11*(1), 13-19.)

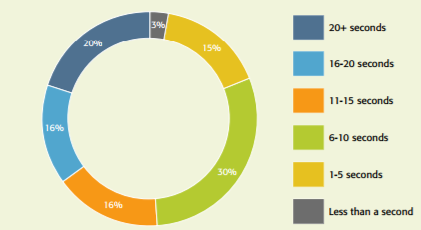


Figure A. Correlating page load time and user patience. Most users will wait only 6 to 10 seconds for a site to load. (Data from <http://blog.kissmetrics.com/loading-time>.)

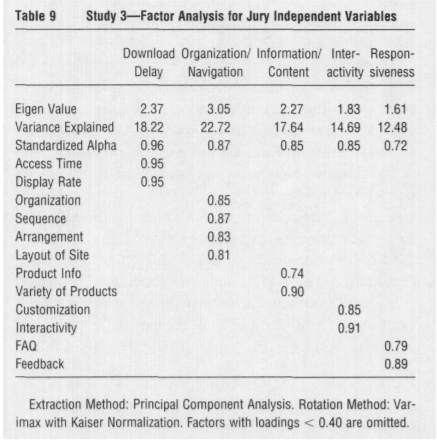
According to study, download delay is one crucial aspect of a web site’s success(Jonathan W.Palmer, 2002).

History of a Webpage’s Usability and Design

Usability of information systems was equivalent to a set of design principles, and one of the five key elements is response time (download delay), which focuses on the speed with which the system provided a response to user activity(Nielsen, 1993).

Studies Around Usability and Design Matrices:

Three studies were conducted to research the importances of the five elements and download delay were one of the most crucial factors of a website’s usability according to regression analysis, as the alpha-value is almost 1.

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How?

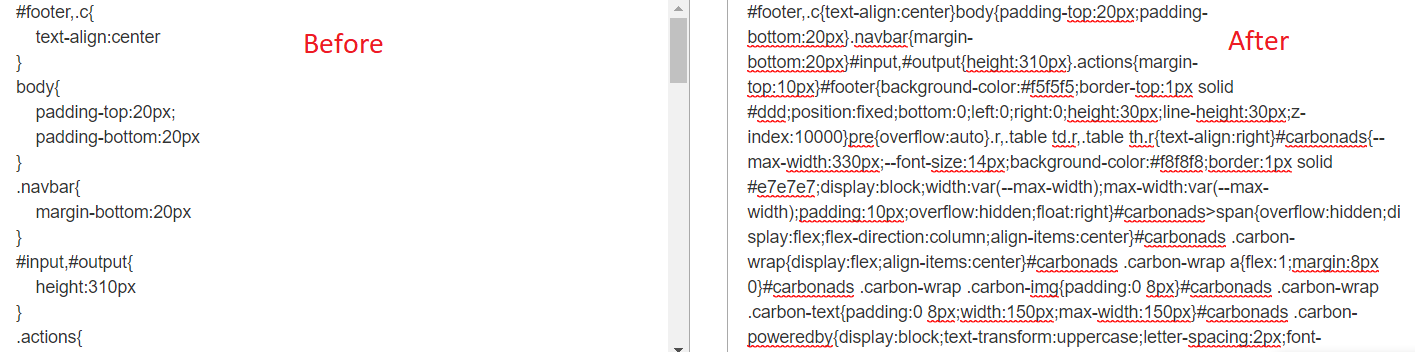
1. Reduce page/file loading speed by reducing size of resource files.

When we develop our websites we often try to make it more human readable by writing a lot of comments, leaving white space and naming the variables with longer and better understandable names for human.

Removing all unnecessary spaces, comments and break will reduce the size of your HTML and speed up your site's page load times and obviously lighten the download for your user. The word ‘Minifying’ stands for this process.

Using minification we can also reduce the bandwidth consumption, what results in smaller energy consumptions for the servers and in the long-term scale it will reflect in smaller running costs.

MINÁRIK, Daniel. *Accelerated Mobile Pages*. Diss. Masarykova univerzita, Fakulta informatiky, 2017.



1. Place css tags before javascript tags - Having your CSS tags before any JavaScript enables better, parallel download which speed up browser rendering time.
2. Minimize the number of iframes
3. CSS files need to be non-blocking to prevent the DOM from taking time to load.CSS files can block the page load and delay the rendering of your page. Using preload can actually load the CSS files before the browser starts showing the content of the page