Usability of Web Browsers

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Abstract

This study is in response to the escalating competitive nature of the modern technology market. Usability is an ever growing factor in the success of software, necessitating usability tests. This paper presents comparative empirical evaluations involving two competing web browsers: Safari and Opera. Test participants were given three tasks to perform twice on each web browser. The results of this evaluation include (a) testing factors during the study, (b) quantitative data collected during testing, and (c) usability metrics measured. This paper incorporates the data gathered into a heuristic evaluation of each web browser.

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1 Introduction

When Apple unveiled the Safari web browser back in 2003, it was advertised as the fastest web browser for the Macintosh and including a multitude of innovative features, such as a bookmark library. Originally exclusive to Apple computers, Safari later became available in 2007 for Windows until it was discontinued in 2012. Though not currently the most popular browser, it is currently the default web browser on iOS and OS X, with approximately 16% of individuals globally using it as their preferred browser. Preceding Safari, Opera was originally a research project by Telenor until it became its own entity and publicly released in 1995. Users originally had to purchase Opera, until it moved to an advertisement based system which lasted from 2000 to 2005. Since its release, less than 5% of web browser users worldwide used Opera as their preferred web browser, making it a relatively unpopular browser. While Safari is noticeably more widely used than Opera, they are comparable in terms of features.

Though neither browser is currently the most popular, it is still important to address the usability of each since Safari and Opera are still widely used worldwide. This study uses empirically examines the usability of each web browser. Within the Interaction Design field, usability is based on five distinct metrics: learnability, efficiency, errors, memorability, and satisfaction. This study will primarily focus on learnability, efficiency, and errors.

2 Testing Factors

Before each test subject performed the assigned tasks, users were asked how much experience they had in using each web browser. Finding test subjects who had little to no prior experience with both web browsers was relatively simple. Since this study focused on both learnability and efficiency, we tested subjects when they were inexperienced with both browsers and again when they had ample experience performing the tasks.

3 Testing Procedures

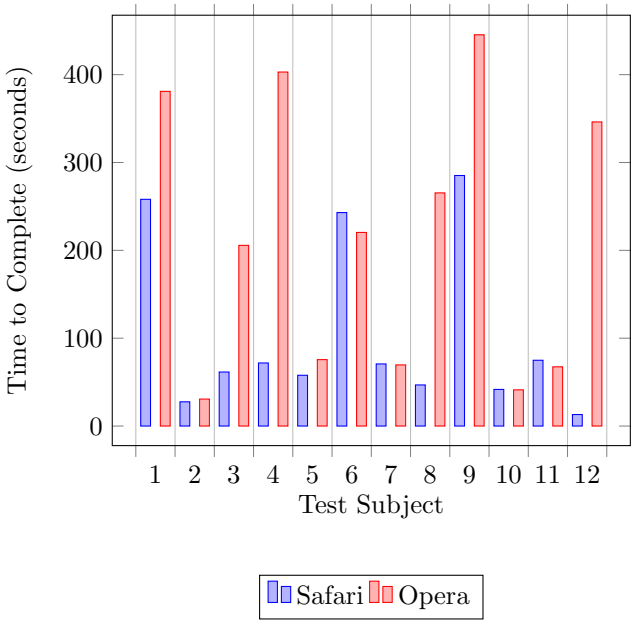
Each test subject performed three distinct tasks on each browser. They were tested when they had little to no experience to the browser, allowed to practice performing the tasks, then tested again once they felt comfortable performing the tasks.

1. Change the home page of the web browser.
2. Bookmark a webpage.
3. Use the history to find and access a webpage visited the previous day.

To keep the testing controlled, each subject was tested on a computer running OS X. As study participants performed each task, information regarding their learnability, efficiency, and errors were collected.

3.1 Learnability

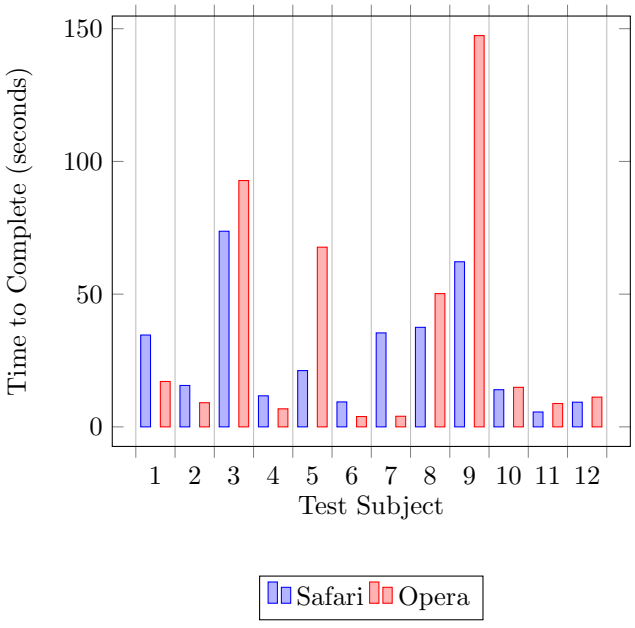
First Task: Change the home page of the web browser.



Average time for Learnability task #1 on Safari: *104.4 seconds*
Average time for Learnability task #1 on Opera: *212.6 seconds*

The results of this task indicate that on average, it is significantly easier to learn how to change the home page in Safari.

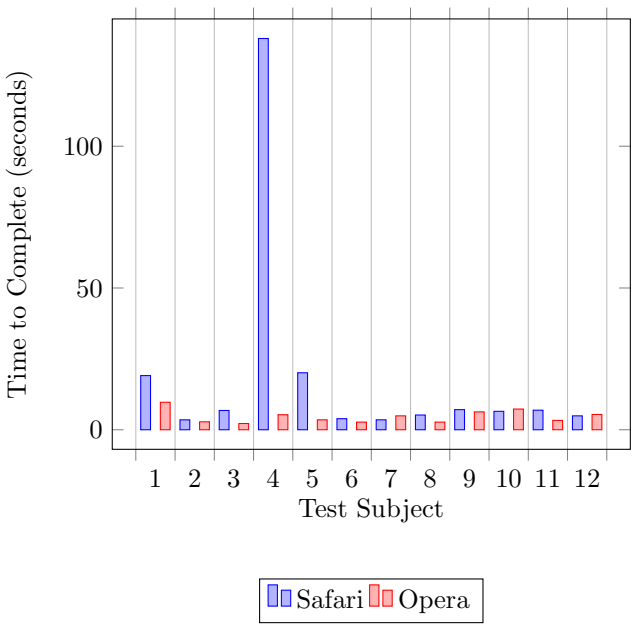
Second Task: Bookmark a webpage.



Average time for Learnability task #2 on Safari: *27.5 seconds*
Average time for Learnability task #2 on Opera: *36.2 seconds*

The results of this task indicate that on average, it is easier to learn how to bookmark a page in Safari.

Third Task: Use the history to find and access a webpage visited the previous day.

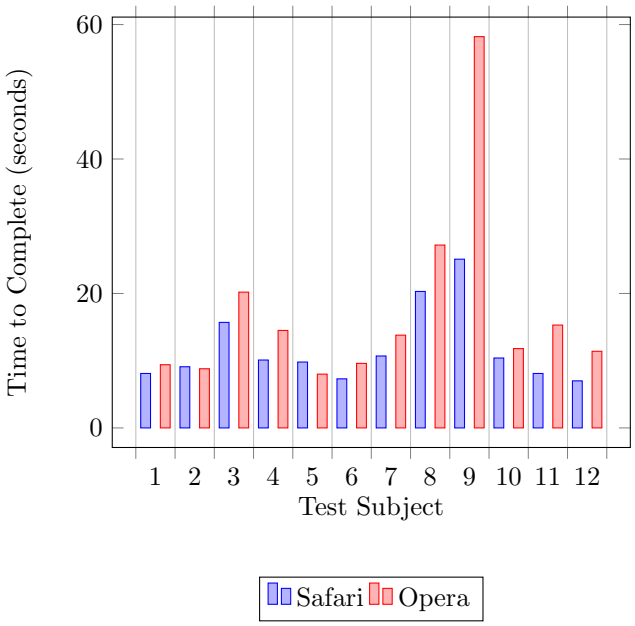


Average time for Learnability task #3 on Safari: *18.8 seconds*
Average time for Learnability task #3 on Opera: *5.3 seconds*

The results of this task indicate that typically, it is slightly easier to learn how to access the histoey in Opera.

3.2 Efficiency

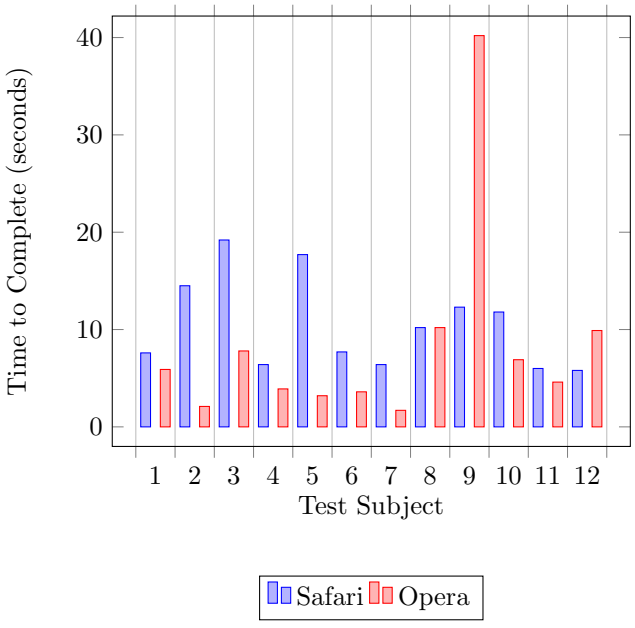
First Task: Change the home page of the web browser.



Average time for Efficiency task #1 on Safari: *11.8 seconds*
Average time for Efficiency task #1 on Opera: *17.4 seconds*

The results of this task indicate that on average, users are more efficient at changing Safari's home page.

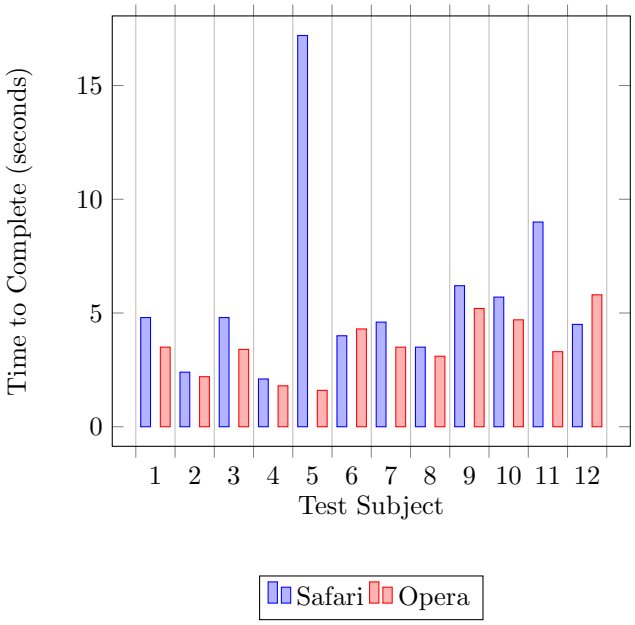
Second Task: Bookmark a webpage.



Average time for Efficiency task #2 on Safari: *10.5 seconds*
Average time for Efficiency task #2 on Opera: *8.3 seconds*

The results of this task indicate that on average, users are more efficient at bookmarking webpages in Opera.

Third Task: Use the history to find and access a webpage visited the previous day.



Average time for Efficiency task #3 on Safari: *5.7 seconds*
Average time for Efficiency task #3 on Opera: *3.5 seconds*

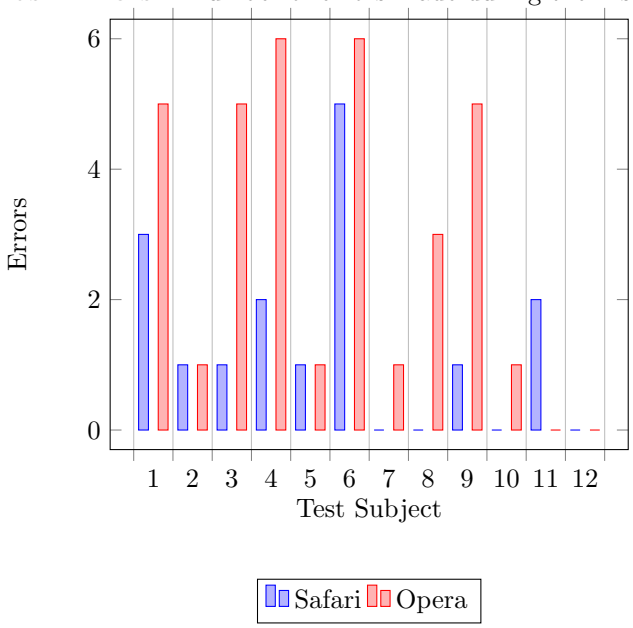
The results of this task indicate that on average, users are more efficient at accessing the browsing history in Opera

3.3 Errors

The errors recorded during this study are as defined by Interaction Design conventions: instances where the user performs an action that results in an unexpected consequence. The following table provides some examples of errors common among study participants.

Task	Browser	Error
Task1	Opera	Click button to add page to top sites instead of make homepage
Task1	Safari	Click top sites button trying to access options
Task2	Safari	Click the bookmarks / reading list button instead of adding bookmark

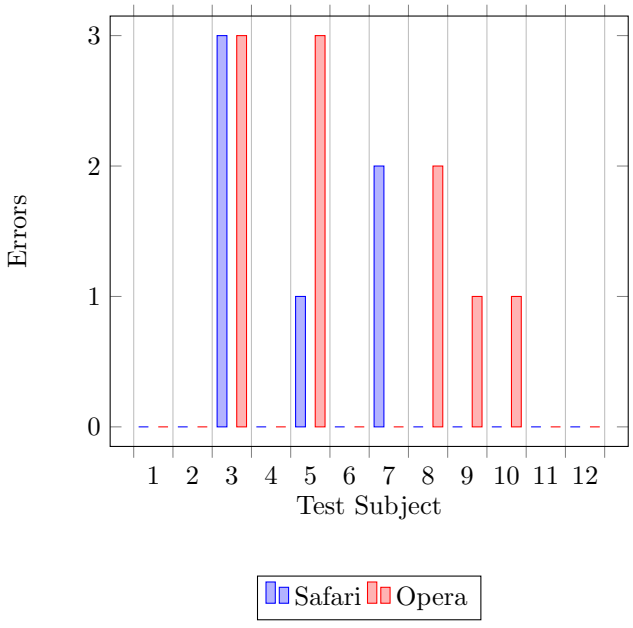
First Task Errors: Number of errors made during the first task.



Average number of errors for task #1 *1.3 errors*
Average number of errors for task #1 *2.8 errors*

The results of this task indicate that users are less inclined to commit errors in Safari.

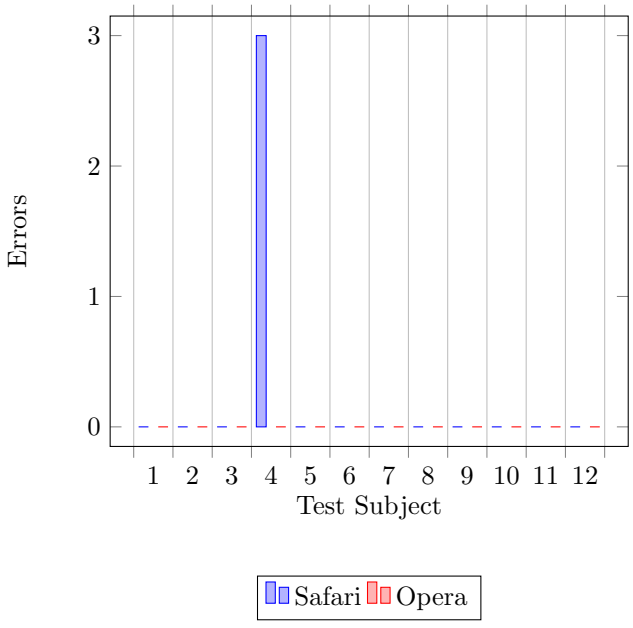
Second Task Errors: Number of errors made during the second task.



Average number of errors for task #1 *0.5 errors*
Average number of errors for task #1 *0.8 errors*

The results of this task indicate that users are slightly less inclined to commit errors in Safari.

Third Task Errors: Number of errors made during the second task.



Average number of errors for task #1 *0.25 errors*
Average number of errors for task #1 *0 errors*

The results of this task indicate that, aside from outliers, users are unlikely to commit errors when accessing history.