

THE INFLUENCE OF OPERATION IMPRESSION AND INFORMATION SEEKING ON WEB LAYOUT

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ABSTRACT

This paper discusses how a website's layout may affect a user's operation impression, and the length of time it takes a user to seek out information on a site. In recent years, different layouts have been used in an attempt to differentiate themselves from other websites. This phenomenon is making initial navigation of websites difficult for the first time visitors to these sites. Therefore, we hypothesized that the root cause of the above-mentioned issue lies in the difference between the user friendly layouts actually in use versus layouts that users think are easy to navigate. More specifically, multiple layouts were presented to the participants, and the operation impression and the time it took users to seek out information were measured for each layout. Using the obtained data, relationships between the searching characteristics of the users and the layout suitable for those characteristics were sought in order to contribute to navigation-friendly layout designs.

Keywords: *Web design, Web navigation, Layout, Usability*

1. INTRODUCTION

This paper discusses how a website's layout may affect a user's operation impression, and the length of time it takes a user to seek out information on a site.

Current layout can largely be divided into contents and navigation menu. The term *contents* refers to the information provided on a page, and the term *navigation* refers to a guide that helps users to reach the desired information within a website [1]. Appropriately combining the site contents and navigation menu leads to an improved legibility and reduced time for information seeking, and thus it is a critical factor for a website.

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In recent years, different layouts have been used in an attempt to differentiate themselves from other websites. This phenomenon is making initial navigation of websites difficult for the first time visitors to these sites. Numerous studies have been conducted on layouts themselves [2][3][4], but not many have investigated layouts through consideration of the contents and navigation menu.

Therefore, we hypothesized that the root cause of the above-mentioned issue lies in the difference between the user friendly layouts actually in use versus layouts that users think are easy to navigate. More specifically, multiple layouts were presented to the participants, and the operation impression and the time it took users to seek out information were measured for each layout. Using the obtained data, relationships between the searching characteristics of the users and the layout suitable for those characteristics were sought in order to contribute to navigation-friendly layout designs.

2. EXPERIMENT DESIGN

2.1. Summary of the Experiment

The purpose of the experiment was to decipher the differences between the impression held by the users after looking at websites and the impression held by the users after actually navigating the websites using a 2-stage experiment. Here, we discuss our hypothesis. It is plausible that the users may hold a positive impression on websites that have layouts similar to the websites they visit often. Therefore, we will examine the Internet surfing habits of the users and consider them in the research.

Experiment 1 asked for the visual impression of web page layouts, and Experiment 2 asked the users to search information, and measured the time it took them, and the users' impression of the usability of the websites.

2.2. Experiment 1: Impression Evaluation of the Layouts

The impressions of the users on web page layouts were examined in this experiment.

The participants were shown different websites with 4 different layouts, and then they were asked to evaluate them. After that, the participants were given a questionnaire.

2.2.1. Websites for Evaluation

For this experiment, we used 4 simple layouts that consisted of contents and navigation menu.

- Site A: The navigation menu is placed in the center of the page "center navigation"
- Site B: The navigation menu is placed in the right side of the page "right axis navigation"
- Site C: The navigation menu is placed in the left side of the page "left axis navigation"
- Site D: The navigation menu is placed on the top of the page "top navigation"

The websites used for the experiment were gathered randomly from the Internet. We not only chose websites that fit the above-mentioned criteria, but we chose websites that do not change layouts as the users navigate throughout the sites.

2.2.2. Evaluation Items

A prior research on website usability evaluation [5] was used as a reference for evaluating by user impression. The SD method with 7-step scoring was used, as shown in Table 1.

2.2.3. Participants

Twenty-one students from the Faculty of Informatics, who use personal computers on a regular basis, participated in the experiment (11 male students and 10 female students).

2.2.4. Questionnaire

We asked the following 2 questions in the questionnaire.

1. What's your favorite site?

2. Select 1 from the 4 websites shown to you in this experiment that has a similar layout to the website that is set as your browser's home page.

Table 1: Evaluation Items for Experiment 1

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree	
Content (information) is thin and light	1	2	3	4	5	6	7	Content (information) is abundant
Content (information) is difficult to view	1	2	3	4	5	6	7	Content (information) is easy to view
Content classification is difficult to understand	1	2	3	4	5	6	7	Content classification is easy to understand
unfamiliar	1	2	3	4	5	6	7	familiar
Don't like this website	1	2	3	4	5	6	7	Like this website
This website is old	1	2	3	4	5	6	7	This website is new

2.3. Experiment 2: Impression Evaluation Using a Task

We investigated the operational impression and the time it took the users to search for information from the websites using tasks (given).

We showed 20 sites to the participants, and asked the participants to search for information in these sites. Upon completion of the search, we asked for the impression of the websites. We measured the amount of time it took the participants to seek out the desired information.

2.3.1. Websites for Evaluation

We based our experiment on 20 websites, based on the 4 layouts used in Experiment 1 (4 layout x 5). The websites were chosen randomly from the Internet, but they were checked against criteria to ensure that the layouts do not change as the users navigate through the sites.

2.3.2. Task

The task was to navigate away from the starting page using the navigation menu, and it was deemed completed when the users clicked on the desired information. We avoided using the text strings within a page, to ensure that the task did not become searching through text strings by reading them.

2.3.3. Evaluation Items

In addition to the evaluation criteria used in Experiment 1, we employed the evaluation criteria of navigation used in a prior research [5].

2.3.4. Participants

The participants were the same 21 students from the Faculty of Informatics who participated in Experiment 1.

Table 2: Evaluation Items for Experiment 2

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree	
Content (information) is thin and light	1	2	3	4	5	6	7	Content (information) is abundant
Content (information) is difficult to view	1	2	3	4	5	6	7	Content (information) is easy to view
Content classification is difficult to understand	1	2	3	4	5	6	7	Content classification is easy to understand
unfamiliar	1	2	3	4	5	6	7	familiar
Don' t like this website	1	2	3	4	5	6	7	Like this website
This website is old	1	2	3	4	5	6	7	This website is new
Navigation of this website is not easy to understand	1	2	3	4	5	6	7	Navigation of this website is easy to understand
The desired information is difficult to find	1	2	3	4	5	6	7	The desired information is easy to find
Don' t know what to do next	1	2	3	4	5	6	7	What to do next is obvious

3. RESULT

Table 3 shows the answers from the questionnaire from Experiment 1, which asked about the participants' web browser's home page and its similarity to one of the websites shown to them in the experiment.

Table 3: Similar websites selected by the participants.

Web site	Number of person
Site A (center navigation)	0
Site B (right axis navigation)	4
Site C (left axis navigation)	12
Site D (top navigation)	5

Figure 1 shows the scores for the 6 evaluation criteria for the layouts, which are the average of the evaluation results of the SD method of Experiment 1. Figures 2 - 4 show the evaluation results for each user based on the results obtained in Table 3.

Similarly, Figures 5 - 8 show the comparison of the scores of the 9 evaluation criteria, which are the average of the evaluation results from Experiment 2.

The results of the search time of Experiment 2 were averaged for each layout and they are shown in Figure 9 for each participant.

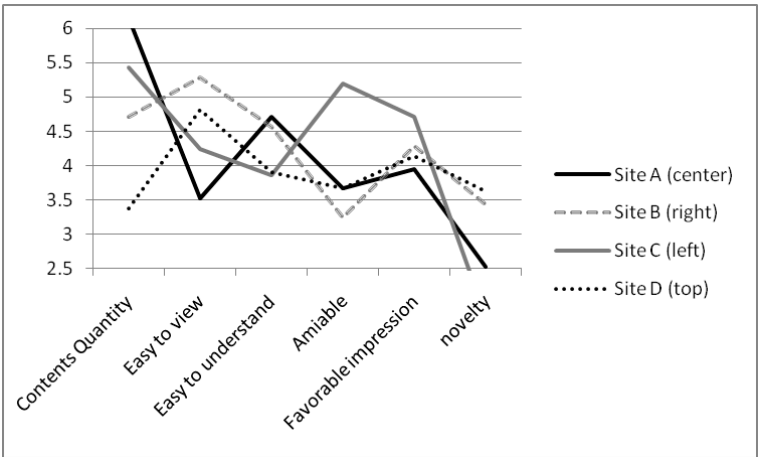


Figure 1: Experiment 1, overall average

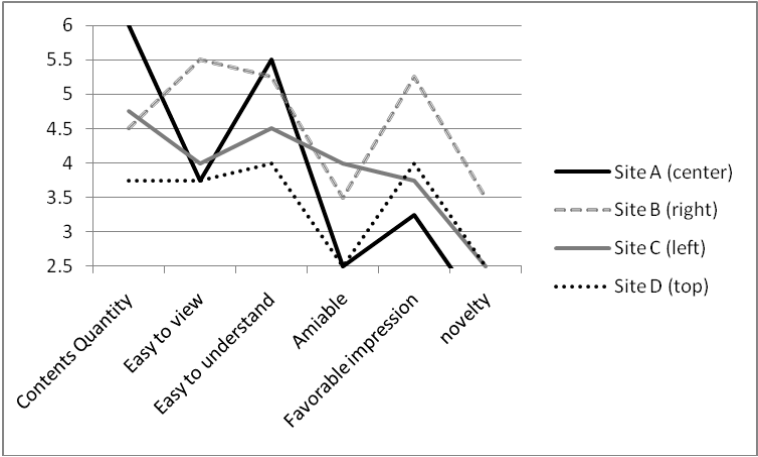


Figure 2: Experiment 1, site B(right), user average

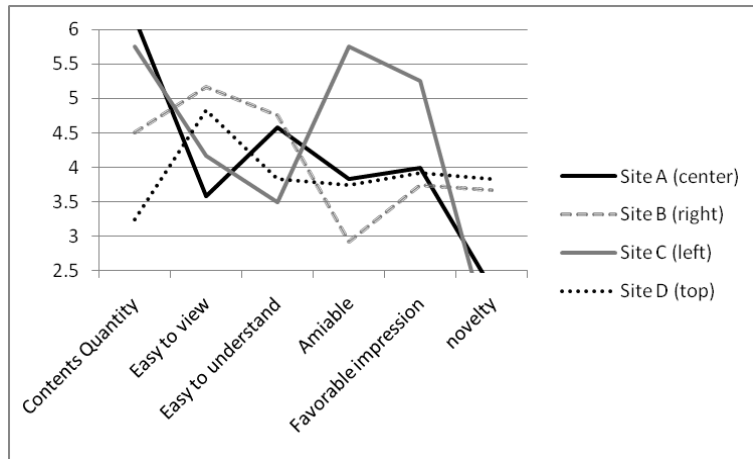


Figure 3: Experiment 1, site C(left), user average

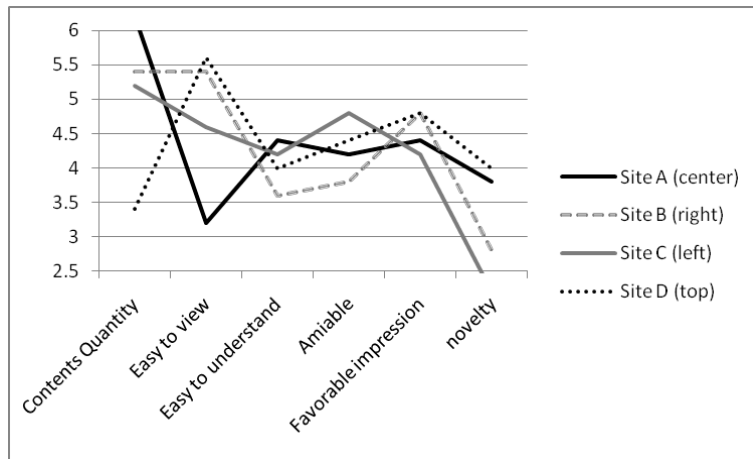


Figure 4: Experiment 1, site D(top), user average

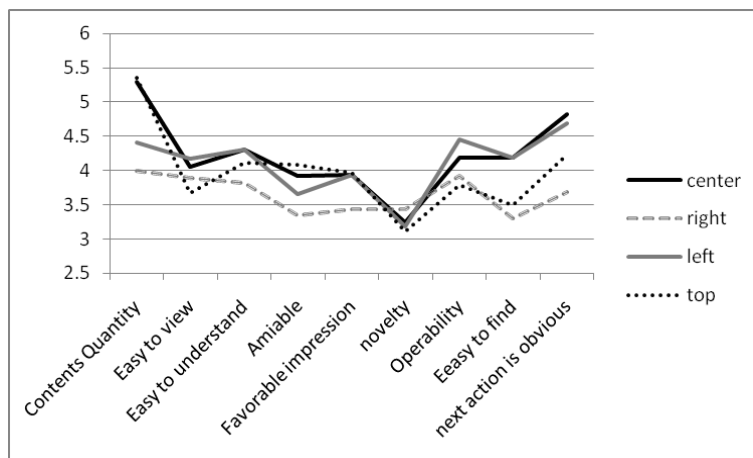


Figure 5: Experiment 2, overall average

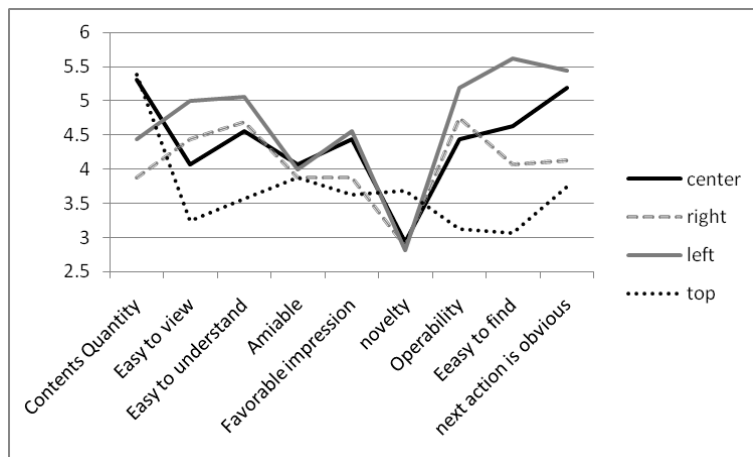


Figure 6: Experiment 2, site B(right), user average

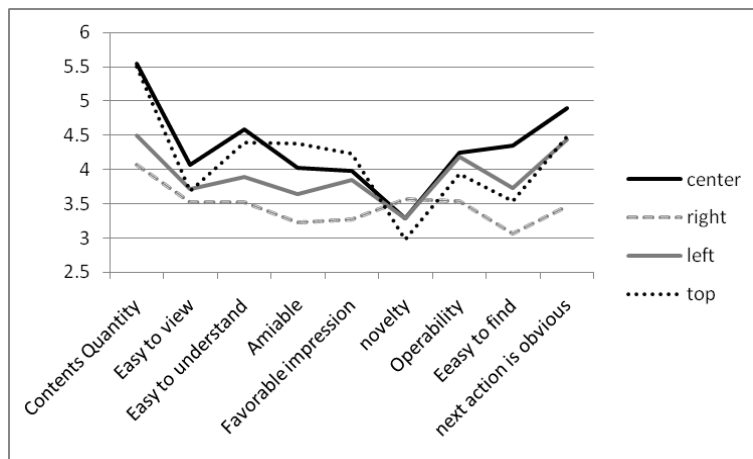


Figure 7: Experiment 2, site C(left), user average

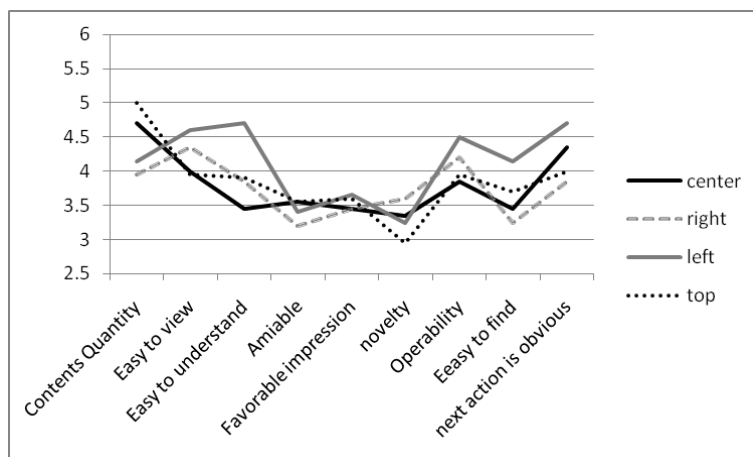


Figure 8: Experiment 2, site D(top), user average

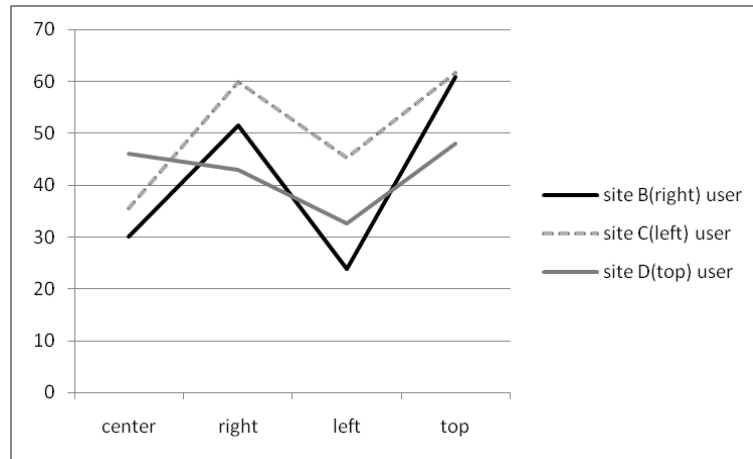


Figure 9: Experiment 2, site D(top), user average

4. DISCUSSION

First, let us discuss the results from Experiment 1. Observing the results of Experiment 1 for each user, it is evident that the users like familiar layouts. This may be because the users unconsciously evaluate websites relative to familiar sites. Therefore, this result indicates that the users think layouts familiar to them are easier to navigate.

Next, let us discuss the results from Experiment 2. The following can be said, when observing the results from Experiment 2 for each user.

- Site B (Right axis navigation) Users feel that left axis navigation is the easiest to use, and the top navigation is the most difficult to use.
- Site C (Left axis navigation) Users feel that center navigation is the easiest to use, while they like the top navigation. In contrast, they feel that right axis navigation is difficult to use.
- Site D (Top navigation) Users feel that the left axis navigation is rather easier to use compared to other layouts.

As can be seen, the results vary depending on the users. This indicates that the evaluation of websites does not depend on the tasks, but rather, the layouts of the websites largely affect the user evaluations.

This result states that the users regard handling different layouts highly, as opposed to familiar layouts.

Next, we look at the correlation with the information searching time. There were no correlations between the users' familiarity of the layouts and the information search time. In other words, a familiar layout did not necessarily shorten the amount of time it took the users to seek out the desired information.

From Experiments 1 and 2, it is evident that visual impressions held by the users differ totally from the impression held by the users after actually navigating through the websites.

5. SUMMARY

This paper was based on a hypothesis that the root cause of information seeking lies in the differences between the layouts deemed easy to navigate by users, and the layouts deemed easy to navigate after the users actually surf through the websites. After the experiment, it became clear that there is a gap between the visual impressions held by the users and the operation impression. This indicates that even when the users think they are choosing layouts that they prefer, they are unconsciously seeking a different layout. Hence, it is important to tend to the users' unconscious demands in designing websites in the future.

6. FUTURE TASKS

This experiment was conducted only on simple layouts. However, the websites of today are becoming increasingly more complex. Therefore, the future researches need to consider those more complex layouts.

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