

Usability Problems In Creating Websites And Web-Based Applications

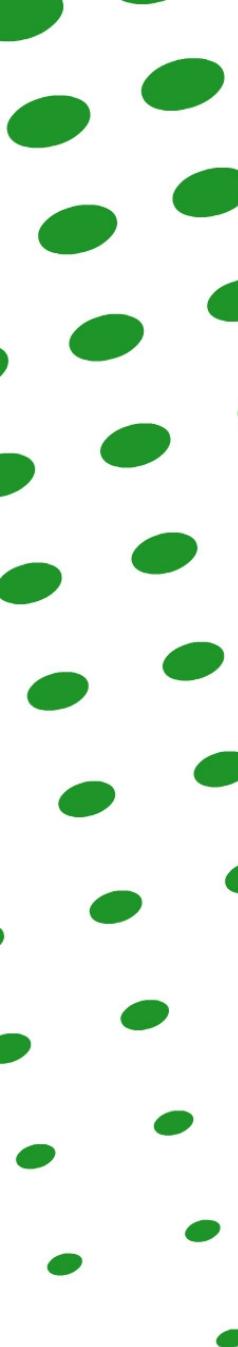


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General

The purpose of this white paper is to provide information for key issues related to usability in websites and web-based applications.

Usability refers to the relation between tools and their users. For a tool to be efficient, it must allow the users to accomplish their tasks, in the best and easier way possible. This principle applies to computers, websites and all other software.

Usability depends on certain elements, like how well the functionality fits user's needs, the well the flow through the application fits user's needs and how well the response of the application fits user's expectations.

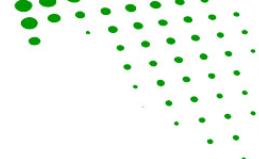
Usability is the quality of a system that makes it easy to learn, to use, to remember, error tolerant and pleasant from a subjective point of view.

Concerning site or web-based applications, the main idea is that, no matter how the administrator wants to use it, there is only one way of creating it and that by is placing the user in the center.

Users should be considered throughout the website creation process. Testing and fixing the errors after having built and launched the website is an inefficient promotion method. Generally, it does not bring good results either. The best way of checking the product is by using a "pervasive usability" model into the production and design process.

The benefits of implementing a usability strategy into the project are:

- Increased end-user satisfaction;
- Increased end-user productivity, success and completed tasks;
- Reduced long-term development costs;
- Reduced training and support costs.



User Interface Design

Usually, the adepts of experimentation cannot analyze web-design from an objective side. A website can be extremely explicite for its creator, but if the design is too abstract (and here we strictly refer to it as being too hard to understand or too complicated), it may cast away users. How many times did you stop to load a page just because it demanded specific plug-ins or you simply were bored after a few minutes of waiting?

Back then when users were more or less connected to learning an application because of high prices and impossibility of choosing, they were forced to get used to a poor designed interfaces. But now, as far as the internet is concerned, users have a lot of options and their votes can cost a lot.

While a nice or impressive design is important for a variety of reasons (including brand identity, attracting people or establishing a level of credibility), for the site to achieve its goal, designs choices have to weighed against meeting users' needs.

The Software Usability Research Laboratory (SURL) has analyzed the elements concerning the problem of users' interface.

During the different studies made by the professors, the principles of site-construction process have been analyzed. And also the first step for design and the relation with the implication of the organizational content.

What SURL focuses on is the use of cognitive predictions of user performance in the process of building complexe interfaces.

The menu's design was also an investigation area - especially for the cascaded menu and the indexed menu. Professors Bernard and Hamblin discovered that information is found quicker if indexed menus are used. In addition, they found out from this study that users prefer this type of menu and not the cascaded one.



Website Design

Web Objects

An essential ingredient when building web content is knowing the typical users' mental model or the characteristic web objects location "schema". Studies made by SURL analyzed the normal web-objects localization schema that each user subconsciously creates, using a normal site. For this, they have examined novice and experienced users. The results showed that the expectations regarding the web objects' locations have been formed by the previous experiences of the users.

In general, participants from all geographical regions that the study covered expected these things:

- *Home* links to be located on the top left side of the page;
- Ads to be located on the top left side of the page;
- Internal links to be located on the left side of the page;
- The *Shopping Cart* link to be located on the top right side of the page;
- The *Help* link to be located on the right top side of the page.

These studies have been remade in 2005. We present here the results:

- *Home* links. The data collected in 2005 reveals the fact that participants still expect the same thinks as they did in 2001.
- Internal links. The new study finds a similar expectation among participants. However, it shows that users have the tendency to choose even the upper side of the page for these links. Their location seems to have been affected by the increased use of DHTML/JavaScript menus.
- The most known technology todays is favorable to multi-level surfing. It is displayed across the top the web page (breadcrumbs).
- The internal search engine. The new study showed that the participants had expected it to be on the top right corner of the page. The users seem to be more and more conscient by the existence of the internal search engines.
- Advertising. Concerning online advertising, the users' preferences seem to have remained the same, as they still consider the top part of websites as being "the ad zone".

The results showed that the users have an immediate tendency of developing and internalizing web-objects. This underlines the need to locate them in the expected location, in order to match the schema.



Advertising

Only a few years ago, most common way of online advertising was through the use of banners. Now systems like AdWords or AdSense gain more and more website space.

Banners

In the studies made by SURL, the accent is placed on the simple analysis of the number of advertising elements that users remember after having visited a site.

The use of animations seem to not have grew online ads' visibility. The results have shown that the participants remembered and recognized the ad information more frequently in the case of pop-ups or floating ads than in the case of other online type of ads. How Bayles observed (2002), animations did not significantly influence these results. Also, the type of ad did not influence the process of recalling the location of the ad.

The advertising companies are now testing banners' effectiveness by calculating "the click-through ratio". This ratio is derived by dividing the number of times an ad is clicked at the total number of times the ad appears. Jacob Nielsen claims that this rate is usually 1%, which suggests that 99% of Internet users are not interested in accessing a certain ad.

Simply comparing the click-through ratio cannot lead us to a conclusion regarding the recognition and recalling the advertised product. For instance, Ipsos-ASI (1999) found that online ads help improving a product's visibility in an equal percent as the television ads. More specifically, 40% compared to 41% for a 30 seconds-long television ad.

Moreover, Benway (1998) demonstrated that users tend to ignore colored and extremely obvious banners rather than the simpler ones. The participants in his study were asked to find a certain information on a website. The information was not found as long as it was included in an obvious banner. Benway called this phenomenon "banner blindness". Also, the study revealed that top side located banners (far from other links) are more likely to be ignored than the ones from the lower side, there where the principal site's links are.

In 1998 Benway stated that animation does not affect user recognition of the products When looking at an "ad" or "non-ad" banner.

In addition, about half of the participants in this study stated that they had noticed at least an advertisement banner on the viewed sites - and most of them also remembered the name of the promoted product. These results show the fact that users remembered that banners existed, although their subject had nothing to do with the information they were searching for on the site or the task that they had to accomplish.

No matter the study or the situation, we have to consider certain elements for the final results, like the familiarity of the advertised products and the graphical design of the banners.



AdWords and AdSense are online advertising systems offered by Google.com.

A. AdSense was defined as a "pay per click" system and it is part of the web solutions list offered by Google.com. Websites administrators can enter the program and so have access at different ad types administrated by Google (for example: text, images and video).

Using the search technology, Google succeeds in serving ads based on each site's content and also, based of users' geographic position. Adsense became a very used method of placing online ads, because they are less intrusive and, usually, the content of the ad is more relevant to the website itself.

Another program that works together with AdSense is **AdSense for Search**. This allows site owners to place Google search boxes on their own pages. When a user searches the web using the Google searching box, Google shares any ad revenue it makes from those searches with the site owner. However, only if the ads on the page are clicked, the publisher is paid.

How does AdSense work

Each time a user visits a page with an AdSense tag, a piece of JavaScript writes and iframe whose URL includes the URL of the page too. Google's servers use a cache of the page for the URL or the keywords in the URL itself to determine a set of high-value keywords. If keywords have been cached already, ads are served for those keywords based on the AdWords bidding system.

B. AdWords is a searching and marketing product that uses short text advertisements on Google and Google's partner network. This is a pay-per-click type of advertising. The users must state for what key-words the ads are going to be published and the price they are willing to pay for a click to make the system work.

When a user looks in the Google search engine, ads for relevant words are shown as "sponsored links". The ordering of the paid listings depends on other advertisers' bids and the historical click-through ratio of all ads shown for a given search. The auction mechanism that determines the order of the ads has been called a "generalized second price" auction.

All AdWords ads are eligible to be shown on www.google.com. Advertisers also have the option of enabling their ads to show on Google's partner networks. The "search network" includes AOL search, Ask.com, and Netscape. Like www.google.com, these search engines show AdWords ads in response to user searches.

AdWords ads also appear on sites that are not search engines. Google automatically determines the subject of the pages and displays ads for the subject the advertiser has specified an interest in. Ads are shown in boxes that look like banners, with the designation "Ads by Google". These content network sites are those that use AdSense.



Esthetics

Color and Balance

To create esthetic pleasing websites, graphic designers usually guide after the classic principles of design. Generally, design plays a major part in creating a first good impression. When a website is harmoniously made, it catches the user, attracts him and creating an inner sense of order, a balanced visual experience. When it is not harmonious, the website becomes boring or chaotic (Lauer & Pentak, 2002). According to Lindgaard (1999), color is a powerful predictor in the overall appeal of a website.

Balance plays an important role too in creating the final image of a website. When they are balanced, the users can feel a psychological sense of balance (Lauer & Pentak, 2002).

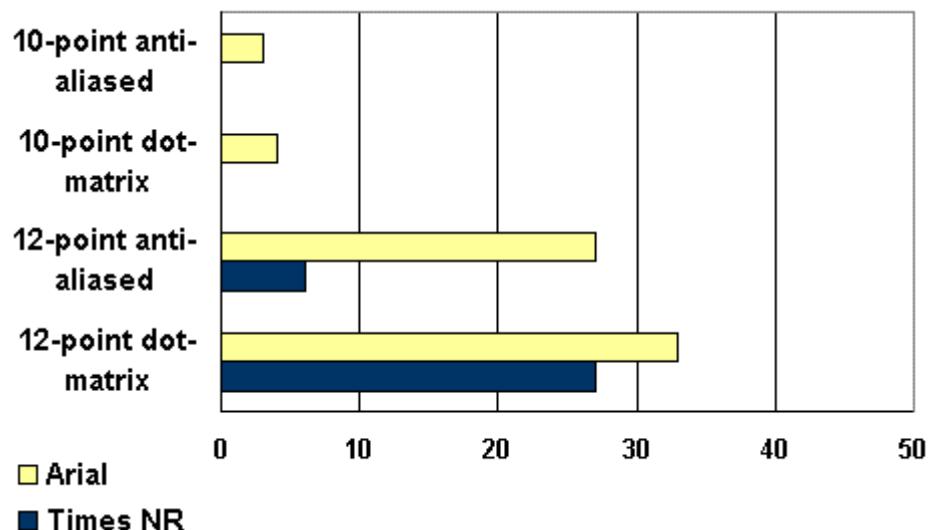
Also, white spaces help reading the texts easier and create an airy, user-friendly overall look.

Font Types and Sizes

By far the two most common types of fonts are the serif font Times New Roman and the sans serif Arial. The question is: which is more legible and at what size? Older studies showed that serif fonts are easier to read on paper than sans serif fonts. The reason seems to be that serif type ones let distinguish each letter (Albers, 1963). However, this benefit can be eliminated on computer screens because of their particularities (like poor resolution).

Regarding Arial and Times fonts, the studies made by SURL show that they can be read easier than Courier, Schoolbook or Georgia. Fonts at the 12-point size can be read easier than those at 10-point size. In general, the fonts perceived as most legible were Arial, Courier and Georgia.

Regarding fonts attractiveness, Georgia and Times serif are considered the most attractive, but were actually, less preferred by the participants at the study.





Easy and quick to read, Verdana was the most preferred font.

Surl compared several online fonts in an attempt to find which is best and why. Although there were no major differences between fonts' legibility, a significant difference was noticed for the reading time. Conclusion: the font types perceived as being most legible are Courier, Verdana, Georgia and Times.

The length a line text should have is not a fixed one. The fact that long lines demand larger ocular movements from the eye must be considered. Also, a text formed by shorter lines demands a bigger number of scrolling operations and that diminishes online reading efficiency.

Navigation

Software Usability Research Laboratory conducted several studies concerning surfing on the internet. These include the use of sitemaps, alternative menus, content presentation methods, breadcrumbs and the waiting time.

Sitemaps

A few years ago they made a study regarding the first 500 companies' websites (Fortune 500), to see what was, at that time, the trend in web design. Recently, they have updated the rapport, thus giving a more detailed analysis concerning sitemaps and all known aspects associated with sitemaps. They have also checked if sitemaps use is justified or not

Preliminary results form SURL professors show the fact that sitemaps can be useful, reducing the feeling of being lost or disorientated within a site. This element can help users conceptualize the framework of a website and enable them to become more efficient in finding information. For this reason, sitemaps are more and more common on websites.

Paging vs. Scrolling

In order to determine the best way to display large amount of information on the internet, several studies were conducted to compare paging and scrolling. As for the results, a study showed that participants prefer layout that included both reduced paging and scrolling, but the moment they had to choose between them, paging was preferred.

The study revealed that users prefer a moderated number of links per site (around 50).

For text passages, paging was found to be slower as use, but it did not show comprehension differences of preferences compared to scrolling conditions.

In an article on the same problem, SURL examined the most efficient way of presenting news online. The study sustains that providing a small amount of information is superior to having long, scrolling pages filled with articles.



Page Delay

Pages with longer delays have been rated as less interesting and harder to find. But a fair webpage evaluation can be affected by the delay and the long loading of the page.

This study measured the degree of lost feeling, the success of accomplishing tasks, the frustrations and the difficulty of a task, all as consequences of page delay.

The effects of page delay were also studied on older people and the results showed that they are more likely to wait for the downloads and the chances to leave the site are smaller.

Searching Tasks and Hypertext Shape

Nowadays there are thousands of search engines available on the internet. Sites like AltaVista or HotBot help users explore World Wide Web (WWW) and find specific informations. And although there are a lot of search engines, the studies regarding them are not that many.

Some searching engines are very simple, using only a word per search, while others are much more complexe, offering advanced search options. These offer the possibility of selecting exactly the elements for the search.

Studies examined the effects of hypertext shape on users' performance. Usually, when people evaluate the accessibility of some informations on a website, it also involves the analysis of the site's physical interface.

Assesing only a site's depth may not provide a clear prediction regarding its accessibility. So, an inefficient shape with a relatively shallow depth might be less informational accessible than one with a greater depth. From these results it is further suggested that websites that have several or more levels of depth attempt to offer the users a bigger number of alternatives, both top and terminal levels of the site.



Conclusion

The discussion as to what constitutes a usable web interface is outgoing. To a certain degree, usability depends upon the purpose and target audience of a particular site.

There is a general agreement as to what web usability is. It means accessible, appealing, consistent, clear, simple, navigable and error tolerant products.

Internet users are impatient and capricious - if they are frustrated by a site they will quit and search the information elsewhere. For commercial sites this is a critical problem. A confusing or difficult to use site may result in the loss of clients or reduced revenues due to unsuccessful transactions.

For informational sites, lack of attention to usability principles may result in users being unable to find the information they need.

Given the fast continuous growth of the Web, it is clear that usability is more and more important issue for site managers and web-designers.

To a certain extent, users are waiting for an instant gratification. Successful websites, commercial or informational, will be those that meet the usability criteria.

To meet these objectives, there are many usability methodologies developed lately. They can be used quickly, cheaply and easily in order to bring useful information to improve website's usability. For best results it is recommended that a variety of these methodologies be used, so that website development and design be treated as an active ongoing process.



Resources

1. **Perception of Fonts: Perceived Personality Traits and Uses** - by A.D. Shaikh, B.S. Chaparro, & D. Fox
2. **Where's the Search? Re-examining User Expectations of Web Objects** - by A.D. Shaikh & K. Lenz
3. **Does the Intrusiveness of an Online Advertisement Influence User Recall and Recognition?** by S. Shrestha
4. **Preliminary Examination of Global Expectations of Users' Mental Models for E-Commerce Web Layouts** -by Michael Bernard & Ashwin Sheshadri
5. **Paper or Pixels: What are People Reading Online?** - by A. Dawn Shaikh
6. **Just How 'Blind' Are We to Advertising Banners on the Web?** - By Michelle Bayles
7. **Aesthetics and Usability: A Look at Color and Balance** - By Laurie Brady and Christine Phillips
8. www.usabilityfirst.com

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