

Determinants of Successful Website Design: Relative Importance and Recommendations for Effectiveness

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Abstract

The success of e-commerce for any company, especially if it is not a well-known name, is greatly dependent on the appropriate design of its Website. This study investigates the determinants of an effective Website. A literature survey indicated that the major categories of determinants are: page loading speed, business content, navigation efficiency, security, and marketing/customer focus. The relative importance of each category was determined by counting the number of citations in the literature, and by soliciting the opinions of end users. The paper concentrates on experts' recommendations of how to create an effective Website from an e-commerce point of view.

Key words: Website design, page-loading speed, Internet navigation, business-content, security, electronic commerce

Introduction

Customers interface with sellers in cyberspace through the sellers' Websites or through malls' or marts' Websites. Like user interfaces in ordinary computing, this interface could be a major success factor, and in many cases it is the major factor that determines buyers' willingness to buy on the Net. Therefore, it is not surprising that during the last year one gets inundated with an avalanche of tips, tricks, do's and don'ts, "sins," and advice on how to build an effective e-commerce Website. These recommendations come from many experts and sometimes contradict each other. The Website designer cannot find all the recommendations and even if he or she finds them, it is difficult to determine which are the most important ones.

The purpose of this study is to investigate this important issue from two different aspects. First, the

opinions of experts are aggregated and analyzed in an attempt to identify those factors where most consensus exists. Second, the opinions of both e-commerce users and potential users are analyzed in order to find their perceived priorities of the factors identified by the experts. Such an analysis can be extremely useful for e-commerce Website design. The paper also provides practical recommendations of some specific improvement actions with their relative perceived importance.

Methodology

In order to identify the major determinants of commercial Website design, we conducted an extensive literature review. Due to the fact that the e-commerce is only in its initiation we were unable to find much academic research. Instead, we found many publications in trade journals written by experts. We also found few practitioners' surveys. Our review of 47 papers from mid-1997 to April 1998, and over 40 Websites yielded over 100 issues relating to Website design. These were classified into five major categories: page loading speed, business content, navigation efficiency, security, and marketing/customer focus. We also collected from the 47 publications, recommendations of how to properly design a commercial Website so it will best work in electronic commerce.

In order to assess the relative importance of the categories, we counted the number of citations in the publications relating to each category. We also conducted a survey among 130 e-commerce customers and potential customers to find their collective prioritization of the importance of the above categories.

Results

Phase I – Literature Review

The literature review identified five major categories. Table 1 lists the categories with their frequency of citation.

Table 1. Major categories

| Category | No. of Citations | % |
|--------------------------|------------------|------|
| Page loading | 33 | 19.3 |
| Business content | 53 | 31.0 |
| Navigation efficiency | 29 | 17.0 |
| Security | 11 | 6.4 |
| Marketing/consumer focus | 45 | 26.3 |

In each of the categories we identified specific recommendations relating to the frequency of citation from the literature sources. These recommendations are discussed in detail later in the paper.

Phase II – Consumers’ Survey

A sample of 130 e-commerce consumers and potential consumers was investigated in Long Beach, California, during summer 1998. A questionnaire was distributed to users that approximate the population distribution of Internet users. The consumers were asked to identify the relative importance (in their opinions) of each of the categories. They rated each of the items within the categories from 1 (very important) to 5 (very unimportant). The results are shown in Table 2.

Table 2. Consumer survey results

| Category | Average for Groups | % |
|--------------------------|--------------------|------|
| Page loading | 2.37 | 21.9 |
| Business content | 2.16 | 20.0 |
| Navigation efficiency | 2.18 | 20.1 |
| Security | 1.96 | 18.1 |
| Marketing/consumer focus | 2.15 | 19.9 |

While the percentages are very close, page-loading speed was rated as the most important category by the users vs. third by the experts’ citation frequency. Security was listed as the least important category in both studies.

Recommendations and Discussion

Each of the major categories listed in Table 1 is described in the remaining part of this paper together with a list of recommendations.

1. Page-Loading Speed

According to a survey conducted by Hamilton (1997) speed (i.e., slow speed) was the number one complaint of Web users (77%). Most potential e-commerce customers do not want to wait for a seemingly endless page to load. Instead, they hit the browser ‘stop’ button and go elsewhere. Therefore, large, pretty graphic files and “cool” animation may come at a price to the Web business owner in terms of lost business (Busch [June 1997, pp. 98-99]).

In some cases page-loading speed is out of the control of the Website builder. Such factors as server speed, customers’ computer power and modem speed, quality of telephone lines, and other factors are to be blamed. Recommended remedies are as follows:

a. Keep graphics simple and meaningful. Wilson (1998) refers to excessive graphics as “Image Inflammation.” He recommends limiting the total graphics and text for a single Web page to 60KB (HTML page text, background image, logo, navigation bar, navigation buttons, and award logos). A rule of thumb is to allocate about 5KB, 5KB, 16KB, 8KB, 16KB, and 10KB, respectively, to each of these elements).

Some graphics are meaningful and necessary where it is imperative to display the product. For example, a flower sales site such as www.flowersworldwide.com would wilt if numerous photographs of the product were not used (See Haine 1998).

b. Limit the use of animation and/or multimedia plug-in requirements. Animation is a contributor to slow page loading. Haine (1998) recommends that if a designer thinks it is necessary to have animation, it should be made to stop cycling after ten seconds to allow the user to scroll it off the screen (See www.hotmail.com).

Nunley (1998) suggests that information content should account for 80% of the site (See www.nolo.com).

Audio clips and other multimedia gizmos that require users to download plug-in programs, install them, reboot and return to the Website drive away users. Blower (1998) advises against using proprietary tags and graphics requiring a banner stating, “Best Viewed with Brand X Browser.” An anonymous author in the March 1998 Economist recommends that designers should not require viewers to download software to view a Website’s contents (e.g., www.pepsiworld.com or www.electronicmarket.com).

c. Use thumbnails. Thumbnail graphics, which typically contain only about 10 KB, are an effective way to utilize graphics without significantly increasing the page-loading time. Thumbnails give the user a choice of whether or not to wait for the loading of a larger picture without forcing it as a default (See www.nytimes.com).

d. Provide 'text-only' choice. Providing an option to load text only increases speed and allows the use of a greater variation of browsers (See Heath [1998]).

e. Check and monitor your server and Internet route. Sometimes a slow Website is not the fault of the designer (See Smith [1997]).

f. Use progressive rendering. Sklaire (in Janal, 1997, p. 352) describes this term as allowing text to load first, followed by graphics. This allows the user to read the content while the graphics are loading.

2. Business Content

Business content is a major Website issue because the quality of presentation and usefulness of the content determine whether a potential customer will be attracted to, or driven away, from the site. Recommended remedies are as follows:

a. Use clear and concise text with proper spelling and grammar to describe the business. This is by far the most commonly prescribed recommendation in the literature. Too often business Websites are ambiguous – one has no clue as to what the business is really about, what the company sells, or what its services are. An example is www.carleson.com, which presents too many companies, including major travel services, but you cannot even make a reservation.

If icons are used, iconize only the most important subjects first. Headings, subheadings, and text should contain only about one-half the words one would normally use in a paper document. “It seems the majority of users – some 79 percent – merely scan pages without taking the time to read what they find ...” (Guglielmo, January 1998, p. 1). Web users scan for two main reasons: 1) Reading from computer screens is tiring, and 2) Web users are too busy and have too much to read – they do not have time to read long-winded pages. A study by Morkes (January 1998) proved that long-winded sites that were rewritten in concise language scored 159% higher in usability, which was measured in terms of task time, task errors, and memory (See www.useit.com/papers/webwriting).

Gardyne (1998) provides nine recommendations: brief sentences; bulleted lists; short pages; highlighted

keywords; colorful, descriptive paragraph headings; one idea per paragraph; most important point first in each paragraph; and half the word count (or less) of conventional writing. Also important to add to this list are proper spelling and grammar (See Blower [1998]). Finally, let us not forget font size/style/color (See www.lenoxhotel.com).

b. Provide contact information on each page. A site with no information on whom to contact may drive business away. Smith (1997) recommends installing ‘mail-to’ links on every page. Maloff (1997, p. 70) suggests a more elaborate method, which is posting threaded on-line discussions, message boards, or even interactions via real-time, on-line chat.

c. Use simple background colors and textures. Heath (1998) prefers green on black, and Wilson (1998) provides a “how to” dealing with colors and textures. Compare www.flowersworldwide.com/plants/tf67-3.html with www.98perfume.com/98perfume/html/gravity.htm.

d. Provide free services or useful information. Free content is a valuable feature (See Bancroft [1997]). But free content is likely to decrease as the Web becomes more mature and commercial. The Wall Street Journal, Business Week, and others provided free information for months and then started to charge for it. Wilson (1997) believes that prospective customers are more likely to purchase when site owners make sure that the free service is closely related to what is being sold.

An interesting example is the services provided to Internet communities. An example is N2K that developed Web pages for specific communities (e.g., classical music lovers).

Gardyne (1998) recommends that Websites should include useful resources and tools. Some examples are listed below:

- Provide a currency converter such as that at www.xe.net/currency.
- Provide an HTML checker - see www2.imagiware.com/Rxhtml.
- Provide a banner generator - see www.coder.com/creations/banner.

e. Make regular changes to the site. This is wise for two reasons: 1) Visitors want to see fresh material, and 2) Updating the site often will ensure that the information is current.

f. Limit registration forms and the amount of requested information on them. Another way to drive away customers is to blitz them with intimidating

registration forms, and especially those that request a burdensome amount of unnecessary information.

g. Jokes on the site—avoid or not. There are differing opinions regarding this recommendation (See Heath [1998] and Guglielmo [1998]).

Contrary to this opinion, Janal (1997, p. 311) states that telling jokes (and adding a new one each day) on the Website is a good business strategy and results in repeat visits (See www.etla.fi.pkm/joke.html).

h. Create a Frequently Asked Questions (FAQ) section. It enhances users' understanding of what is offered at a site. It also helps the site owner by reducing the amount of correspondence necessary to answer repeatedly the same questions.

i. Avoid 'Under Construction' signs. Berst (1998) listed this as one of his "Seven Deadly Website Sins." If you must use such a sign, provide an approximate date of opening.

Tadger (1998) recommends to "design for flexibility." This means that urgent changes can be made without having to take the site off line.

3. Navigation Efficiency

Without efficient and user-friendly navigation, the user is likely to get confused, lost, or frustrated and leave the site for good. A good source for understanding the 'usability of a site' based on scientific studies is found at <http://world.std.com/~uieweb>. Listed below are several recommendations.

a. Use well labeled, accurate (no broken) links. An ambiguously labeled link or a link that hits a dead end is one of the most annoying design faults in a Website. Haine (1998) recommends to word each link carefully so that it answers two questions: 1) "What will I get if I click here?" and 2) "Why would I want to get that?" Compare www.fool.com:80 with www.carpoint.msn.com.

b. Avoid the use of frames. One of the reasons for using frames is when a company wants to make its logo visible from all underlying pages. But frames have been overused in many Websites. Tadger (1998) brought out these points:

- Frames make bookmarking difficult.
- Some browsers do not support frames.

Wilson (February 1998) adds: frames cut up the screen into windows that require excessive vertical and/or horizontal scrolling, they look ugly, they do not always print out correctly on some browsers, they are resented when site owners use them to link to from external sites,

and their content is often skipped when search engine "spiders" come to call.

Berst (1998) adds: some frames do not scroll when they should while others do scroll when they should not and some frames produce a miserable patchwork effect.

Bremser (1997) supports the use of frames but only if the frame layout is made simple. For instance, California State University, Long Beach at www.csulb.edu/index.html allows the user to toggle the frames on or off.

c. Keep navigation consistent. There is some disagreement in the literature on this issue. Wilson (February 1998, p. 5) states, "Provide as many alternate ways to navigate your site as necessary. Buttons, image maps, hyperlinks, search engines, and drop-down menu systems all contribute to overall user friendliness when used appropriately." Berst (1998, p. 1) disagrees by stating, "Sometimes you click on a left sidebar. Sometimes you get a drop-down box. Okay, I know we're all still inventing this as we go along. But if your core navigation metaphor changes mid-stream, you have committed a sin. Even if you haven't created perfect navigation, at least be consistent. Please."

Tadger (1998) supports a navigation bar on each page. Also, buttons on any navigation bar should be those that let customers make purchases (i.e., take the customer straight to the cash register).

d. Provide an effective search engine in the site. This applies mainly to large sites or for sites with a lot of randomly accessed content (See www.wal-mart.com). Haine (1998, p. 4) puts it very succinctly: "...in e-commerce, each failed product search is equivalent to a clerk saying 'Sorry, I don't think we carry that item.'"

Search engines should be prominent and easy to use. Metacrawler at www.metacrawler.com, for example, gives the user radio button choices to search a text string by 'any,' 'all,' or 'phrase.' Sophisticated sites, such as www.compare.com, allow both search and price comparisons.

e. Use distinctive hot buttons. Hot buttons provide easy navigation and a personalized effect to the Web page. Busch (1997) recommends using unusual shapes and colors (e.g., paint blobs, 3-D effects, burlap, or sandstone textures, etc.) in addition to the traditional rectangular or circular shapes. Kramer (December 1997) introduces the Flash 2 software that creates rollover effects for buttons. Moving the cursor over the button will pop open a text box describing in more detail where the button works. Also, by providing a statement, "Click here," the user knows immediately where to click without the need to move the mouse in searching for a place.

f. Use long pages with links rather than subsequent pages. There is a some disagreement on this issue. Heath (1998) suggests that long pages with links within the page are confusing because users scroll down to read a paragraph, then return to the top of the page only to select the same paragraph again from the index.

Janal (1997) disagrees by stating that using long pages with links should be encouraged. Linking within one long page is also faster than reloading subsequent pages.

g. Use site maps/guides if the site has many underlying pages. A large site with several underlying pages should have a map or guide that allows the user to jump to any page from any page.

h. Avoid links that open up new browsers or pop-up ads. These links may be both invasive and offensive. It wastes the users' time and energy because new pages and/or browsers popped opened force them to wait, and "point and click" to close.

4. Security

Security has become a very important issue with the development of the Internet Websites. The major recommendations are listed below:

a. Stress the use of security. To enable secure transactions it is necessary to implement SSL or SET technology. VeriSign, for example, at www.verisign.com provides a digital ID for a one-time fee of about \$350 and an annual fee of about \$250. As Tadjer (1998) states, "the words 'secure server' help to make the consumer feel safe. Also, an optional link to a security practices page and/or legal notices for visitors to read also add an additional calming effect."

Sweet (1998, p. 60) listed eight credit card transaction processors that make electronic storefronts pay off and reduce fraud. These are CyberCash, CyberSource, IC Verify, Open Market, Verifone, VeriSign, IBM Internet Division, and ClearCommerce.

b. Protect your copyrights. Anytime a Website owner writes, paints, or composes something new, it is advisable to copyright it. One method to do this is to get the 'MD5 hash code' for the file, then publish the hash code in any newspaper. A copy of the 38KB MD5 zip file (md5sum.zip) can be downloaded to encrypt electronic copy. It is also important to place a statement in the Web page indicating that the material is copyrighted. More information on copyright law can be found at www.fairuse.stanford.edu.

c. Generate a confirmation page after a consumer makes a purchase. A confirmation notice (and number) of a purchase is very useful. Further, e-mail confirmations that the order was shipped is also a good idea.

5. Marketing/Customer Focus

A Website should be evaluated as to how well it markets its products and services, and also as to how well it keeps the customer in focus. Basically, three objectives are pursued: 1) create awareness, 2) generate traffic, and 3) drive sales. Several questions should be answered: How well does it target its audience? How well understood is the customer? Does the site owner know what the customer wants? Does the owner have the customer in focus? Is the site customer-friendly? Is the site designed to generate revenue? Listed below are some recommendations regarding this topic:

a. Promote your site.

- List keywords and then submit the page to important search engines like Yahoo and HotBot (Wilson, 1997).
- Create a page for each product and register each page with a search engine.
- Arrange reciprocal links with other business Websites.
- Include URL on stationery, business cards, brochures, and any company literature sent out to customers.
- Include URL on display advertising like classified ads, newspapers, and trade journals.
- Create a press releases section. Issue news releases using a news release service such as www.urlwire.com.
- Publish an e-mail newsletter.
- Send out an e-mail notice when something new is added to the site.
- Install a signature in your e-mail program to list phone number, URL, etc.
- Use mailing lists and news groups such as www.dejanews.com.
- Join a mall and/or on-line community. (See Fowler [1997]).
- Join a banner exchange program or purchase banners on other sites.
- Encourage visitors to bookmark your page.
- Create a catalog of products and/or services.
- Conduct contests.
- Collect visitor e-mail addresses; rent targeted e-mail lists, but do not send unsolicited e-mail (spam).
- Advertise your site on TV, radio, etc.

b. Find out what the customer wants. One way to collect customers' wishes is to track their interests. Once you know what your customers want, you can serve them better. For example, Wilson (December 15, 1997, p. 4) indicates three ways to track shoppers that use carts:

- Cookie – small computer file containing cart number is transmitted to user's Web browser and remains on user's hard drive (not recommended due to widespread negative publicity).
- Temporary IP number – automatically assigned to user's ISP when logged on. Icentral's ShopSite Manager store software (www.icentral.com) uses this method when user's browser is set to not accept cookies.
- Randomly generated cart number – appended to user's URL to follow user to other sites. Mercantec SoftCart StateTrack storefront software located at www.mercantec.com uses this method.

Another way to find out what the customer wants is to conduct surveys using online questionnaires. Several intelligent agents, like www.firefly.net predict what the customer's interests are based on a series of questions that create a customer's profile. Amazon, for example, lets customers know (by e-mail) when their favorite author publishes a new book or when a new book is published on a topic of their interest. Expedia (www.expedia.com) will push travel information to your designated sites.

Conducting off-line market research is another viable alternative, but is more expensive than the methods listed above. Finally, the storefront owner should also have a knowledgeable individual on Web marketing give feedback on the site.

c. Give users something to do. This can be in the form of games, puzzles, and contests. A toy company, www.nevergrowup.com, amuses customers with "Toys, Games, Puzzles, Crafts and other Cool Stuff for the Kid in all of us!" Less Stress Instructional Services at www.lessstress.com/simulator/sim.htm has an "Ambulance Simulator" program.

d. Provide as many payment alternatives as possible. The more payment alternatives a site offers, the more likely a sale will result. If certain customers refuse to accept the fact that an encryption setup like CyberCash is safe, then give them the option to fax or call their credit card number in. Also, if international business is expected, make it easy to accept local currency. Provide current exchange rates.

e. Be up front about business practices. One of the best ways to gain trust is to be honest with the customers about business practices. If cookies are used, the site owner should disclose that information. Also, the business

practices should be displayed openly on the home page to build reassurance.

f. Create a domain name that is easy to remember. A good example is www.hothothot.com that sells hot sauces. Most companies use their trade names.

g. Use an auto responder. The storefront owner should always automate to expedite e-mail replies. A customer who fails to get a timely answer to a question via e-mail is likely to be a lost customer. Most e-mail programs, like Microsoft Exchange, have auto responders built in. By using intelligent agents, it is possible to sort e-mail and send customized replies (e.g., see Maes [1997]).

h. Sell pages of information. The information should also be attractive enough to motivate buyers to download a plug-in like that at www.pay2see.com to view and print the contents.

i. Avoid using visible hit counters. Heath (1998), advises against the use of visible hit counters. If the site has low traffic, one would not want to advertise that. If the traffic is high, according to Heath, it would have the same effect as a company bragging about how many sales calls or brochures it mails out every month.

j. Place internal links before sending users away from site. If outside links are necessary, they should not be placed on the home page. The visitor should first get a taste of what is being offered in underlying pages of the site before being ejected away via external links.

k. Ask for the order and offer discounts, incentives, etc. Simply put, how can the storefront owner expect a sale if he does not ask for the sale? To drive the sale home, it is a good idea to also offer discounts, freebies, coupons, and other incentives.

l. Write the Website in English or give the English choice. English is recognized as the worldwide universal business language. Therefore, writing a Website in English (or at least giving the English choice) seems to be the logical thing to do. Buttons with the language choice provides the user with the convenience to select the preferred language.

Conclusion

The abundant literature on this subject indicates the trend in designing Websites is toward simplicity. "Cool stuff" is on its way out. Revolving windings, flashing banner ads, grotesque background colors and textures, and a meaningless multitude of multimedia effects that

require endless plug-ins will be extinct as electronic commerce continues to advance.

The results of the users' survey also suggest that page-loading speed is the most important category. Users no longer want glitter – they want content and service, and they want it fast. This demand will continue to drive Website design toward speed, navigation efficiency, simplicity, and elegance with an emphasis on customer focus and security.

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