

2000

A Comparison of the Most Important Website Features in Different Domains: An Empirical Study of User Perceptions

Ping Zhang

Syracuse University, pzhang@syr.edu

Gisela von Dran

Syracuse University, gvondran@som.syr.edu

Paul Blake

Syracuse University, pblake@syr.edu

Veerapong Pipithsuksunt

Syracuse University, vpipiths@syr.edu

Follow this and additional works at: <http://aisel.aisnet.org/amcis2000>

Recommended Citation

Zhang, Ping; Dran, Gisela von; Blake, Paul; and Pipithsuksunt, Veerapong, "A Comparison of the Most Important Website Features in Different Domains: An Empirical Study of User Perceptions" (2000). *AMCIS 2000 Proceedings*. 41.
<http://aisel.aisnet.org/amcis2000/41>

This material is brought to you by the Americas Conference on Information Systems (AMCIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in AMCIS 2000 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

A Comparison of the Most Important Website Features in Different Domains: An Empirical Study of User Perceptions

Ping Zhang, School of Information Studies, Syracuse University, pzhang@syr.edu
Gisela von Dran, School of Management, Syracuse University, gvondran@som.syr.edu
Paul Blake, School of Information Studies, Syracuse University, pblake@syr.edu
Veerapong Pipithsuksunt, School of Information Studies, Syracuse University, vpipiths@syr.edu

Abstract

This study uses an inductive thematic analysis approach to examine user perceptions on the importance of website design features in six different website domains: Financial, E-Commerce, Entertainment, Education, Government, and Medical. The five most important features, as well as the five most important families of features, were identified for each of the domains. The results indicate that (1) there are certain features that are equally important among different domains; (2) there are other features that are extremely important for one domain and extremely unimportant for another. The study provides empirical evidence for website designers and evaluators about which features are more important to focus on when dealing with different domains of websites. It adds value to the current literature on consumer behavior in the electronic environment and web usability studies.

Introduction

In the web environment, users are consumers. Understanding consumers' expectations and how they feel about the websites they use has recently become more important. Few current web usability studies are based on either theoretical frameworks or empirical evidence (Conger & Mason 98; Small 98; Spool et al. 99; Wilkinson et al. 97). Most studies provide some guidance for designers largely based on heuristics or rules of thumbs. These studies do not identify website design features that contribute to consumer satisfaction or dissatisfaction, address different quality expectations, nor do they provide any insight into whether some features are perceived more important than others by the users.

Zhang et al. (1999, 2000) provided an emerging theoretical framework to distinguish between the website design features that satisfy users from those features that dissatisfy users. In their study, subjects were asked to classify certain features into satisfiers and dissatisfiers, which showed support for the framework. Von Dran et al. (1999, 2000) approached the issue from a different angle. They applied a marketing model to the web environment by focusing on users' different quality expectations.

Again, the empirical data showed that the model can be used to distinguish the features that meet users' basic, performance, and excitement quality needs.

Both studies imply that the specific web domain or the purpose of a website impacts what users think about the features as satisfiers/dissatisfiers or how they meet different quality needs. On the other hand, the studies did not address user perceptions on whether some features are relatively more important than others.

The objective of this study is to use a bottom up approach to examine user perceptions on the relative importance of features in different domains. The results show that (1) the importance of features or families of features is dependent on the particular domain a user is working with; (2) certain features or families of features are extremely important for one domain and extremely unimportant for others; (3) there are certain features or families of features that are equally important among all domains. The current study provides designers with empirical data of the most important features to focus on when faced with design capacity limitations.

Research Method

Few existing studies provide either theoretical frameworks or heuristics of examining the relative importance among website design features. Thus, there are few existing theories or models that can be used to guide the study. We decided to use an inductive (data driven) thematic analysis approach (Boyatzis, 1998) in this study.

Data Collection

Six domains of websites were chosen for the study. They were:

- Financial Information Websites (such as CNNfn.com, quote.yahoo.com)
- E-Commerce Websites (such as Amazon.com, e-Bay.com)
- Entertainment Websites (such as a cartoon or a game website)

- Educational Websites (such as National Geographic or a university's website)
- Governmental Websites (such as US Department of Labor, and the White House website), and
- Health or Medical Information Websites.

In a survey, subjects were asked to list, in priority order, the five most important website features for each of six different website domains. 67 graduate students at a major northeast university participated in the study. Among the subjects, 32% were male and 68% female. The average age was 33 (with a standard deviation of 8). Subjects were paid \$10 upon their completion of the survey. Three of the subjects did not understand the requirement and provided unusable answers, and these sets of data were dropped during the analysis. Table 1 shows example answers from one subject.

Coding in Thematic Analysis

Thematic analysis (Boyatzis, 1998) was conducted on the subjects' answers to the questions. In this data-driven approach, two independent raters worked directly from the raw answers to extract words and phrases, which were used to generate the codes. This close relation between the codes and the raw answers helped to improve the coding consistency between the raters. The codes are measured by the magnitude of the appearance (that is, frequency). The software used for the coding was ATLAS.ti, version WIN 4.2.

Developing a initial code schema

The unit of the analysis (defined as a quotation in ATLAS.ti) was regarded as the whole answer a subject had for one domain. The unit of coding (a code in ATLAS.ti) was the particular features that subjects listed in their answers. The codes were developed using the original words and phrases in the quotations in one domain, the financial domain. Most responses in the survey are manifest, however, some are latent, which required interpretation by the raters (Boyatzis 98, p16). A consensus meeting with a third rater resolved the disagreements between the two independent raters. This included establishing rules of how to break quotations into meaningful units of coding while keeping the priority ranking provided by the users in the codes. Thus, for s181's answer for the entertainment domain (which is a quotation, see Table 1), five codes were developed with the priority embedded in the codes: (1) multi-media 1, (2) interaction 2, (3) display/images/graphics 3, (4) quick download time 4, and (5) links 5.

In this paper, a super code is defined as a term with distinctive meaning; and a code is a super code with a suffix indicating the priority. For example, "customization" is a super code and may include five codes: customization 1, customization 2, customization 3, customization 4, and customization 5. It is thus possible

that in a particular domain, only one or two codes were used from a super code.

Scaling of the initial code schema

Before the code schema was applied to other domains, the super codes were scaled (Boyatzis 1998, p134) into a more manageable list. This included the consolidation of similar super codes as a new super code with a higher level of abstraction. For example, after the scaling, the codes for s181's quotation for the entertainment domain became (1) multimedia 1, (2) interactivity 2, (3) visual design 3, (4) site responsiveness 4, and (5) links to information 5. The result of the scaling was a new code schema of 118 codes.

Application of the code schema to other domains

When the two raters coded the remaining domains, the original words or phrases from the subjects were either identified as belonging to an existing super code or a new super code. Consensus meetings were conducted for coding results of each of the domains and the inter-rater reliability scores were calculated both before and after the meetings. All inter-rater reliability scores are above 85%.

Clustering similar codes into families

Clustering is defined as "...the organization of multiple themes into groups" (Boyatzis, 1998, p134). The clustering of the super codes revolved around the creation of families and placement of super codes within those families. For example, the family of "Navigation" included codes like "easy to navigate," "navigation aids," and "clear layout of information," to name a few. The clustering was based on the code schema and not on any previous theories, so these families more accurately reflect the respondent's answers.

Overall scaling and clustering

As an iterative process, scaling was conducted again once all domains were coded. This scaling task is coupled with the refinement of families. Several super codes with single responses (one response for the entire super code) were compressed with other super codes. Similarly, family memberships were adjusted in order to eliminate families with only one super code and to reflect stronger semantic coupling among super codes.

Data Analysis and Results

Some subjects mentioned that they did not use or never used websites in certain domains (see s181 in e-commerce domain in Table 1). Thus, they could not and did not provide any opinions on which features were most important. For those participants who provided their perceptions on some or all domains, the analysis was conducted at two levels: the code and the cluster (or family as noted in ATLAS.ti) of codes. Sometimes designers or evaluators of websites need to focus on a

small number of factors that affect user perceptions of websites. Thus, it may be helpful to group features into higher level of abstract units, namely clusters or families of features. These families may provide a better overview of the characteristics of website features. Since subjects were able to give a list of features with priority (order of importance), we used this information in our analysis in the form of weighted frequencies at both the code and family levels.

Weighted Rank of the Most Important Features for Different Domains

For each code in each domain, the weighted score is determined by the frequency of the code in the domain multiplied by the weight for the priority that was assigned by the subjects. That is:

$$\text{Score} = \text{PriorityWeight} * \text{Frequency},$$

while PriorityWeight is defined as: First priority (most important) has a weight of 5, Second (second most important) 4, third 3, fourth 2, and fifth 1.

Table 2 lists the five most important features for each of the six domains based on the weighted frequencies. The following are some observations from the table.

1. The Financial domain has high requirements on the nature of the information, such as *up to date*, *accuracy*, *multiple sources*, and *timeliness*.
2. *Easy to navigate* is also very important as ranked as number 4 for the financial domain. For all other domains, however, *easy to navigate* is highly ranked as either number one or two. Thus, it is a must-have feature for all six domains.
3. *Up-to-date information* is very important for the financial domain, and is true for the government, medical and entertainment domains. The feature, however, is not listed within the five most important features for the education and e-commerce domains.
4. The Entertainment domain has high demand on *visual design*, *multimedia* and *site responsiveness*, which are not in the list of any of the other five domains.
5. *Search tool* is commonly ranked by the following four domains as important: education, government, medical, and e-commerce.
6. The Education and medical domains require *comprehensiveness of information*, which is not ranked within the five-most important list in the other four domains.
7. *Accuracy of information* is most important for the medical domain, somewhat important for the financial, education and government domains, but is not within the five-most for the e-commerce and the entertainment domains.
8. *Security of data* is ranked number one in e-commerce domain but does not appear in any other domains.

Weighted Rank of the Five Most Important Families for Each Domain

There is a total of 15 families/clusters of features as shown in Table 3. One of them is for the responses of "Do not use / never used the domain" and is disregarded from the analysis. The weighted score of a family is calculated by using the weighed scores of the super codes belonging to the family. Table 4 lists the five most important families for each of the six domains. Table 4 shows that:

1. *Navigation* is ranked among the top three most important families in all domains.
2. *Completeness/Comprehensiveness of Information* is among the top two most important families in all but the E-commerce and Entertainment domains.
3. *Site Technical Features* (most responses are from Search Tool feature) is ranked from the 3rd to the 5th family in all but Financial and Entertainment. This implies that users take whatever is available on the first page (immediate access)of these domains. They don't expect to search in these websites.
4. *Currency/Timeliness/Update* is among the top three for the Financial, Medical and Government domains.
5. *Accuracy* is listed as the 4th or 5th family for the Financial, Medical and Government domains.
6. *Readability/Comprehension/Clarity* is ranked as 4th or 5th for the Financial, Education, and E-Commerce domains.

Table 4 also indicates there are three domains that require unique families. For example, the Education domain requires *Information Reliability/Reputation*; E-Commerce demands *Security/Privacy* and *Product and Service Concerns*; while Entertainment requires four unique families: *Visual Design*, *Engaging*, *Information Representation*, and *Site Accessibility/Responsiveness*.

Figure 1 depicts the similarities or differences among the domains in terms of the composition of the most important families. Some domains share the common families. Figure 1 confirms some of the observations from Table 4. Specifically, Figure 1 shows that:

1. The Government, Education and Medical domains have similar "patterns" of the most important families. For example, they all have high F02 and F07 and low F04, F06, F09, F12, and F13. This means that designers can focus on the concerns that these domains have in common.
2. The Financial, E-Commerce and Entertainment do not seem similar to any other domains, or to each other. This implies that these domains should be designed differently from other domains focusing primarily on the particular reason that users come to the sites.

For the E-Commerce domain, users treat products/services as website features. This implies that having impressive or great website features alone is not enough--users need good products and services from the website.

Discussion and Conclusions

The analyses of codes and the families of codes show some interesting facts about users' perceptions on importance of website features and families of features.

1. The importance of features or families of features is dependent on the particular domain a user is working with.
2. Certain features or families of features are extremely important for one domain and extremely unimportant for others. For example, Engaging is the 2nd most important for Entertainment, but almost the least important for the other five domains; Security/Privacy is the most important family for E-Commerce domain but is not listed as important in the rest of the domains.
3. There are certain features or families of features that are equally important among different domains. For example, Navigation is among the top of important families in all the domains.

The findings provide practical suggestions to at least three types of people. For website designers, the study implies that different domains should be designed with different foci of important features. For website owners or corporate strategists of E-C websites, the study indicates that users regard the website design and company products/services as one unit. For independent website evaluators/critics, this study recommends that different domains require different sets of evaluating criteria/tools.

References

Boyatzis, Richard E. (1998). *Transforming Qualitative Information: Thematic Analysis and Code Development*. Thousand Oaks, CA: Sage Publications.

Conger, S.A. and R.O. Mason (1998), *Planning and Designing Effective Web Sites*, Course Technology, Cambridge, MA.

Small, R.V. (1998), *Assessing the Motivational Quality of World Wide Websites*, ERIC Clearinghouse on Information and Technology, Syracuse, NY, (ED 407 930).

Spool, Jared, T. Scanlon, W. Schroeder, C. Snyder, T. DeAngelo (1999), *Web Site Usability - A Designer's Guide*, Morgan Kaufmann Publishers, Inc. San Francisco, California

von Dran, Gisela, Ping Zhang, and Ruth Small (1999), Quality Websites: an Application of the Kano Model to Website Design, *Proceedings of the 5th Americas Conference in Information Systems (AMCIS'99)*, August 13-15.

von Dran, Gisela and Ping Zhang (2000), A Model for Assessing the Quality of Websites, *Proceedings of Annual Conference, American Association for Information Science (ASIS 2000)*, Chicago, November 13-16, 2000

Wilkinson, G. L. , L.T. Bennett, and K.M. Oliver (1997), Evaluation Criteria and Indicators of Quality for Internet Resources, *Educational Technology*, May-June, 52-59.

Zhang, Ping, Gisela von Dran, Ruth Small, Silvia Barcellos (2000), A Two-Factor Theory for Website Design, *Proceedings of the Hawaii International Conference on Systems Science (HICSS 33)*, Hawaii, January.

Zhang, Ping, Gisela von Dran, Ruth Small, Silvia Barcellos (1999), Web Sites that Satisfy Users: A Theoretic Framework for Web User Interface Design and Evaluation, *Proceedings of the International Conference on Systems Science (HICSS 32)*, Hawaii, January 5-8.

Table 1. Example Answers by One Subject

Subj. ID	1. Financial	2. E-Commerce	3. Entertainment	4. Educational	5. Governmental	6. Health or Medical
s181	current information (ie. recent updates), variety of different markets, readily available detailed information, other links, graphs and other supporting historic data	don't really utilize e-commerce websites	multi-media, interaction, displays, sharp images, graphics, quick download time (if applicable), links	navigation to find appropriate material, good searches (advanced features), downloadable publications, so you don't have to view online (pdf files), links, references	organization, table of contents, current information, easy access to current regulations, good searches, downloadable regulations	references to medical associations, current information, searches, different points of interest, accessibility

Table 2. Five Most Important Features

Order	Financial	Score	Educational	Score	Governmental	Score
1	Up-to-date information	92	Easy to navigate	107	Easy to navigate	100
2	Accuracy of information	81	Search tool	85	Clear layout of information.	77
3	Multiple information sources	76	Accuracy of information	72	Up-to-date information	66
4	Easy to navigate	52	Comprehensiveness of information	55	Search tool	64
5	Timely information	32	Clear layout of information	54	Accuracy of information	62

Order	E-Commerce	Score	Health or Medical	Score	Entertainment	Score
1	Security of data	121	Accuracy of information	87	Visual design	172
2	Easy to navigate	97	Easy to navigate	60	Easy to navigate	70
3	Appropriate explanatory text	59	Search tool	53	Site responsiveness	68
4	Search tool	45	Up-to-date information.	53	Multimedia	58
5	Product and service price concerns	44	Comprehensiveness of information	52	Up-to-date information	50

Table 3. A List of Families, Definitions of Each Family, and Frequency Counts across Domains

FID	Family	Definition	FIN	E-C	ENT	EDU	GOV	MED	Totals
F01	Accuracy	No errors, correct, exact, precise, right, true	19	11	2	19	14	21	86
F02	Completeness/Comprehensiveness of Information	Large in scope or content, containing a variety of information or sources	51	13	23	53	42	51	233
F03	Currency/Timeliness/Update	Information is current, up to the moment, real time, timely	46	10	16	18	32	27	149
F04	Engaging	Cognitive advancement, emotional connections, personal expressions	5	3	42	13	2	7	72
F05	Information Reliability/Reputation	Information dependable, the condition of being held in high esteem, being authoritative, high reputation of information source	11	7	5	19	14	17	73
F06	Information Representation	The way information is presented, maybe in different format/media, customized displays	16	11	22	8	1	3	61
F07	Navigation	Features to make navigation possible, site maps	31	65	33	55	53	35	272
F08	Visual Design	Visual Appearance	2	7	46	19	3	3	80
F09	Product and Service Concerns	Features concerned with products/services offered/sold through the website, not about the site itself; price and availability of products/services	8	64	4	5	10	12	103
F10	Readability/Comprehension/Clarity	Ability to comprehend the meaning of written or printed words or symbols, to perceive or receive well	17	19	11	22	20	18	107
F11	Relevant Information	Information that directs to the point, having to do with the matter at hand	19	1	0	12	8	13	53
F12	Security/Privacy	Confidentiality of information, things that give or assure safety and guarantee	7	47	4	1	6	9	74
F13	Site Accessibility/Responsiveness	Being able to access the website; responsiveness of the site to user's request in terms of time.	12	19	21	10	4	8	74
F14	Site Technical Features	Features such as search tools, downloadable (printer friendliness), chat rooms.	6	19	2	30	24	22	103
F15	Do not Use / never used		12	3	10	2	12	8	47
	Total Frequency		262	299	241	286	245	254	1587

Table 4. The Most Important Families

Order	Financial	Score	Educational	Score	Governmental	Score
1	Currency/Timeliness/ Update	173	Navigation	186	Navigation	193
2	Completeness/ Comprehensiveness of Info.	129	Completeness/ Comprehensiveness of Info.	142	Completeness/ Comprehensiveness of Info.	114
3	Navigation	93	Site Technical Features	98	Currency/Timeliness/ Update	96
4	Accuracy	81	Information Reliability/Reputation	79	Site Technical Features	76
5	Readability/Comprehension/ Clarity	54	Readability/Comprehension/ Clarity	78	Accuracy	62

Order	E-Commerce	Score	Health or Medical	Score	Entertainment	Score
1	Security/Privacy	201	Completeness/ Comprehensiveness of Info.	149	Visual Design	172
2	Navigation	196	Navigation	111	Engaging	132
3	Product and Service Concerns	162	Currency/Timeliness/Update	97	Navigation	105
4	Readability/Comprehension/ Clarity	64	Accuracy	87	Information Representation	74
5	Site Technical Features	56	Site Technical Features	64	Site Accessibility/ Responsiveness	68

Figure 1. The Importance of the Families for the Six Domains: Similarity and Differences among Domains

