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Abstract

An important aspect of web site design involves anticipating and understanding consumer reactions to various web site attributes and using this information to make web sites more useful and satisfying for them. Unfortunately, IT professionals may not be well suited for this task. Through their training and employment experiences, IT professionals are likely to adopt perspectives and evaluation standards different from those used by consumers. As a result, they may lose touch with consumer wants and needs concerning web site design and content. This working paper examines differences in these two groups' perceptions of design features, website content, and convenience, and examines how their perceptions affect overall evaluations and satisfaction with web sites.

Introduction

Before they can achieve any other goals, web sites must effectively communicate information to a set of receivers. Communication theory suggests that detailed, specific knowledge of audience characteristics is fundamental in the design of effective communication. Information content, the method of presentation, and ways of interacting with information sources should be tailored to receivers' needs and abilities to process the information (Short, Williams, and Christie, 1976; Sitkin, Sutcliffe, and Barrios-Choplin, 1992). Web sites that users perceive to be more interesting, engaging, easier to use, more useful, or more satisfying are likely to be more effective in achieving the sponsor's goals.

Web site designers' assumptions about who the users will be and how they will react to various features of the web site probably have a strong influence on the design process. Designers need to consider the experience, skills, motivation, and interests of potential web site users. If they fail to do this, they may waste time creating features that are interesting to other designers, but valueless, or perhaps even irritating to users. For example, the use of pop-up windows and animated graphics may appeal to designers or IT professionals who appreciate the programming expertise needed to make them work, whereas non-experts might find them distracting or confusing. On the other hand, novices might respond favorably to sound effects, scrolling banners, mouse-overs, and other features that seem tame to designers and IT professionals who have viewed a great number of web sites with similar features. Our contention is that differences in experience (Carlson and Zmud, 1998) and goals (Buller, 1986) will explain differences in the way IT experts and non-experts perceive web site characteristics and in the way they evaluate web sites effectiveness and other outcomes. Surprisingly few studies have tested differences in IT experts and non-experts perceptions of specific attributes of web sites.

Objectives

This paper has four objectives. First, it examines some differences between IT experts and non-experts that are likely to affect their perceptions and evaluations of web site characteristics. Second, it identifies web site characteristics that are likely to be perceived differently by IT experts and non-experts. Third, it develops propositions concerning these differences. Fourth, it describes an empirical study designed to test these propositions.

Literature Review

Job-related experience, job-specific skills, and training have a great deal of impact on an individual's job performance and the way a worker makes decisions about job-related matters. Research shows that experts approach problems differently from non-experts. Experts have better developed frames of reference, better skills at filtering out unimportant information, and better ability to judge the effectiveness of potential solutions (Plous, 1993). Thus, they are more efficient at designing, developing, testing and maintaining computer systems than non-experts. On the other hand, experts also have different goals and use different standards for evaluation.

Since experts are in control of the development process, their views have a great deal of influence on the end product. When it comes to the technical aspects of the design (i.e., use of database systems, communication technologies, security, operating systems, and programming) this is an advantage--they know more about these things than non-experts, such as consumers. But, when it comes to the design of the user interface, consumers are the ultimate judges of a web site's usefulness, ease of use, and overall effectiveness in accomplishing its goals. The difference between these two perspectives may be extremely important when the job of the experts is to design systems for use by non-experts, as in the case of people who design websites.

Effectiveness Criteria

Rational organizations engage in activities that are expected to benefit them in important ways, and web sites are designed with specific goals in mind. In general, advertising communications are designed to inform, persuade, and create a favorable impression of the sponsoring organization (Perloff, 1993). Examples of more specific criteria include sales revenue, repeat visits to the web site, the amount of time consumers spend on a web site, and consumer reactions to the web site. Consumers are also the best source of ratings on many other types of effectiveness criteria including measures of web page convenience (usefulness, ease of use, usability), attractiveness, ease of navigation, site content, receiver attitudes toward the communication method, and overall judgments of the effectiveness and satisfaction with the website. To some degree, most of these effectiveness criteria reflect the match between what the user hoped to achieve when visiting the web site and what he or she actually experienced. All of them represent judgments that are at least partly influenced by consumers' characteristics.

Web Site Characteristics

Web site characteristics also play a critical role in a web site's success in achieving the effectiveness criteria described above. For the purposes of this study we are interested in three types of web site characteristics: content, presentation modes, and convenience. Content refers to the nature of the information provided by the web site. This includes the topic area, the amount of information, the number of types of information, the number of sources, and the reading level associated with the information. Presentation mode reflects the fact that information may be presented in vivid or non-vivid, static or dynamic, and through one or more channels. It encompasses text, pictures, sounds, video clips, animations, and scrolling banners. Convenience has to do with interactivity, loading speed, and the ease with which users are able to locate information on the web site. This includes their ability to move between information located in various parts of the web site.

Although these categories all seem important, it is not clear which specific characteristics are most strongly related to effectiveness criteria from the consumer's point of view. There is reason to believe that the perceptions held by IT experts and non-experts may vary considerably. As IT experts learn about web site design they become sensitized to design elements that may go unnoticed by less experienced people. Through frequent exposure to web sites and by actively engaging in design processes, experts develop cognitive filters that help them process information about web site designs more quickly, efficiently and in a more sophisticated way than non-experts. In addition, experts and non-experts may have different motivations for visiting a web site. Compared with experts, non-experts would probably be more interested in the web site's information content. Their purpose for visiting a web

site would have more to do with the value of its information than the type of interface it uses. Therefore, compared with experts, non-experts' satisfaction with the web site and evaluations of the web site's effectiveness and usefulness should be more influenced by the amount of information contained on the web site, and its complexity. In contrast, experts who deal with web sites every day are probably more likely to focus on the design aspects of the web site, and less likely to pay a great deal of attention to the content. Their orientation has more to do with the characteristics of the media than the specific content.

Propositions

The discussion above leads to three general propositions about the differences between the perceptions of experts and non-expert consumers. Because non-experts are probably most representative of average visitors to a web site, the propositions are all concerned with their perceptions of web site usability, ease of use, usefulness, satisfaction, and effectiveness. First, given the same web sites, we expect IT experts to rate web sites as being less useful, less satisfying, and less effective than non-experts. Second, compared with ratings made by experts, non-experts' ratings of web site content (e.g., amount of information and information complexity) will explain more variance in the outcomes of usefulness, usability, ease of use, effectiveness, and satisfaction. Third, compared with ratings made by non-experts, experts' ratings of web site presentation mode and navigation will explain more variance in usefulness, usability, ease of use, effectiveness, and satisfaction.

Methods

Subjects

Two groups of college students will participate. Members of the first group, representing the IT experts, will include approximately 40 graduate students enrolled in an advanced course in web site design. The second group, representing non-experts (or typical visitors to a web site) will consist of approximately 400 students enrolled in initial undergraduate courses intended to familiarize them with the standard software available on personal computers maintained by the university. Undergraduate students with extensive IT experience will not be allowed to participate in the study. Based on previous research, (Van Scotter, et al., 2002), we expect both groups to contain about equal numbers of males and females, with about 60% being white, 30% African Americans, 5% Asians, and 5% from other backgrounds.

Procedures

A set of forty web sites was randomly selected from the Fortune 500 list of companies. Each member of the expert group will be assigned at random to judge the attributes of five web sites selected from the list of forty sites. No two experts will judge the same set of five web sites, but five experts will judge each web site. The order in which web sites appear on the lists of the five experts will be varied to control for biases caused by the order of presentation. A total of 400 non-experts (ten per web site) will also participate. Each non-expert will be asked to navigate one of the forty websites. Assignment to a web site will be at random. For the most part, experts and non-experts will answer he same questions regarding web site attributes and their reactions to the web site.

Instruments

Instruments developed for both experts and non-experts will collect information about the respondent's previous experience with internet web-sites (Novak, Hoffman, and Yung, 2000), and their perceived self-efficacy (Martocchio and Webster, 1992) for using the internet to accomplish their goals. However, the main focus of the questionnaire will be on perceptions of web site outcomes and three types of web site attributes: content, presentation, and convenience. Measurements reflecting a respondents' satisfaction with a web site and the web site's perceived effectiveness will be adapted from Van Scotter, et al.'s (2002) recent study examining differences in the outcomes experienced by receivers who received the same information over different communication channels. Davis' (1989) ease of use and usefulness scales will be used to measure those constructs.

Novak, Hoffman, and Yung's, (2000) scale will be used to measure the interactivity (speed) of the web site. Davis's (1989) ease of use measure will be adapted to form an ease of navigation measure for the present study. Measures of the information provided by a web site (e.g., amount of information, complexity of information, relevance, etc.) will be adapted from Van Scotter, et al.'s

(2002) study examining the affect of information attributes on receiver's comprehension and confidence in understanding message content. Measures of information specificity and uniqueness will be adapted from Barber and Roehling (1993).

Analysis

Obtaining multiple expert ratings will make it possible for us to assess the degree of expert agreement by computing interrater reliability estimates (e.g., Shrout and Fleiss, 1979). Common method variance can make it impossible to determine whether observed relationships reflect true relationships or are a by-product of the measurement process. It poses a serious threat to studies of within-person perceptions and outcomes. To avoid this problem altogether we designed this study as a cross-sectional study. The unit of analysis for tests of propositions 1-3 is the web site. Average ratings will be calculated for the expert and non-expert groups for each attribute included in the content, presentation, and convenience categories for each web site.

Our first research question regarding differences between experts and non-experts perceptions and evaluations of web pages, will be evaluated using ANOVA. For each dependent variable, separate ANOVAs will be used to compare the average expert ratings with the average ratings of non-experts across the forty web sites. Propositions 2 and 3 suggested that compared with expert ratings, the ratings of non-experts would explain more variance in non-experts (consumers) judgments of web site usability, ease of use, usefulness, effectiveness, and satisfaction. Information about each web site will come from the expert group described above and two groups of non-experts representing typical consumers. Two groups of non-experts will be formed by randomly dividing the group of 400 non-experts (ten per web site) into two groups of 200 non-experts (five per web site). For convenience we will label them as groups "A" and "B." Responses obtained from group "A" will provide the criterion data (e.g., measures of usability, ease of use, usefulness, effectiveness, and satisfaction) for the forty web sites. Average attribute ratings for the web site characteristics (predictor variables reflecting content, presentation, and convenience) will be obtained from group "B" and the experts. Hierarchical regression analyses will be used to test the relative ability of attribute ratings made by experts and non-experts (from group "B" only) to explain variance in criterion measures obtained from non-experts in group "A".

In tests of proposition 2, measures of web site content will be used as predictors. They include amount of information, information complexity, specificity, and realism. Following Cohen and Cohen's (1983) approach, the incremental variance associated with a set of variables will be determined by entering it in the regression model last and noting the increase in R^2. Sets of predictors that explain a significant amount of variance in the criterion measures over and above all of the other predictors are valuable because they explain important variance. On the other hand, sets of predictors that do not explain a significant amount of incremental variance have no value. The same approach will be used to test proposition 3, except that variables measuring various aspects of web site presentation mode and navigation such as interactivity (speed) and ease of navigation will be used to explain variance in the criterion measures (e.g., usability, ease of use, usefulness, effectiveness, and satisfaction) for the forty web sites. Hierarchical regression will be used to evaluate the relative contribution of expert judgments and non expert judgments (from group "B" only) in explaining variance in the criteria measures obtained from group "A".

Conclusions

The results of this study will reveal the types of website characteristics that have significant effects on perceptions of usefulness, usability, ease of use satisfaction and effectiveness judgments of non-expert consumers. Future research should focus on sets of predictor variables that make a significant difference in these dependent variables. By comparing the perceptions of three groups of respondents (experts, and two groups of non-experts) we should be able to eliminate most of the negative affects of common method variance.

Although this study is exploratory in nature, we do have a priori expectations about the results. For example, it is expected that information based attributes will be more important to web-site users than IT experts. It is assumed that experts will be more interested in the design features of the site rather than the information content. For example, using satisfaction as the dependent variable, we expect the amount of information, and perceived complexity to explain more variance in user satisfaction than IT expert satisfaction. Users are expected to focus more on content because it is more closely related to their purpose for visiting a web site than the web-site interface or other process issues. In contrast, we expect to find that IT people care more about process-related aspects of a web site than content issues, if process features are related to their reason for visiting the web site.

This study contributes to the literature by evaluating the relative influence of web site designers' and consumers' perceptions of web site attributes on judgments of web site usefulness, ease of use, satisfaction and effectiveness made by non-expert consumers.

Results may show that IT experts perceptions are: 1) different and relevant; 2) different, but not relevant; or 3) not different from non-experts perceptions. If the results support the first situation, then both IT experts and non-experts can provide valuable data to inform web site design. If results support situation 2 or 3, designers are probably better off listening to users when it comes to designing interfaces. The more variance in outcomes explained by non-experts perceptions, the more important it is for web site designers to solicit their opinions and to allow users views to guide design goals and the design process. This study extends previous work showing that differences in experience (Carlson and Zmud, 1998) and purposes for using information (Buller, 1986) are important predictors of effectiveness and other outcomes.

Acknowledgments

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