



# Web-STAR: A Survey Tool for Analyzing User Requirements for Web Sites

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## ABSTRACT

*The main goal of the Web-STAR (Web-Survey Tool for Analyzing Requirements) project is to provide a standardized survey tool which developers can use to determine the user requirements for existing or new informational web sites. The Web-STAR will allow this most vital stage in the development process to take place within a convenient, tested, and cost-effective framework. Based on existing work in user evaluation design, Web-STAR will take sound development practices and apply them to user requirements in the design of informational websites. This paper presents the research-in-progress development and testing of Web-STAR.*

## INTRODUCTION

User involvement in the development stage is critical to the success of a new information system (Hoffer, George, & Valacich, 2002). However, due to tight timelines for web development projects, users typically have been left out of the development process. Organizations are beginning to involve users in many different stages of their web development projects, as it has clearly been shown to improve the user experience. This can lead to an increase in repeat visitors and, in the case of e-commerce sites, higher sales. Examples of well-known companies and organizations that include user involvement in web development projects include Eastman Kodak, Indiana University, the National Institutes of Health, IBM, and the National Football League (Clarke, 2001; Corry, Frick, & Hansen, 1997; Lazar, 2003; Tedeschi, 1999; Yu, Prabhu, & Neale, 1998). This user input is necessary to determine user needs, both relating to the user interface (usability), and web site content (functionality). In certain types of web sites, namely e-commerce, search engines, and newspapers, tasks may be well defined (Lazar, Ratner, Jacko, & Sears, 2003). However, for the majority of informational web sites the user tasks are not well-defined and data collection (requirements gathering) needs to be done in order to determine what tasks the users actually need to perform. There are a number of different methods for user involvement in requirements gathering. Surveys are of interest here because they allow data to be collected from a large number of people in a short amount of time. A recent study found that the two methods used most often for requirements gathering for web site development are surveys and interviews (Lazar, Ratner, Jacko, and Sears, 2003). One of the strengths of surveys is that they can be distributed to a wide participant base and in a variety of formats such as paper, email, web site, or telephone (Lazar & Preece, 2001). However, one challenge in using surveys is the start up time required for creating, testing, and validating a survey. The goal of this paper is to present the research-in-progress development and testing, of a standardized survey tool that can be utilized in user requirements gathering for informational web sites.

## THE CHALLENGE OF REQUIREMENTS GATHERING

It takes more time and money to involve the users and understand their usability and task needs but the end result is a more appropriate system. The time required to create a survey for requirements gathering can be challenging. Part of the key to improving usability and user involvement for web sites

is to make the process easier for designers, by providing a toolkit (pre-tested surveys, interface guidelines, etc.) to assist them with user involvement. It is not as useful to tell designers to "build an interface that is easy to use," as it would be to say, "follow these 10 guidelines to make a good interface." Popular sets of interface heuristics, such as "Shneiderman's 8 Golden Rules of Interface Design" (Shneiderman, 1998), can help translate the large concept of interface design into something more concrete and manageable. Telling designers to "find out what the users need," is quite vague and difficult, but a survey tool that will help with understanding user needs is helpful to designers, and easy to implement.

The best way to encourage user involvement in the requirements gathering stage is to lower the cost (in time and effort) of doing so. Providing well-written surveys that have already been developed and tested can increase the likelihood that surveys will be utilized for user involvement. A number of surveys have already been developed in the field of human-computer interaction for evaluating existing user interfaces: QUIS (Harper, Slaughter, & Norman, 1997), WAMMI (Kirakowski, Claridge, & Whitehand, 1998), Information Quality Survey (Zhang, Keeling, & Pavur, 2000) and WEBMac, a series of surveys (Small & Arnone, 2000). While all of these surveys can assist with evaluating a system after it has been built, a review of the literature shows that no surveys have been created for assisting with the requirements gathering stage of web site development.

The goal of this research is to develop a survey tool that can be used for user requirements gathering in websites, and we have named this project Web-STAR, the **Web Survey Tool for Analyzing Requirements**. Though there are different types of web sites, such as e-commerce, informational, and entertainment (Lazar, 2003), the goal of Web-STAR is to assist with requirements gathering where it is needed most: for informational web sites where tasks are relatively undefined.

## SURVEY DEVELOPMENT METHODOLOGY

While no standardized survey tool exists for requirements gathering for web sites, there are a number of case studies where surveys were used for requirements gathering. This existing knowledge, as well as research on what influences people to return to web sites, was used to create the Web-STAR survey tool. Web-STAR can be used for both existing sites and sites under development. This is an important distinction as many web sites were not originally developed with user involvement, but include user involvement as they are redesigned (Lazar, 2003). The following topics were examined to find key areas in providing a good user experience on a web site: Web usability (Lazar, 2003; Nielsen, 2000), Motivational quality of a web site (Small & Arnone, 2000), User satisfaction (Harper et al., 1997), Information Quality (Zhang et al., 2000), Survey design (Oppenheim, 1992; Dillman, 2000), and Web accessibility (Paciello, 2000; Sullivan and Matson, 2000). The Web-STAR survey tool was developed in order to address the issues described in the above topical areas. In addition, based on examinations of web site re-design projects (Dong & Martin, 2000; Yu et al., 1998), it was determined that while some

questions would apply to both new web sites and re-designed sites, some questions would be unique to each. For example, it is important to evaluate the existing web resources for possible improvements, but this is by definition impossible if web resources have not yet been developed. Therefore, 50 informational web sites were examined by the research team to look for possible content categories, which could be helpful in determining what content might be useful on a site that does not currently exist. The 50 sites that were examined were chosen based on their inclusion in a previous research study (Lazar, Beere, Greenidge, & Nagappa, 2002), and the web sites represented 10 different categories of informational sites. Based on the content categories that were offered on those sites, the Web-STAR offers possible content categories for new sites.

The Web-STAR was designed with three main sections. The first section addresses data about the technological environment, browser version, and download speed of the users, as well as demographic information and previous computer experience. This data is important, regardless of whether a site is new or already exists (Lazar, 2003). The second section of Web-STAR addresses new web sites, by asking users what types of content would interest them on a new web site for an organization. There are three different types of responses in this section. Users are given the opportunity to examine the content categories from other representative web sites (such as schedule of events and contact information), to see if any would be useful. The designer can suggest possible content specific to this site (which would be written into the survey), to see if the users would be interested in such content. In addition, the users can suggest their own content, in an open-ended question. The third section of Web-STAR addresses currently-existing web sites. Users are asked to indicate how often they visit the currently-existing web site, their overall perceptions of the web site, as well as how they found out about the web site. In addition, there is a section where the developers can indicate existing content, giving users the opportunity to comment on how useful that content is, through the use of a likert scale.

## CURRENT RESEARCH STATUS

A prototype for Web-STAR has been created. This survey tool is currently being tested with 5 web development projects. From using the Web-STAR tool in a real-world setting, feedback will be available to improve the tool and validate its usefulness. In addition, information will be available on how the Web-STAR is used in web development projects. It is expected that, by the time of the IRMA 2003 conference, data on the usage of Web-STAR will be available for presentation.

## REFERENCES

- Clarke, J. (2001). *Key factors in developing a positive user experience for children on the web: A case study*. Proceedings of the Human Factors and the Web 2001, Available at: <http://www.optavia.com/hfweb/index.htm>
- Corry, M., Frick, T., & Hansen, L. (1997). User-centered design and usability testing of a web site: An illustrative case study. *Educational Technology Research and Development*, 45(4), 65-76.
- Dong, J., & Martin, S. (2000). *Iterative Usage of Customer Satisfaction Surveys to Assess an Evolving Web Site*. Proceedings of the Human Factors and the Web, Available at: <http://www.tri.sbc.com/hfweb/>
- Harper, B., Slaughter, L., & Norman, K. (1997). *Questionnaire Administration via the WWW: A Validation & Reliability Study for a User Satisfaction Questionnaire*. Proceedings of the WebNet97: International Conference on the WWW, Internet and Intranet, Toronto, Canada.
- Hoffer, J., George, J., & Valacich, J. (2002). *Modern systems analysis and design* (3rd ed.). Reading, MA: Addison-Wesley.
- Kirakowski, J., Claridge, N., & Whitehand, R. (1998). *Human centered measures of success in web site design*. Proceedings of the Human Factors and the Web, available at: <http://www.research.att.com/conf/hfweb/>
- Lazar, J. (2003, in press). *User-Centered Web Development* (2nd edition). Sudbury, MA: Jones and Bartlett Publishers.
- Lazar, J., Beere, P., Greenidge, K., & Nagappa, Y. (2002). Web Accessibility in the Mid-Atlantic United States: A Study of 50 Web Sites. *Submitted to the Universal Access in the Information Society*.
- Lazar, J., & Preece, J. (2001). Using Electronic Surveys to Evaluate Networked Resources: From Idea to Implementation. In C. McClure & J. Bertot (Eds.), *Evaluating Networked Information Services: Techniques, Policy, and Issues*. Medford, NJ: Information Today.
- Lazar, J., Ratner, J., Jacko, J., & Sears, A. (2003). User Involvement in the Web Development Process: Methods and Cost-Justification. Under Review.
- Nielsen, J. (2000). *Designing web usability: The practice of simplicity*. Indianapolis: New Riders Publishing.
- Oppenheim, A. (1992). *Questionnaire design, interviewing, and attitude measurement*. London: Pinter Publishers.
- Paciello, M. (2000). *Web Accessibility for People with Disabilities*. Lawrence, KS: CMP Books.
- Shneiderman, B. (1998). *Designing the User Interface: Strategies for Effective Human-Computer Interaction* (3rd ed.). Reading, Massachusetts: Addison-Wesley.
- Small, R., & Arnone, M. (2000). Evaluating the effectiveness of web sites. In B. Clarke & S. Lehaney (Eds.), *Human-Centered Methods in Information Systems: Current Research and Practice* (pp. 91-101). Hershey, PA: Idea Group Publishing.
- Tedeschi, B. (1999, August 30, 1999). Good Web Site Design Can Lead to Healthy Sales. *The New York Times*.
- Yu, J., Prabhu, P., & Neale, W. (1998). *A user-centered approach to designing a new top-level structure for a large and diverse corporate web site*. Proceedings of the 1998 Human Factors and the Web Conference, available at: <http://www.research.att.com/conf/hfweb/>
- Zhang, X., Keeling, K., & Pavur, R. (2000). *Information quality of commercial web site home pages: an explorative analysis*. Proceedings of the International Conference on Information Systems, 164-175

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