Automated Usability Questionnaire for Online Systems

GRADUATE PROJECT TECHNICAL REPORT

Submitted to the Faculty of
the Department of Computing and Mathematical Sciences
Texas A&M University-Corpus Christi
Corpus Christi, Texas

in Partial Fulfillment of the Requirements for the Degree of
Master of Science in Computer Science

by

Shannon Grizzell
Summer 2004

Dr. John Fernandez
Committee Chairperson

Dr. David Thomas
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Dr. Michelle Moore
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ABSTRACT

The purpose of this project is to apply usability principles to large scale projects such as corporate or university Web sites. During the course of this project an online usability questionnaire was constructed to address key usability items. A Web based framework was constructed to implement the questionnaire on the Web. A field trial of the Texas A&M University Corpus Christi Bell Library Web site was conducted. In addition, students from the Spring 2004 Human Computer Interaction graduate class tested and evaluated the questionnaire.
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1. BACKGROUND AND RATIONALE

Web-based systems are growing at an exponential rate. The World Wide Web has evolved from a collection of static pages to a dynamic environment that hosts full-fledged applications. These sites have not only become the public face of many businesses and institutions, but are increasingly becoming a primary vehicle for the dissemination of information and services within an organization.

The success of these Web applications is largely due to the satisfaction of those who use them. Subjective user satisfaction is a significant factor in the ultimate success of the set.

1.1 Formal Usability Methods

Usability principles derive primarily from formalized academic study of human computer interaction and industry-sponsored research. These principles are based on the study of several disciplines, including psychology, sociology, mental models, cognitive task analysis and others. The result is a scientifically sound, well documented foundation upon which to base the design of human-computer interfaces. The formal study of usability has established and reinforced many of the standard practices that are employed in user-centered Web design. Most of these standards help improve a user’s experience on a Web site when they are correctly applied. In much the same way that a reader can find his way around newspapers from different cities because most newspapers use conventions in their layout, Web users are better able to find their way around Web sites when conventions are properly used [Krug 2000]. Applying good usability principles at the outset of a Web site design project puts the development firmly on the right track to a useful, usable Web site.
As Krug points out, however, the real expert in usability is the user. Despite the best efforts of HCI experts and Web designers, the ones who ultimately determine if a Web site is useful (and therefore successful) are the users. Users, as a collective group, bring such a wide diversity of skill levels and backgrounds, that it is impossible for Web designers to address every technical or cultural nuance. Therefore, it is worthwhile to give the users a voice in the design of Web sites. One convenient way to do this is through some form of a questionnaire.

1.1.1 User’s Goals in “Surfing” the Web

Users normally enter a site looking for a particular piece of information or product rather than to simply admire the site. As Krug points out, users do not want to have to “figure out” the site; users come to a site because of what the site offers, not to interpret the user interface [Krug 2000]. For this reason, if a site does not allow them to quickly find what they are looking for, they move on. Web designers, on the other hand, are prone to become enamored with their design skills and technological novelties such as Macromedia Flash, forgetting that the user is not there to admire the design. While technologies like Flash can make the Web more accessible [Nielsen 2002], they can also be a temptation for designers to create bad design instead of usable substance, impeding usability. [Nielsen 2000a]

Since the cost, in terms of time and mental work, of choosing the wrong option is low, users will typically choose the first reasonable choice they find as they scan a page looking for desired information. If the link proves to be incorrect, the back button provides an easy way to return to a previous step in the search for another try. Still, frustration builds when users continually reach dead ends.
1.1.2 Self-Administered Usability Survey

Since the user is indeed the real expert, user perceptions need to be considered in addition to formal usability methods. Self-administered questionnaires are often used for this purpose. An automated usability survey is a self-administered questionnaire implemented in a Web environment, which will capture user input in a database for easier analysis. It allows the respondent to provide rating and feedback on specific elements of the Web site in question.
2. The Online Usability Survey Application (OUSA)

The Online Usability Survey Application provides a framework within which questionnaires can be created and published online. The application provides a questionnaire administration subsystem to manage questionnaires, individual questions and to summarize results as well as a questionnaire template subsystem to implement the questionnaire on the Internet and collect user responses. The application also includes a questionnaire designed to measure user’s satisfaction in several key usability areas.

2.1 Development of the Questionnaire

Even seasoned experts acknowledge that the development of a good, reliable questionnaire is far from an exact science [Peterson2000]. Using other questionnaires such as the University of Maryland User Satisfaction Survey [LAP 2003] as a model, a questionnaire was developed to measure user experience in the general area of Web usability.

2.2 Implementation of the Questionnaire

To implement the questionnaire online, an application was developed using the PHP server-side scripting language. PHP was chosen for its power and flexibility as well as its availability. PHP is open source software that may be freely downloaded from the Internet and is compatible with a number of Web servers. OUSA was developed using PHP version 4.2.2 and Apache 2.2.40 and questionnaire data tables and response data tables were stored in a MySQL database.
3. System Design and Research

3.1 Questionnaire Design

This first step in the project was to research and evaluate questionnaire construction and design principles. Books by Peterson [Peterson 2000] and Patten [Patten 1998] cover questionnaire construction principles in considerable detail. Once questionnaire design principles were considered, the content and focus of the questionnaire were addressed. Information from Nielsen [Nielsen 2000] and Krug [Krug 2000] provided the general categorical areas and specific issues upon which the questionnaire questions were based.

3.1.1 Question Types

In the construction of a questionnaire, there are three categories of questions, including introductory questions, substantive questions and classification questions. Introductory questions usually take the form of rapport questions, used to focus the participant’s attention and start them thinking about the questionnaire topic, or filtering questions, used to identify those who are of particular interest in a research project and eliminate those who are not. Introductory questions are seldom used in self-selected surveys [Peterson 2000]. For this reason there are no dedicated introductory questions as part of the Online Usability Survey.

The second category of questions is substantive questions. Substantive questions are designed to gather information critical to the research project. These questions focus on the key elements that the researcher wishes to measure.
The third category of questions is classification questions. These questions are used to determine a participant’s demographic or socioeconomic characteristics. They provide the information needed to group respondents by different characteristics and stratify research results accordingly.

In addition to the three basic categories of questions, there are two types of questions that may be included in a survey. They include open-end questions and closed-end question. Open-end questions do not provide predetermined answers or response categories; the respondent is free to answer in any way. An example of an open-end question might be: “What is your overall impression of this Web site?” While valuable information may be gained from responses to such questions, for the purpose of automated data collection, it would be extremely difficult to derive meaningful results from such responses.

For this reason, the Online Usability Survey uses primarily closed-end questions. Closed end questions are questions in which answer choices are provided to the respondent. Closed-end questions are generally easier for participants to answer [Peterson 2000] and are easier to analyze since answer choices are limited. An example of a closed end question from the Online Usability Survey is provided in Figure 3.1.

1. **Appearance:**

<table>
<thead>
<tr>
<th>Very Unprofessional</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>N/A</th>
<th>Very professional</th>
</tr>
</thead>
</table>

**Figure 3.1 – Survey Question Format**
3.1.2 Online Usability Survey Questions

There are a total of 36 questions in the Online Usability Survey, including 28 substantive questions and eight demographic questions. The survey is divided into five major sections addressing overall impressions, page design, content, navigation, and demographics of respondents. The survey employs a funneling approach in that the first section asks respondents some general questions about the site to focus attention on the various aspects the survey will address in later sections. While these questions are substantive in character, they also serve as introduction questions for the remainder of the survey. Funneling is a method whereby the survey instrument begins with general questions to evoke thought and then continues with increasingly specific questions [Peterson 2000]. Subsequent sections then focus on a particular aspect of usability such as the aesthetics of the screen display, the content of each page or article and navigation around the site. The complete questionnaire can be found in Appendix A.

The demographic section is designed to gather basic information about the respondents in order to analyze the data within a more meaningful context. Among the information gathered by the demographic section are the age bracket of the respondents, gender, their familiarity with the site (i.e. how often they use the site) and their general experience in using computers and internet browsers. These factors can influence their perception of the site under consideration.

The questionnaire was intentionally kept relatively short. Shorter questionnaires improve response rates which leads to more reliable results. Low response rates can produce misleading results because only the most committed users or those with the strongest opinions are likely to complete the survey. [Nielsen 2004] Nielsen points out
that the key to achieving the highest possible response rates is to make the survey as quick and painless as possible. By contrast, the University of Maryland’s full-length version of their questionnaire contains 128 questions in ten sections [LAP 2003]. It should be noted that although it is possible to implement the full-length version of the survey, in most cases only applicable sections are used.

3.1.2 Survey Introduction

The Online Usability Survey is, by nature a self-selected survey, that is participants decide for themselves whether or not they wish to participate. In all cases, but particularly in self-selected surveys, the potential participant should be given enough information so to make an informed decision as to whether or not they wish to participate. The introduction to a survey should also encourage participation by stressing the importance of the participant’s answers to the research questions.

In order to accomplish the above goals, an introduction should have a few key elements. First, the introduction should attempt to develop a degree of rapport with the participant. In the case of the online version of the questionnaire it is not practical to personalize the introduction to the participant, but the introduction can be personalized by including the name of the individual conducting the survey. The introduction should also provide enough information about the research project to allow potential participants to make an informed decision about participation. Third, the introduction should encourage participation. This may be in the form of a request for help such as “We would greatly appreciate your completing our brief survey.” Finally, the introduction should assure the participant of confidentiality. [Peterson 2000] The introduction provided for the Online Usability Survey, adapted for the Bell Library survey is shown in Figure 3.2.
Figure 3.2 – Bell Library survey introduction

3.2 Survey Structure

As previously stated the survey consists of a total of 36 questions in five sections. Each section has a section heading and all questions in that section relate to the section topic. These divisions help respondents focus their attention on the specific topic under consideration and help to give context to the questions being asked. Dividing the questionnaire into sections also helps to make the survey seem less lengthy. Figure 3.3 shows section 1 of the survey.
Figure 3.3 – Survey section 1
Each question provides a response scale with labels for negative and positive ratings. The Online Usability Survey uses a scale with 9 options. Each question is provided with an “N/A” answer in the event that the participant does not have an opinion or does not wish to answer the questions. Although Patten suggests keeping “Don’t Know” type answers to a minimum [Patten 1998], Peterson makes a stronger argument in suggesting that if the question is asked, an answer will be forthcoming. If a participant does not have an opinion or does not wish to answer the question, forcing the participant to answer the question on the 1-9 scale could skew the results. The “N/A” option also allows for the general usability survey to be applied to a variety of sites. Although ideally, questions that do not directly apply should be removed, if the participants perception is that the question does not apply the participant should not be forced for choose an arbitrary scale value.

3.2.1 Demographic Data

Demographic data is essential in interpreting the survey results. The goal of this section is to learn something about the respondent in order to best interpret survey responses. Factors which need to be considered include respondents’ computer skill level and the amount of time spent using the site. As in the substantive portion of the questionnaire, brevity is a plus here. Patten explains that too many demographic questions add to the overall length of the survey and may be perceived as intrusive by the respondent.

Because demographic data is personal and may be considered obtrusive, it is important to mitigate a participant’s reluctance to provide this data. One common technique is to place the demographics questions at the end of the questionnaire. Since
the respondent has already invested time in completing the rest of the questionnaire, they will be more likely to provide the requested demographic data than if they encounter these questions first. If, on the other hand, intrusive questions appear early in the questionnaire, the respondents are much more likely to refuse to participate since they have invested little time and effort. [Patten 1998, Miller 2002] Although the demographic portion of the Online Usability Survey does not contain highly personal questions, it has been placed at the end of the survey for this reason.

In terms of personal information, respondents are only asked to specify an age bracket from a list of 7 categories (Figure 3.4). They are also asked to specify gender. The remaining questions are less personal and deal only with the respondent’s experience with computers in general and the site in particular.

![Figure 3.4 – Age bracket selection](image)

Questions three and four of the demographic section are intended to measure the respondents’ familiarity with the site being surveyed. Question three (Figure 3.5) gauges how frequently the respondent visits the site, offering several choices. Question four (Figure 3.6) gauges the amount of time spent on the site per visit. Taken together, these two questions provide some insight into how familiar the respondent is with the site.
The last four questions are intended to measure the respondent’s experience with Web browsers and Internet use in general. Question five asks which browser the respondent uses most frequently while question six asks which other browsers the respondent has used. Users who have experience with a wider range of browsers are more likely to be technically savvy, a fact that can influence their perception of the site.

Finally, questions seven and eight provide insight into the mechanism through which the respondent views the site. Question seven, the type of connection to the Internet used by the respondent can have a direct bearing on issues such as response time. Question eight, the size of monitor used to view the site, can have a significant influence on screen layout and design issues. While screen size and resolution are not dependent on each other, smaller monitors usually operate at lower resolutions such as 600x800 or
While conventional wisdom [Nielsen 2000] says that sites should always be designed for the lowest resolution (600x800), many times this is not the case. As a result, the respondent’s “window” to the site is a worth-while consideration.

### 3.3 The Survey Application

The Survey Application consists of two elements: The questionnaire subsystem which is responsible for displaying the questionnaires and storing responses and the Administration subsystem which is used to manage existing questionnaires and create new ones. Both modules are built using PHP version 4.2.2 and hosted on Penguin, which currently runs the Apache Web Server version 2.0.40. Questionnaire data and user responses are stored in a MySQL database. Currently, Penguin is running version 3.23.52 of MySQL. Appendix B shows the entity-relationship diagram for the OUSA database.

The questionnaire module consists of four PHP files which performs four functions in administering a questionnaire.

### 3.4 PHP Implementation – Questionnaire Subsystem

The Questionnaire Subsystem consists of four PHP files which perform four functions in administering a questionnaire. These functions include displaying the introduction and receiving a user ID if required, displaying the questionnaire, storing responses and displaying a concluding or “Thank You” message.

#### 3.4.1 File index.php

The `index.php` file displays the appropriate “Welcome” message to the potential respondent. If applicable, it also provides a place for users to enter some form of identifying information such as student ID (see Figure 3.2). `index.php` then passes the site
identifier and the user ID to the actual questionnaire display template in the form of a cookie.

3.4.2 File qtemplate2.php

The questionnaire display template file, *qtemplate2.php*, reads the site ID value from the cookie and queries the database for the questions that belong to the particular questionnaire and section. If the section ID has not been set, the template assumes that the first section is to be displayed and sets the section variable to zero.

The questionnaire then displays the question text and response format for each question returned by the query. The respondent works through the questionnaire, checking the appropriate responses for each question. A text box can be placed at the bottom of each section for the respondent to make open comments about the topic of that section. When the respondent has finished answering the questions the “Next” button is clicked to submit the results.

3.4.3 File restate.php

When the section is submitted, the data is passed to *restate.php* which processes the results. This reads the cookies that have been set by the index page and the display template page to determine which questionnaire, site and section it is receiving data about. *Restate.php* then uses this information to query the database and determine which questions it is receiving answers to. Using the list of question IDs received from this query, then it loops through the data fields posted by the *qtemplate2.php* form and writes the questionnaire, section, question, user information and response data to the ‘responses’ table in the database.
After writing all responses to the database, `restate.php` checks the values of the `is_final_section` field in the `questionnaire_sections` table. If the value is ‘N’ `restate.php` increments the value of the `section_id` variable, updates the cooking and returns to `qtemplate2.php` to display the next section. If the value is ‘Y’ `restate.php` redirects to the `demographic.php` file.

3.4.4 File `demographic.php`

After all substantive question sections have been completed, `restate.php` directs the application to `demographic.php` to gather the respondent’s demographic data. `Demographic.php` is a static html form due to the fact that there are a number of different response types and answer values that are required. During testing, demographic data was stored in the `responses` table, however, this made analysis of the data along demographic lines more difficult. As a result, demographic data is now stored in the `respondents` table. This allows data about the respondents to be easily correlated to the respondent’s answers to their questions. Information collected on this form is passed to `processdemographic.php`.

3.4.5 File `processdemographic.php`

When the demographic section is complete, `processdemographic.php` receives the data and writes it to the respondents table. When this is complete, the application is redirected to `thankyou.php`.

3.4.6 File `thankyou.php`

The `thankyou.php` file is simply responsible for displaying the concluding or “Thank You” message to the user. A message confirming that the respondent’s answers
have been recorded and showing appreciation for their participation is recommended. At this point the respondent can close the browser or go to another web site.

3.5 PHP Implementation – Administration Subsystem

The Administration subsystem allows the OUSA administrator to create, modify, delete and publish questionnaires. To create a new questionnaire, the administrator first creates a bank of questions which will make up the survey. Then, a new questionnaire template is created. Once the template has been created, one or more sections can be added to the questionnaire template. Then questions are added to each section of the questionnaire.

To publish a questionnaire, the administrator creates a survey, which is an instance of the questionnaire template that is associated with a particular site ID. In the case of the Bell Library survey, the site ID is ‘bell-lib’. This site ID is recorded with each response record to associate that response with the site. The site administrator will be provided with a link which can then be provided to the site owner, allowing them to link to the survey directly from their web site. The survey link is the OUSA URL with the site ID as a URL parameter. For example: www.sci.tamu.edu/ousa/index.php?siteid=bell-lib. The site ID cookie is set by the index page based on this URL parameter. The following sections discuss each element of the administration subsystem. Appendix C provides a site diagram for the administration subsystem.

3.5.1 File login.php

Login.php provides a simple form for questionnaire administrators to enter a username and password. This information is passed via cookie to verify.php to check the information against the users table in the database.
3.5.2 File verify.php

*Verify.php* receives a user name and password from *login.php* via cookie and then queries the database to determine if the user name and password combination is valid. If the information is verified, the *verify.php* page sets a login cookie which expires when the browser is closed. Each page of the application includes a file called *verify_login.inc* as an included file to assure that the individual trying to access the page is properly logged in. If the login cookie cannot be verified, the user is redirected to *login.php*.

3.5.3 File admin.php

*Admin.php* provides the main menu for the Administration Module of the online survey application. The menu provides options to manage questionnaire templates, manage the question database, publish a survey or view results of existing surveys.

![Figure 3.7 – Administrative Menu screen](image-url)
3.5.4 File templatemanager.php

Templatemanager.php is the center of the questionnaire management section of the Administration subsystem. From this screen, survey administrators can create a new questionnaire template from scratch or edit existing questionnaire templates. Choosing the Create New Questionnaire option takes the users to the newquestionnaireform.php form. This form provides space for the user to enter a questionnaire title and creator name as well as a general introduction and concluding remarks for the questionnaire.

Templatemanager.php also provides an option to edit existing questionnaires. This options takes the user to edit_select_questionnaire.php which provides a list of existing questionnaires with which the user can work.

![Questionnaire Template Manager screen](image)

Figure 3.8 – Questionnaire Template Manager screen
3.5.5 File newquestionnaire.php

*Newquestionnaire.php* provides a form for users to enter the data necessary to create a new questionnaire template from scratch. The form includes space for the questionnaire title, questionnaire creator’s name and space for a questionnaire introduction and concluding remarks.

When *newquestionnaire.php* loads, it first queries the *questionnaires* table to determine the last *questionnaire_id* value. This value is incremented by one to serve as the ID number for the new survey. The new ID value, along with the text entered by the user is passed to the action page *writequestionnaire.php*. The new questionnaire form is shown in Figure 3.9.
3.5.6 File writequestionnaire.php

Writequestionnaire.php receives form data from newquestionnaire.php. Before writing the data to the questionnaires table, writequestionnaire.php creates a timestamp based on the server’s clock. The script then writes the data to the questionnaires.php table. After executing the insertion query, the script verifies that the write operation was
successful. If successful, the script redirects the user to writequestionnaireconfirm.php. If the write operation fails, the script displays an error message to the user.”

3.5.7 File writequestionnaireconfirm.php

After a successful write operation writequestionnaireconfirm.php notifies the user that the write operation was successful and provides a link back to the templatemanager.php page.

3.5.8 File edit_select_questionnaire.php

Edit_select_questionnaire.php provides a list of all questionnaires stored in the OUSA database. The user can use this list to edit the basic questionnaire information such as the title, creator or introduction text by clicking on the questionnaire title. The user can view or edit sections by clicking on the document icon. Finally, the user can delete the entire questionnaire, including all sections by clicking the trash can icon. The questions are not removed from the questions table when the survey is deleted. The questionnaire selection page is shown in Figure 3.10.

3.5.9 File edit_form_questionnaire.php

Edit_form_questionnaire.php provides a form to modify questionnaire information. This page is identical to newquestionnaire.php with one exception. The edit form receives a questionnaire ID from edit_select_questionnaire.php and uses this ID to query the questionnaires table for the questionnaire information. The script prepopulates the form fields with the data from the questionnaires table. When the user clicks the Submit button, the data is passed to updatequestionnaire.php where the data is written back to the questionnaires table. If the write operation is success, the script redirects the users to writequestionnaire_confirm.php to inform the user that the write was successful
and provide a link back to the questionnaire manager. If the write is not successful, the script displays an error message.

![Edit Questionnaires screen](image)

**Figure 3.10 – Edit Questionnaires screen**

### 3.5.10 File editsectionmenu.php

When the user clicks on the document icon in the **Edit** column on the *edit_select_questionnaire.php* page, *editsectionmenu.php* queries the database to retrieve all sections for the questionnaire ID that is passed via URL parameter. Sections are displayed in the order in which they will appear on the actual questionnaire implementation (Figure 3.11). The list also shows the **Last Section** indicator, stored in the *is_last_section* field of the *questionnaire_sections* table. This field determines when the questionnaire template redirects to the demographic section. The page also provides edit and delete functions for the individual sections. When the user clicks the document
icon in the **Edit** column, the `editsectionquestions.php` page loads and displays the questions included in that section as well as providing an option to add questions from the questions table. The trash can icon allows the user to delete the section and all questions that are included in the section.

![Figure 3.11 – Edit Sections Menu screen](image-url)
3.5.11 Editsectionform.php, updatesection.php, updatesectionconfirm.php files

Editsectionform.php, updatesection.php, updatesectionconfirm.php function very similarly to the modules to edit questionnaire data discussed above. Editsectionform.php receives a questionnaire and section ID via URL parameter and queries the questionnaire_sections table in order to prepopulate the form data for the user to edit. The data is then passed to updatesection.php to write back to the database. Finally, updatesectionconfirm.php notifies the user of a successful write and provides a link back to the template manager.

3.5.12 File editsectionquestions.php

Editsectionquestions.php receives questionnaire and section ID values via URL parameters and queries the database to display questions included in this section. The file also provides a means to add questions to the current sections. When the user click on the Add Question link or the plus icon, addsectionsquestion.php loads, allowing the user to select from a list of all available questions to add to the current section. The user can also delete questions from the current section by clicking the trash can icon. This runs the script on the deletequestion.php, removing the question from the database and returning to editsectionquestions.php.

3.5.13 File addsectionquestion.php

Addsectionquestion.php functions similarly to editsectionquestions.php in that it receives questionnaire and section ID values via URL parameters and queries the database to display questions included in this section. Additionally, the script queries the questions table and displays all available questions below the list of questions currently included in the section with a plus sign next to each. When the user click on the plus icon,
addquestion.php executes, adding the question to the current section and returns to addsectionquestion.php to display the question list with the new question added to the current section.

3.5.14 File deletesectionconfirm.php

Deletesectionconfirm.php executes when the users clicks the trash can icon on the editsectionmenu.php page. When this script executes, it queries the database to determine how many questions are included in the section and warns the user that the delete operation cannot be undone. The warning includes the title of the section and the questionnaire of which it is a part as well as the number of questions in the section. The user must then click Yes in order to complete the delete operation or No – Take me back! to return to the editsectionmenu.php page. If the user clicks Yes, deletesection.php executes, deleting the section from the sections table and all assigned questions from the questionnaire_questions table.

3.5.15 Newsectionform.php, writenewsection.php File

From the editsectionsmenu.php page, if the user clicks Add New Section, newsectionform.php loads to provide a form for entry of section data. The script queries the database to determine the last section number and increments that value by one for the next section number. The user data and the new section ID are passed to writenewsection.php which inserts the data into a new record in the questionnaire_sections table in the database.

3.5.16 Deletequestionnaireconfirm.php, deletequestionnaire.php file

From the edit_select_questionnaires.php page, when the user clicks the trash can icon to delete the entire questionnaire, the deletequestionnaireconfirm.php page is
presented. Since creating a questionnaire requires the creation of several individual sections, with individual questions added to each one, this confirmation and warning is provided to help prevent accidental deletions. A warning is displayed informing the user that the operation cannot be undone. The name of the questionnaire is displayed along with the number of sections and the number of questions included. As in the delete module for individual sections, the user must click Yes to proceed with the delete operation or No – Take Me Back! to return.

3.5.17 File questionmanager.php

The Question Management section of the Administration subsystem allows administrators to create and delete individual questions which can later be added to sections. Question management is separated from questionnaire management to facilitate the reuse of questions on multiple questionnaires instead of forcing the user to reenter the question each time it is used in a survey.

Questionmanager.php queries the database and presents the user with a list of all questions currently stored in the database. The question text is displayed above the scale labels to allow the user to easily see and understand the question. Clicking on the question text takes the user to editquestion.php which allows the user to revise the question. At the end of the question list, there is an Add Question link to allow the user to add new questions to the database.

3.5.18 File editquestion.php

The editquestion.php page provides a form to allow the user to edit the question text, scale labels or response scale of an existing question. The script queries the questions table to retrieve data on the question ID received as a URL parameter from
questionmanager.php and populates this data for the user. When the user submits the form, updatequestion.php writes the data back to the questions table and returns to the question management section.

3.5.19 File newquestionform.php

Newquestionform.php provides the user with a blank form to enter a new question. The script first queries the database to determine the last question_id and increments this value by one. When the user submits the form, the data is passed to writenewquestion.php which inserts a new record into the questions table.

3.5.20 File publishsurveymenu.php

Publishsurveymenu.php allows the administrator to publish a new survey using an existing questionnaire template or to modify an existing survey. A survey is an instance of a questionnaire that is associated with a particular Web site.

3.5.21 File publishsurveyform.php

Publishsurveyform.php provides the Administrator with a blank form to enter data necessary to create a new survey. The administrator must enter and alphanumeric site ID without space and choose a questionnaire template to use for the survey. This data is then passed to writenewsurvey.php which stores the data in the surveys table.

3.5.23 File analysismodulemenu.php

Analysismodulemenu.php gives survey administrators the ability to view survey results in summary format or by individual response details. The administrator chooses which survey to view and either summary or detailed results. The script then loads the proper page.
3.5.24 File analysissummary.php

*Analysissummary* displays responses to the chosen survey in a tabular format.

Summaries displayed by question and major demographic division.

3.5.25 File respondedetails.php

*Respondedetails.php* provides essentially a dump of the user responses. This screen is intended to provide raw survey data to the administrator without having to write SQL queries in the database. This data can be saved as a text file and then manipulated in a spreadsheet program.
4. EVALUATION AND RESULTS

Both the questionnaire and the online application have been tested. Testing for the questionnaire included a pretest with the Spring 2004 Human Computer Interaction graduate class and a survey of the Bell Library Web site. The online application framework was used to implement both of these surveys.

4.1 Questionnaire Testing

The only means of assuring that a questionnaire measures what researchers intend for it to measure is to test it before implementing the full survey. Statistical analysis of the results can tell the researcher whether the questionnaire appears to be reliable and accurate. The Online Usability Survey questionnaire was tested using the following procedures.

4.1.1 HCI Class Pretest

The semester project for the spring 2004 Human Computer Interaction class was to develop a Web site for a client and test the site on a small group of users. Students tested each others Web sites and provided feedback on the usability of the site. The Online Usability Survey was used as the feedback instrument for this exercise. After each student completed the online survey, students were asked to complete a hand-written survey about the online survey (Appendix D). Students were asked their opinion on several key areas of the online survey. A summary of the results appears in Figure 4.1.
Overall, the perceptions of HCI students indicate the questionnaire covers the basic elements of Web usability in an understandable and succinct manner.

### 4.1.2 Bell Library Survey

Christine Shupala, Library Director for the Bell Library agreed to participate in a field trial of the Online Usability survey. The library’s Webmaster added a link to the survey on the library’s main page (Figure 4.2) and an email was sent to faculty asking for participation.
The survey was conducted from April 26, 2004 through May 15, 2004. A total of 38 people responded to the survey. The distribution of respondents by age bracket was relatively even as shown in Figure 4.3.

<table>
<thead>
<tr>
<th>Age Bracket</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-24</td>
<td>5</td>
</tr>
<tr>
<td>25-31</td>
<td>6</td>
</tr>
<tr>
<td>32-38</td>
<td>3</td>
</tr>
<tr>
<td>39-45</td>
<td>8</td>
</tr>
<tr>
<td>46-52</td>
<td>4</td>
</tr>
<tr>
<td>Over 52</td>
<td>5</td>
</tr>
<tr>
<td>NA</td>
<td>7</td>
</tr>
<tr>
<td>Grand Total</td>
<td>38</td>
</tr>
</tbody>
</table>

Overall those in the 18-24 and 39-45 age groups gave the highest rating to the site, 7.86 and 6.77, respectively. Figure 4.4 shows the average rating and standard deviation for each question for all respondents.
The average rating is the measure of the respondent’s satisfaction with the site in each area. For all questions, the library’s site received an average rating of 6.33 with a standard deviation of 2.04.

The standard deviation of responses is a good indicator of the reliability of a question. Questions with higher standard deviation in responses may indicate that the question is interpreted very differently from respondent to respondent. Question 20, regarding movie files for example has a standard deviation of 2.73. Respondents had considerably different interpretations of how to answer this question, particularly in light of the fact that there are no movie files on the library site. Since the question measures a non-existent attribute of this site, the standard deviation of responses in this survey is not necessarily an indicator of an unreliable question. As Peterson pointed out [Peterson 2000] if a question is asked the respondent will try to answer the question.

<table>
<thead>
<tr>
<th>qid</th>
<th>Question</th>
<th>n</th>
<th>Average</th>
<th>StDev</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Overall Appearance (Very Unprofessional - Very Professional)</td>
<td>37</td>
<td>6.46</td>
<td>1.77</td>
</tr>
<tr>
<td>2</td>
<td>Page Layout (Very Unorganized - Very Organized)</td>
<td>39</td>
<td>6.05</td>
<td>1.87</td>
</tr>
<tr>
<td>3</td>
<td>Service or Information provided by this site (Unclear - Clear)</td>
<td>38</td>
<td>6.32</td>
<td>1.79</td>
</tr>
<tr>
<td>4</td>
<td>Search Function (Unhelpful - Helpful)</td>
<td>36</td>
<td>6.06</td>
<td>2.06</td>
</tr>
<tr>
<td>5</td>
<td>Getting around this site (navigation) (Difficult - Easy)</td>
<td>39</td>
<td>5.87</td>
<td>1.77</td>
</tr>
<tr>
<td>6</td>
<td>Response Time. Pages load (Very Slow - Very Fast)</td>
<td>39</td>
<td>6.11</td>
<td>2.04</td>
</tr>
<tr>
<td>7</td>
<td>Text on page (Hard to Read - Easy to Read)</td>
<td>35</td>
<td>6.09</td>
<td>1.96</td>
</tr>
<tr>
<td>8</td>
<td>Color Selection (Unhelpful - Helpful)</td>
<td>33</td>
<td>6.62</td>
<td>2.26</td>
</tr>
<tr>
<td>9</td>
<td>Useful information on the screen (Inadequate - Adequate)</td>
<td>35</td>
<td>6.67</td>
<td>2.06</td>
</tr>
<tr>
<td>10</td>
<td>Amount of screen space used for navigation (Too little - Too much)</td>
<td>34</td>
<td>6.41</td>
<td>1.89</td>
</tr>
<tr>
<td>11</td>
<td>Amount of screen used for ads (Too little - Too much)</td>
<td>12</td>
<td>5.17</td>
<td>1.54</td>
</tr>
<tr>
<td>12</td>
<td>Layout from page to page is (Inconsistent - Consistent)</td>
<td>34</td>
<td>6.94</td>
<td>2.04</td>
</tr>
<tr>
<td>13</td>
<td>Information on the page is (Poorly organized - Well organized)</td>
<td>33</td>
<td>6.36</td>
<td>2.03</td>
</tr>
<tr>
<td>14</td>
<td>Placement of ads on the page is (Very distracting - Not Distracting)</td>
<td>12</td>
<td>6.42</td>
<td>2.19</td>
</tr>
<tr>
<td>15</td>
<td>Content on this site is (Poorly written - Well written)</td>
<td>34</td>
<td>6.71</td>
<td>1.68</td>
</tr>
<tr>
<td>16</td>
<td>Page titles reflect content (Poorly - Very Well)</td>
<td>34</td>
<td>6.91</td>
<td>1.90</td>
</tr>
<tr>
<td>17</td>
<td>Article headlines are (Confusing - Informative)</td>
<td>27</td>
<td>6.36</td>
<td>1.76</td>
</tr>
<tr>
<td>18</td>
<td>Graphics and images are (Unhelpful - Helpful)</td>
<td>23</td>
<td>6.21</td>
<td>2.57</td>
</tr>
<tr>
<td>19</td>
<td>Animations are (Unhelpful - Helpful)</td>
<td>15</td>
<td>6.07</td>
<td>2.40</td>
</tr>
<tr>
<td>20</td>
<td>Movie files are (Unhelpful - Helpful)</td>
<td>23</td>
<td>6.50</td>
<td>2.73</td>
</tr>
<tr>
<td>21</td>
<td>Getting around this site is (Very Difficult - Very Easy)</td>
<td>35</td>
<td>6.11</td>
<td>1.83</td>
</tr>
<tr>
<td>22</td>
<td>Determining where you are within this site is (Very Difficult - Very Easy)</td>
<td>35</td>
<td>6.29</td>
<td>1.92</td>
</tr>
<tr>
<td>23</td>
<td>Getting back to the home page of this site is (Difficult - Very Easy)</td>
<td>35</td>
<td>6.66</td>
<td>2.17</td>
</tr>
<tr>
<td>24</td>
<td>Links are (Difficult to identify - Easy to Identify)</td>
<td>34</td>
<td>6.29</td>
<td>2.54</td>
</tr>
<tr>
<td>25</td>
<td>Link colors are (Unhelpful - Helpful)</td>
<td>23</td>
<td>6.43</td>
<td>2.53</td>
</tr>
<tr>
<td>26</td>
<td>Distinguishing unvisited links from visited links is (Impossible - Very Easy)</td>
<td>31</td>
<td>5.97</td>
<td>2.40</td>
</tr>
<tr>
<td>27</td>
<td>Links are predictable - they lead where I expect them to (Almost Never - Almost Always)</td>
<td>33</td>
<td>6.00</td>
<td>2.36</td>
</tr>
<tr>
<td>28</td>
<td>How often do you find links that do not work? (Often - Never)</td>
<td>30</td>
<td>7.13</td>
<td>2.18</td>
</tr>
</tbody>
</table>

Figure 4.4 – Bell Library Survey Average ratings
Another example, question 26 – Distinguishing unvisited links from visited links – has a standard deviation of 2.40. This variation could be the result of difference of opinion about hyperlink coloration or a difference in interpreting the question. In such a case the question may need to be reworded for clarity or more than one question may be necessary.

Another way to determine the reliability of questionnaire questions is to examine the distribution of respondents’ answers on the response scale. Figure 4.5 show the distribution of responses for the Bell Library survey.

**Figure 4.5 – Distribution of Responses**

When responses are clustered closely together, this is a good indication that the question is reliably measuring what it is intended to measure. Question one on overall appearance and question ten on navigation are good example of questions where responses are clustered closely together. This indicates a high likelihood that respondents interpret and respond to the question in the same way, making the result more dependable.
4.2 Online Implementation Testing

Both parts of the survey application have been tested as well. The questionnaire template portion was used to implement the survey in both the HCI class pretest and the Bell Library survey. As a result of one small issue during the first day of the HCI pretest, a time stamp was added to user responses. Otherwise, the questionnaire template performed as designed.

The Administration subsystem has also been thoroughly tested. Numerous questionnaires have been created, modified and deleted in the development environment. The normal process that a questionnaire administrator will use to create questionnaire template and implement a survey was followed in the creation of these test surveys.

First, questionnaire templates were created with a title, author and introductory and concluding text. Then sections were added to each survey, each with its own title and optional instructional text. Next questions were added to each section of each questionnaire. Questions, sections and entire questionnaire templates were deleted to assure that each process worked correctly.

Finally, survey implementations were created using the questionnaire templates and tested with the questionnaire template. Results pages were tested with test data as well as library survey data to assure that each worked correctly.
5. Future Work

The Online Usability Survey Application is designed as a basic framework to implement questionnaires online. The questionnaire itself is designed to be a general measure of respondents’ subjective perception of a Web site. The questionnaire could easily be expanded to cover wider range of topics and to address current topics in more detail. Existing questions, particularly those with high standard deviation values could be modified and further tested for reliability. The questionnaire template could be expanded to support other response type in addition to the numeric scale currently available.
6. Conclusion

The goal of this project has been to develop a means of surveying Web users to determine their perceptions and satisfaction with a given Web site via an online tool. This project has successfully developed a questionnaire that covers the fundamental areas of Web usability as well as the necessary components to implement the questionnaire online. In addition to this, tools have been developed to easily modify the questionnaire or implement brand new questionnaires from scratch. This was accomplished through researching social science research principles and developing a Web-based application in PHP to drive the questionnaire presentation and data collection process.

The importance of Web usability will continue to increase as business, educational and personal uses of the Web grows. Formal usability methods are an important part of usability studies, however, subjective user feedback about individual perceptions and users’ satisfaction must be considered as well.


Appendix A – OUSA Questionnaire

Overall Impressions of the Site
Please select the number that best reflects your impression of the site.

1. **Appearance:**
<table>
<thead>
<tr>
<th>Very Unprofessional</th>
<th>Very professional</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5</td>
<td>6 7 8 9 N/A</td>
</tr>
</tbody>
</table>

2. **Layout:**
<table>
<thead>
<tr>
<th>Very Unorganized</th>
<th>Very Organized</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5</td>
<td>6 7 8 9 N/A</td>
</tr>
</tbody>
</table>

3. **Services and Information provided by the site:**
<table>
<thead>
<tr>
<th>Unclear</th>
<th>Clear</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5</td>
<td>6 7 8 9 N/A</td>
</tr>
</tbody>
</table>

4. **Search Function**
<table>
<thead>
<tr>
<th>Unhelpful</th>
<th>Helpful</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5</td>
<td>6 7 8 9 N/A</td>
</tr>
</tbody>
</table>

5. **Navigation (Getting around the site)**
<table>
<thead>
<tr>
<th>Difficult</th>
<th>Easy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5</td>
<td>6 7 8 9 N/A</td>
</tr>
</tbody>
</table>

6. **Response Time (pages load)**
<table>
<thead>
<tr>
<th>Very slowly</th>
<th>Very quickly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5</td>
<td>6 7 8 9 N/A</td>
</tr>
</tbody>
</table>

7. **Help with this Web site is**
<table>
<thead>
<tr>
<th>No where in sight</th>
<th>Readily Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5</td>
<td>6 7 8 9 N/A</td>
</tr>
</tbody>
</table>
Appendix A – OUSA Questionnaire

Page Design

1. **Text on the screen**

<table>
<thead>
<tr>
<th>Hard to Read</th>
<th>Easy to read</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 N/A</td>
<td></td>
</tr>
</tbody>
</table>

2. **Color Selection**

<table>
<thead>
<tr>
<th>Unhelpful</th>
<th>Helpful</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 N/A</td>
<td></td>
</tr>
</tbody>
</table>

3. **Amount of useful information on screen**

<table>
<thead>
<tr>
<th>Inadequate</th>
<th>Adequate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 N/A</td>
<td></td>
</tr>
</tbody>
</table>

4. **Amount of screen used for navigation**

<table>
<thead>
<tr>
<th>Too much</th>
<th>Too little</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 N/A</td>
<td></td>
</tr>
</tbody>
</table>

5. **Amount of screen used for ads**

<table>
<thead>
<tr>
<th>Too much</th>
<th>Too little</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 N/A</td>
<td></td>
</tr>
</tbody>
</table>

6. **Layout from page to page is**

<table>
<thead>
<tr>
<th>Inconsistent</th>
<th>Consistent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 N/A</td>
<td></td>
</tr>
</tbody>
</table>

7. **Information on the page is organized**

<table>
<thead>
<tr>
<th>Poorly</th>
<th>Well</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 N/A</td>
<td></td>
</tr>
</tbody>
</table>

8. **Placement of Ads on the page is**

<table>
<thead>
<tr>
<th>Very distracting</th>
<th>Not distracting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 N/A</td>
<td></td>
</tr>
</tbody>
</table>
### Appendix A – OUSA Questionnaire

#### Content

1. **Information on this site is**
   - Poorly written
   - Well written

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poorly</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Well</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
</tbody>
</table>

2. **Page Titles reflect content**
   - Not well
   - Very well

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not well</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Very well</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
</tbody>
</table>

3. **Article Headlines are**
   - Confusing
   - Informative

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confusing</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Informative</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
</tbody>
</table>

4. **Graphics and images are**
   - Unhelpful
   - Helpful

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unhelpful</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Helpful</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
</tbody>
</table>

5. **Animations are**
   - Unhelpful
   - Helpful

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unhelpful</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Helpful</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
</tbody>
</table>

6. **Movie files are**
   - Unhelpful
   - Helpful

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unhelpful</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Helpful</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
</tbody>
</table>
Appendix A – OUSA Questionnaire

### Navigation

1. **Getting around this site is**

<table>
<thead>
<tr>
<th>Very difficult</th>
<th>Very easy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 N/A</td>
<td></td>
</tr>
</tbody>
</table>

2. **Determining where you are within this site is**

<table>
<thead>
<tr>
<th>Very difficult</th>
<th>Very easy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 N/A</td>
<td></td>
</tr>
</tbody>
</table>

3. **Get back to the home page of this site is**

<table>
<thead>
<tr>
<th>Difficult</th>
<th>Very easy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 N/A</td>
<td></td>
</tr>
</tbody>
</table>

4. **Links are**

<table>
<thead>
<tr>
<th>Difficult to identify</th>
<th>Easy to identify</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 N/A</td>
<td></td>
</tr>
</tbody>
</table>

5. **Link colors are**

<table>
<thead>
<tr>
<th>Unhelpful</th>
<th>Helpful</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 N/A</td>
<td></td>
</tr>
</tbody>
</table>

6. **Distinguishing unvisited links from visited links is**

<table>
<thead>
<tr>
<th>Impossible</th>
<th>Very easy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 N/A</td>
<td></td>
</tr>
</tbody>
</table>

7. **Links are predictable – they lead where I expect them to**

<table>
<thead>
<tr>
<th>Almost never</th>
<th>Almost always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 N/A</td>
<td></td>
</tr>
</tbody>
</table>

8. **How often do you find links that do not work?**

<table>
<thead>
<tr>
<th>Often</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 N/A</td>
<td></td>
</tr>
</tbody>
</table>
Appendix A – OUSA Questionnaire

Demographic Questions:

1. Age:

2. Gender
   M [ ]  F [ ]

3. How often do you visit this web site?

4. On average, how much time do you spend per visit to this web site?

5. Which browser do you use most frequently?
   - [ ] Internet Explorer
   - [ ] Netscape
   - [ ] Mozilla
   - [ ] AOL
   - [ ] Opera
   - Other - Please Specify:

6. Which other browsers have you used?
   - [ ] Internet Explorer
   - [ ] Netscape
   - [ ] Mozilla
   - [ ] AOL
   - [ ] Opera
   - Other - Please Specify:

7. How do you connect to the internet: dial-up or broadband (cable/DSL)
   - [ ] Dial-up
   - [ ] DSL/Cable
   - [ ] LAN

8. What size of monitor do you use to view this web site?
   - [ ] 13-15 inch
   - [ ] 17-19 inch
   - [ ] 21 inch or larger
   - [ ] Don’t know
Appendix C – Administration Subsystem Site Diagram
Appendix C – Administration Subsystem Site Diagram

questionmanager.php

ediquestion.php    updatequestion.php

deletequestion.php

newquestionform.php    writenewquestion.php

publish_survey.php

publishsurveyform.php    writenewsurvey.php

analysismodulemenu.php

analysismodulesummary.php

respondendetails.php
Appendix D – HCI Class Evaluation Questionnaire

Assessment of Online Usability Survey Questionnaire

Please take a few moments to visit the online Questionnaire at the address below and answer the following questions. Your input as HCI professionals is appreciated. If you have questions, please email me. shannon@grizzell.info
www.sci.tamucc.edu/~sgrizzell/

1. Does the questionnaire sufficiently cover the major factors of web usability?

2. Do the sectional divisions help to clarify usability factors. What alternative divisions would you suggest?

3. What additional factors should be included in the questionnaire?

4. Are questions worded clearly?

5. Is the terminology used in questions and response categories clear?

6. Which terms might be changed to improve understanding by the average (non-technical user)? What alternatives can you suggest?

7. Are answer choices appropriate for each question?

8. Are there any unnecessary questions?

9. Does the demographic section provide adequate background to assess respondents’ opinions based on their level of expertise and experience with the site being evaluated?

10. What other suggestions can you provide to make the questionnaire a more effective tool for user feedback?