Easy Survey Creator
Project Proposal

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24 February XXX

Introduction

The Psychology Department at the University of Iowa makes extensive use of surveys or questionnaires as a means of collecting data from participants for the various studies being conducted by faculty or students within the department. Within the last year, there has been an increased interest expressed in placing some of these surveys on the Internet rather than mailing hard copies to the research participants. Although this approach leads to many added efficiencies for the researchers, it places an added burden on the department's IT Support Staff, which is responsible for creating separate interfaces and databases for each survey. Due to the time-consuming nature of this process, it often takes longer for the survey to be placed online than the researchers are willing to wait to begin their study. In response to this, we are proposing the development of a new piece of software that will help to expedite this process by allowing online surveys to be easily created and administered by anyone within the department, including those who have no programming knowledge. This document outlines the details of that proposal, including motivation for undertaking such a project, as well as details concerning the project environment, the specific challenges that are expected to be encountered during development, the deliverables of the project, and the estimated development schedule.

Motivation

Prior to the requests to collect responses to questionnaires over the Internet, many of the labs within the Psychology Department did (and still do) gather their data by requesting that participants in their studies fill out paper copies of the surveys. Depending on the particular study, this either requires that survey packets be mailed to the participants at home or that the participants come to the psychology building to fill out the survey there. These surveys are generally designed so that they may be scanned into a special software program that recognizes the responses and saves the data in a format that can then be imported into SPSS for analysis. It is not hard to see that this process, although effective, is costly and time consuming as it leads to the expense of postage and photocopies as well as many hours of work for the lab assistants responsible for scanning the forms so that the data is available in an electronic format for analysis.

In response to this, several of the professors and graduate students within the department have requested to conduct their studies via the Internet by asking their participants to fill out a form online rather than on paper. Several of these online surveys have been created in the last year and they seem to be meeting the needs of the researchers quite well. The problem with this approach lies with the fact that creating such a survey requires a significant amount of time from someone with knowledge of web programming and databases. With the average survey consisting of at least 100 questions, each with 10 radio buttons to record the response, one can imagine how long it takes to create the interface alone. Currently, the estimated time for completion of such a project is about three weeks from the date it is first requested, which, in several cases, has proven to be longer than the researcher can wait before starting to collect data for their study. Additionally, this process is leading to a support nightmare as each survey has been developed by a different student employee (all of which will have graduated by this May) using different languages, DBMS's, and technologies. This creates a tremendous learning curve for those responsible for supporting these applications next fall.

In an attempt to solve or avoid some of these problems, we are proposing the development of an Easy Survey Creator that will allow a survey to be defined easily and quickly even by those with no programming knowledge. A variety of programs that attempt to achieve something similar to this are already in existence. One example is published by WISCO Computing and is simply titled "Survey Software." [1] The software requires a GUI to be installed in the individual computers of those wishing to use it and, although it does have a web component, it doesn't sound as though it has been thoroughly tested and approved in a Windows environment as knowledge of Perl is highly recommended. Another alternative is QuestionPro.com [2], which provides a web interface to define the questionnaire, hosts the survey while gathering responses, and provides a variety of analysis tools online as well as via exports to Microsoft Excel or SPSS. Although this package does almost everything required by the department, the $899 per user license fee for 15 to 20 users becomes quite costly for as few of the features as most of the researchers in our department would use. Additionally, due to the requirements of the Institutional Review Boards (IRB) [3] that oversee all of the studies on campus making use

of human subjects, it is unlikely that it would be approved to store data about participants on a server not administered by and located at the University. A third alternative is a software package called WebSurveyor [4], which is currently licensed by ITS for use by other departments within the University. The product is marketed for use with WebSurveyor's hosting service, although server software is also available that would allow the Psychology Department to store the results of their studies on University-owned hardware. Although we have not yet had an opportunity to meet with ITS to discuss the details of the licensing fees for this application, the prices quoted online start at $3000 for an individual server license, which is not alone prohibitive. It does, however, appear that this server software allows only one survey to be active at a time, meaning that the faculty and students within the department would have to take turns collecting data for their studies, which makes this solution less attractive for use by the Psychology Department. A final product, which appears to be the most promising of all of the alternatives investigated, is SelectSurveyASP [5]. This web-based tool sounds as though could be easily deployed on the web server currently used by the Psychology Department and the $200 price tag is quite affordable. The only obvious drawback to this solution (as well as all of the other profession survey packages discussed) is that the interface is not intuitive and easy to use due to the sheer number of features that have been implemented within the application. Due to the fact that a primary goal of this software is to make the creation of online surveys simple and non-intimidating, we are hesitant to provide a solution that is not as intuitively obvious to use as possible. That being said, however, it is probably true that purchasing a piece of survey software developed by a third party is a more cost effective solution in the long run than writing a custom application.

In light of all of this, we are choosing to develop Easy Survey Creator software that will be customized to the current needs of the Psychology Department with the goal of making it as easy as possible for the faculty and students to design their own online surveys. We are then encouraging the Psychology Department to pursue a purchased alternative at some point in the future should online surveys be embraced by the researchers to the extent that they require the additional functionality provided by commercial applications and are willing to devote the time required to learn the software so that they may find the "workarounds" necessary to make programs primarily designed for use with marketing research meet needs that are more specific to psychology research (such as security requirements or subject pool membership, as described later in this document).

Project Summary

The primary goal of this project is to expedite and simplify the process of using a web form rather than a paper form to collect responses to surveys. This will be accomplished by providing a web interface which can be used by anyone in the Psychology Department to specify the format of the survey questions and responses. This same application will then be responsible for retrieving and displaying survey definitions for participants as well as recording their responses to the various survey questions. Finally, the project will include a web interface for the researchers to easily retrieve the results of their survey at any time in a Microsoft Excel format, which can be easily imported into SPSS for analysis. All of the survey definitions and responses will be stored in a single database and controlled by a single application, so the challenge of supporting a completely separate application for each survey will be eliminated. Additionally, the web interface will help to simplify the process of creating an online version of the survey, which will mean that anyone can create a survey with or without help from the IT Support Staff and that significantly less time will be required from the time a request is made to put a survey on the Internet to the time the first response is saved to the database.

Project Details

Architecture and Environment

The Easy Survey Creator application and database will be hosted on the Psychology Department server (aegean.psychology.uiowa.edu), which is a Dell PowerEdge server running Microsoft Windows Server 2003 Standard Edition. In an effort to remain consistent with the majority of applications previously developed within the department, this program will be written in C# using ASP.NET. Microsoft Visual Studio 2003 will be used as the development tool and Microsoft SQL Server 2000 will be the DBMS for this project. The Easy

Survey Creator will be driven by data from the SQL Server database, which will hold all information concerning survey definitions and responses, as well as by information about users of the program, which is currently maintained in Active Directory and will be used within this program to enable application security.

Faculty and students affiliated with the Psychology Department will have access to the Easy Survey Creator via the department's internal website where they will be able to create and administer surveys as well as retrieve the results of any studies with which they are affiliated. These results will be downloaded in the form of an Excel spreadsheet which can easily be imported into SPSS for statistical analysis. Participants in the various studies within the department will be able to access the surveys via the department's external website by following a URL given to them by the researchers. Since one requirement for this URL is that it be easy to remember and read over the phone, the address that participants enter will actually map to a virtual directory in IIS that will then redirect to the much less user friendly URL where the survey definition will be loaded from the database and responses will be saved back to the database by the Easy Survey Creator application. Please see the following diagram for further clarification.
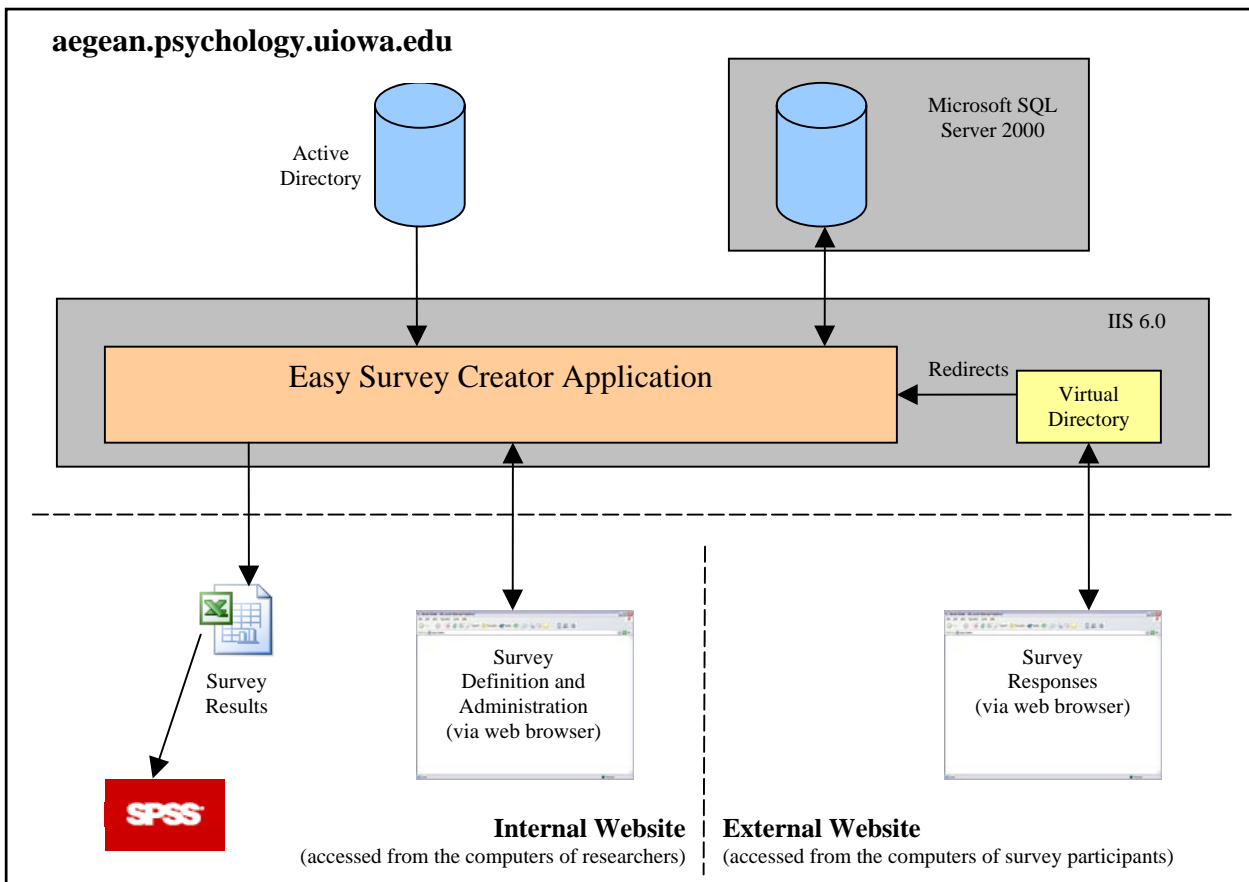

Figure 1: Architecture for the Easy Survey Creator

Implementation Issues and Challenges

Up until this point, for both paper surveys and those we have put on the web, the faculty and graduate students have had complete say on how the survey is formatted, how the responses are organized, what colors are used, etc. Everything we have done has been completely customized to meet the needs of a particular study. Although time-consuming, this process is not necessarily challenging. One of the biggest challenges with the Easy Survey Creator application is that it needs to be able to support the same variety of options that the researchers are used to so that it may be used with just about any survey in the department. Thus, the template on which each survey is based as well as the database that holds the survey definitions and responses must be flexible enough to accommodate a wide variety of question and response types appearing in any order on the

survey. This makes the design of the interface and the database a tremendous challenge because it must allow the user to do just about anything they would like while still storing the data in a way that makes sense and presenting it to the user in a manner that is easy to absorb and intuitive to use. Thus, one of the hardest aspects of developing this application will probably be the design issues concerning providing a standard survey template that is highly configurable and modifiable.

Additional challenges will be presented by the Institutional Review Boards (IRB) concerning what types of information may be collected from participants. It has already become clear that there will be a need for each survey to be reviewed before it is placed on the Internet to ensure that the researchers are requesting only the types information that the IRB has approved for that study. The IRB also enforces restrictions concerning who can view the data collected for each study. Thus, application and database security become important issues. It will be necessary for the owner of each survey to be able to specify in the survey definition which other members of the Psychology Department should be given the ability to view the results. Due to the fact that all of the information about users is stored in Active Directory, it makes sense to use this as the source for the directory used by the researchers to specify who else may view their survey responses. Integrating this into the Easy Survey Creator application in a way that will be easy to use, however, is likely to be challenging because it will require features such as a directory look-up interface or validation that a particular user account exists and is active within the system.

Deliverables

The three main deliverables associated with this project are the database that will be used to hold survey definitions and responses, the web application that will interact with the database in order to provide an interface for administering surveys and storing responses, and, as time allows, documentation and training for those within the Psychology Department so that the application can be easily supported and used even when those involved with the development are no longer around.

The first of these deliverables is the database that will hold all information pertaining to the surveys generated using the Easy Survey Creator application. Although all of this information will be held in a single database, it can be thought of as containing two somewhat separate sets of tables. The first of these will hold information about each of the surveys created using the software. There will be information stored about the survey in general (such as who the principal investigators are) and there will also be a record of each item included in the survey. For example, a survey may consist of text instructions followed by multiple choice questions, a page break, and an essay question. For each of these, the database will keep track of the order in which they appeared in the survey and information relevant to that item, such as the question text or the options that are listed for the multiple choice questions. The second set of tables within the database will hold the responses gathered for a particular study, keeping track also of information such as the time and day when the participant filled out the survey or the subject pool with which they are identified (pro-life or pro-choice for a survey on abortion, for example). The design of a single database to hold all of this information will help to reduce the challenge and frustration of understanding a different database schema each time a change to a web survey is requested. Instead, understanding the layout of one database is all that is needed to work with any of the surveys created using this program.

The second deliverable for this project is the web interface that will allow the surveys to be defined, responses to be gathered, and results to be downloaded. This portion of the project is expected to be the most time consuming and is, therefore, divided into three phases. The first phase will produce an interface to specify the survey definition. This will allow the researcher to choose from the available question types, provide any multiple choice options required, and specify the order in which the questions, text, or page breaks appear in their survey. It will also allow them to specify information concerning the administration of their study, such as the start and end date for their survey or which other individuals in the department have access to view the results. The second phase of development for the web interface will provide the ability to store survey responses in the database. This will require that the survey definition be retrieved, that the survey be built based on that definition, and that the responses given by participants be recorded in the database. One requirement for

this portion of the program is that the URL be easy to remember and read over the phone, so it is expected that one of the trickiest pieces of this phase will be setting up a mechanism to redirect requests for a user friendly URL to the Easy Survey Creator application with a parameterized URL. The final phase of interface development will provide a way for the researchers to download the results of their study from the internal website. This will be accomplished by reading the responses from the database, formatting them as a table, and exporting them in Microsoft Excel format. The only challenge associated with this piece of the development should be ensuring that the responses are downloaded in a format that makes analysis easy, which may require that the user specify a value to be recorded in the database that is different than what is displayed to the user (a numeric value that corresponds to a text value for a multiple choice question, for example). Providing such a web interface will offer the primary benefit of reducing the amount of time required to prepare a survey for the Internet as it will automatically build the survey form based on the questions and definitions provided. It will also provide significant time savings for the various labs within the Psychology Department by eliminating the need to manually scan each survey in order to retrieve the responses as the results of each study will automatically be available in an electronic format. Finally, it will offer a convenience factor for participants who will no longer be required to mail their responses back to the researchers or make a trip to the University to fill out the surveys.

The final deliverable for this project will be completed given that there is enough time at the end of the semester. It includes additional documentation and training for individuals in the Psychology Department. This may include making sure that the code has an ample amount of comments so that it is easy to maintain, providing further documents and diagrams for the IT Support Staff that will be responsible for application maintenance, giving noon hour presentations to the faculty and staff in the Psychology Department to demonstrate the use of the program, providing online user manuals, or adding context sensitive help features to the application. Providing any or all of this documentation and training will make the experience of using the Easy Survey Creator more intuitive for faculty and students and will help to make the job of supporting the application less time consuming for the IT Support Staff.

Timeline

Based on the deliverables previously described, an estimated development schedule for this project is as follows:

24 February 2004	Project Proposal due
5 March 2004	ER Diagram and Database Schema Design complete
26 March 2004	Easy Survey Creator application, Phase I complete
12 April 2004	Easy Survey Creator application, Phase II complete
19 April 2004	Easy Survey Creator application, Phase III complete
30 April 2004	Project tested and deployed
6 May 2004	Project due.

Conclusion

In response to numerous requests from faculty and graduate students, the IT Support Staff for the Psychology Department has recently been working to provide an online version of many of the surveys used for various studies within the department. Although conducting a survey over the Internet offers a variety of efficiencies and benefits for the researchers, it has turned out to be a time consuming proposition for the IT staff who must create each application and database separately. Additionally, the amount of time required to prepare a survey for use on the Internet has proven to be longer than some of the researchers are able to wait to begin their study. In response to this problem, the Easy Survey Creator application and database described in this proposal will provide an efficient alternative to creating each survey as a separate web application with responses stored in separate databases. By providing an intuitive interface for specifying the survey definition, this program will not require the user to have any programming knowledge or background and will reduce the amount of time required to create an online survey. Formatting the results as an Excel spreadsheet that can be downloaded at

any time will provide further time-savings by allowing the data to be imported directly into SPSS for analysis. Additionally, providing a single database that will be used to store all of the survey definitions and responses will help to alleviate the burden of supporting numerous online survey applications by requiring the support staff to become familiar with only a single database schema. Finally, the documentation and training that will be supplied as time permits will help both the IT Support Staff and the faculty and students of the Psychology Department to become familiar with the new survey software so that they may use and support it more efficiently and with greater ease.

References

[1] WISCO Computing. *Survey Software from WISCO Computing.* Retrieved February 10, 2004, from
    http://www.wiscosurvey.com/
[2] QuestionPro.com. *Survey Software*. Retrieved February 10, 2004, from   http://www.questionpro.com/
[3] The University of Iowa Human Subjects Office. *Institutional Review Boards (IRBs).* Retrieved February
    10, 2004, from http://research.uiowa.edu/hso/index.php?get=irb_main
[4] WebSurveyor. *WebSurveyor*. Retrieved February 22, 2004, from http://www.websurveyor.com/
[5] ClassApps. *SelectSurveyASP.* Retrieved February 22, 2004, from
    http://www.classapps.com/SelectSurveyASPOverview.asp