Creating Web Based Surveys with Zope - An Open Source Application Server

By Dr. Rich Herrington, Research and Statistical Support Services Manager

Web based surveys are becoming more popular as an alternative to conventional surveys. A major reason for this is cost. In Figure 1. we see that an Internet based survey is always cheaper by a substantial margin:

Figure 1. From "Using the Internet for Quantitative Survey Research", by James H. Watt (1997).

Additional reasons for implementing a web-based survey include the speed with which: 1) a survey can be created, 2) a survey can be distributed, 3) the data can be collected and put into a form which can be analyzed. Furthermore, as survey data are collected, the survey can be modified if problems arise during the survey process. Potential drawbacks with internet surveys can involve biased survey responses if the population under study is not representatively sampled via an internet medium.
Implementing a Web Survey

The typical approach to implementing a web survey will usually involve a combination of HTML and CGI programming. This can potentially involve a fairly substantial skill base: administering a webservice, HTML programming skills, and Perl or Python programming skills. Many web-based services exist in taking care of the server administration functions and will even provide survey creation tools for a fee (e.g. survey monkey). In Table 1., a comparison of the strengths and weaknesses of the different survey technologies is provided:

Table 1. From "Using the Internet for Quantitative Survey Research", by James H. Watt (1997).

<table>
<thead>
<tr>
<th>feature</th>
<th>E-Mail</th>
<th>Converted CATI</th>
<th>Converted Disk-By-Mail</th>
<th>Web CGI Programs</th>
<th>Web Survey Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ease of creation / modification</td>
<td>Excellent</td>
<td>Fair</td>
<td>Good</td>
<td>Poor</td>
<td>Excellent</td>
</tr>
<tr>
<td>Ease of Access to Preliminary Data</td>
<td>Poor</td>
<td>Fair</td>
<td>Good</td>
<td>Excellent (w/ extra programming)</td>
<td>Excellent</td>
</tr>
<tr>
<td>Sample Quota Control</td>
<td>Poor</td>
<td>Excellent</td>
<td>Fair</td>
<td>Excellent (w/ extra programming)</td>
<td>Excellent</td>
</tr>
<tr>
<td>Data Validity Checks</td>
<td>Poor</td>
<td>Good</td>
<td>Good</td>
<td>Excellent (w/ extra programming)</td>
<td>Excellent</td>
</tr>
<tr>
<td>Demand of Respondent’s Attention</td>
<td>Excellent</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Personalization of Questionnaires</td>
<td>Fair</td>
<td>Fair</td>
<td>Poor</td>
<td>Excellent (w/ extra programming)</td>
<td>Excellent</td>
</tr>
<tr>
<td>Conversion of Existing Questionnaires</td>
<td>Fair</td>
<td>Excellent</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Expertise Required by Questionnaire Creator</td>
<td>Low</td>
<td>High</td>
<td>Moderate</td>
<td>Very High</td>
<td>Moderate</td>
</tr>
<tr>
<td>Cost per completion</td>
<td>Inexpensive</td>
<td>Expensive</td>
<td>Expensive</td>
<td>Very Expensive</td>
<td>Moderate to Inexpensive</td>
</tr>
</tbody>
</table>

In the subsequent portions of this article, we examine the use of an open source web application server (Zope), and an open source Zope based survey application (QSurvey), in providing HTML based survey services here at the University of North Texas.

Zope

Zope is a web publishing system. It consists of an optional webservice, a middle layer which coordinates getting things into and out of the database, and an object database. You can leave out the webservice and run Zope behind Apache or IIS. Zope is designed to, and excels at, publishing dynamic content. If you have a three page website, Zope is overkill. If you have hundreds and thousands of pages, lots of users, and impatient readers, Zope is a very good thing. Zope is also open-source, which is crucial to its success. (Zope is actually an acronym: it stands for Z Object Publishing Environment.) The programming languages used to build Zope are Python and C. Most of Zope is written in Python, and any bits where performance is crucial have been rewritten in C. Zope has been described as Python's
killer application; that is, the one application that makes it well worth learning Python and which best shows off the power of Python. In summary:

**Zope (Z Object Publishing Environment)**

- Originally Used for Newspaper Publishing
- Zope is Based on Python; Cross-Platform
- Zope uses an Object-Oriented Web development Model
- Content, Logic, & Presentation are separated

**Component Features**

- ZServer + Apache - Can be used alone or in conjunction with Apache
- Through-the-Web Management - Zope Management Interface (ZMI)
- Integrated Control: Undo, Security
- ZODB + SQL Database Adaptor - Built in Object Database and API's for Popular Databases
- Built-in Search Tools: ZCatalog
- Safe Delegation: acl_users folder allows management of usernames and passwords
- Extensible Modules: Products - QSurvey is one example

Next, we look at a particular Zope application - QSurvey.

**QSurvey**

The QSurvey product is designed to make on-line surveys easy to write. Instead of having first to develop the backend for the storage, then adapt the questions to the storage available, this product allows you to concentrate on the survey and its questions. Zope takes care of the storage. The page-centric model with optional branching determines at run-time which page to display next. If you need more than simple questions, you may include DTML Document material interspersed with your questions. This means that Images and other content are allowed inside a QPage.

**QSurvey features:**

- A page-oriented model, with the QSurvey holding QPages, and QPages holding DTML Documents and Questions.
- Multi-page interaction is possible with branching dependent on the values of a multiple-choice question.
- All Multiple-Choice are a single type. Select listbox, radio, checkbox, formatting from a single "options" tab.
- Ordering of things within a page from a management tab in the QPage object.
- Pays attention to AUTHENTICATED_USER for results ID creation.
- RESULTS available in various tab-delimited formats.

Screen shots of the Zope and QSurvey web interfaces can be found at the UNT short course notes web page.

**Example of a QSurvey Survey**

The following is an example survey created with QSurvey:
## Organization of course

- Poor Performance
- Below Average Performance
- Average Performance
- Above Average Performance
- Excellent Performance
- Other

If you replied "Other" to the question above, please describe:

- [Input field]

## Knowledge of subject

- Poor Performance
- Below Average Performance
- Average Performance
- Above Average Performance
- Excellent Performance
- Other

If you replied "Other" to the question above, please describe:

- [Input field]

Click here to continue to the next page of questions
Please click the button below to submit your completed survey

Thank you for participating

Click here to submit your completed survey

Resources

If you are interested in attending a short course devoted to Zope and QSurvey, contact Claudia Lynch. If you are interested in obtaining a Zope account on the UNT Zope survey server http://web2survey.unt.edu/, contact Rich Herrington. Enjoy the holidays!