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Producing a TEX/LATEX Online Survey with the eqExam Package

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1 Introduction

On January 31, 2005, I published a **TEX/LATEX Online Survey** at

`http://www.math.uakron.edu/~dpstory/eqExam/tex_survey.pdf`

and invited the TEX community, through the `comp.text.tex` forum, to participate in this unofficial survey of TEX usage. The survey was created from a LATEX source, the final document was in Adobe's Portable Document Format (PDF). The purpose of this article is to describe how the survey was created and to report on some of the results.

Because of the limitation of Acrobat technology and browser plug-in architecture, the survey can be only submitted to a server-side script in the following environments:

- **Windows Platform:** Adobe Reader 5.0 or later viewed inside a browser; Adobe Reader 6.0 or later outside a browser.
- **Mac Platform:** Adobe Reader 6.0 or later viewed outside a web browser; Adobe Reader 7.0 or later inside a web browser.
- **Linux/Unix Platform:** The survey cannot be submitted from a PDF at all, in versions of Adobe Reader prior to version 7.0; the survey can be submitted with Adobe Reader 7.0.

The results reported here will be preliminary, *the survey is ongoing*. The plan is to wait a significant period of time following the recent release of Adobe Reader 7.0 for Linux in hopes of including responses from this platform.

2 The eqExam Package

For many years, I've used my own LaTeX package to construct the tests, quizzes and homework assignments for my classes at the University of Akron. Recently, I fixed a number of bugs, integrated it with the **AcroTeX eDucation Bundle** and enhanced the overall capability of the package.[1] The eqExam package is now publicly available for download at the eqExam package home page[2] and from CTAN.

The package can be used to create multiple choice, true/false and fill-in questions, as well as questions that require an extended response. The package has a number of interesting features,[3] what separates eqExam from the other exam packages,[4] however, is its support for PDF.

With regard to PDF, there are several package options, `pdf`, `links`, `online` and `email`, the author can select. Here, we discuss only the `email` option. When the option `email` is taken, Acrobat form elements are inserted into the document creation workflow, and the document becomes interactive when viewed as a PDF from within the Adobe Reader: the alternatives of a multiple choice question become radio button fields; for a true/false or short fill-in question, the blank spaces (usually underlined) left to write in the response are changed into text fields designed for input; and for a long response question, the vertical space left for the student to write into becomes a multi-line text field.

As the name of the option suggests, the eqExam submits the form data to a server-side script that, in turn, sends the data as an email attachment to the recipient, whose email address is specified in the form data. For this purpose, I wrote a server-side script, called `eqAttach.asp`,[5] to perform the tasks just described.

In the preamble of the LaTeX source of an eqExam document with the `email` option, the following command is required:

```
\SubmitInfo{http://www.myWebSite/scripts/eqAttach.asp\#FDF}
    {myname@mymailprovider}
```

This command inserts a submit button at the top of the first page. The first argument is the URL to the server-side script, the second is the email address of the individual to receive

[1] `http://www.math.uakron.edu/~dpstory/webeq.html`

[2] `http://www.math.uakron.edu/~dpstory/eqexam.html`

[3] The eqExam itself is not the focus of this article, see the related article "Creating Online Tests with eqExam", in **The PracTeX Journal**.

[4] For example, exam by Philip S. Hirschhorn; and examdesign by Jason Alexander

[5] This script is distributed with the eqExam package.

the respondent's data. (You can also provide a comma delimited list of email addresses to have multiple recipients.[6])

The script file `eqAttach.asp` must be installed on a Windows server platform, running Microsoft Internet Information Server(IIS), version 4.0 or greater.

The incoming data from an eqExam document has the file structure in the Acrobat Form Data Format (FDF). To handle the incoming FDF from the client, `eqAttach.asp` uses the **Acrobat FDF Toolkit**,[7] version 6.0, which is a library of function calls to handle FDF. The **FDF Toolkit** needs to be installed on the server.

Details of the script and toolkit installation can be found in the eqExam package documentation.[8]

3 The TEX/LATEX Usage Survey

An eqExam document does not actually have to be a test, it can be any list of questions which requests the response of the user, a teacher evaluation, a questionnaire, or a survey. The **TEX/LATEX Usage Survey** was developed, then, to demonstrate this very useful ancillary feature of any exam package, and of my package, in particular.

The survey was divided into five parts:

1. **TEX/LATEX**: The TEX/LATEX part sought information about experience, length of time using TEX of the respondent, what TEX and platform system is used.

2. **Seeking Help**: The respondent is queried about help with TEX problems, where does the respondent go to get help?

3. **Print and PDF**: Print and PDF concerns whether the respondent primarily uses TEX to print documents, or to create PDF documents for distribution.

4. **Population Demographics**: Here, questions such as gender, age, country or residence are asked of the respondent.

5. **Improvements in TEX**: One question asking the respondent to note any improvements needed to TEX systems.

[6] For example, one copy to the professor, and one to a graduate student who will grade the exam.

[7] Located at the **Acrobat Family Developer Center** `http://partners.adobe.com/public/developer/acrobat/devcenter.html`.

[8] `http://www.math.uakron.edu/~dpstory/acrotex/eqexamman.pdf`

The questions themselves were mostly multiple choice, with a few short fill-ins and extended replies thrown in for good measure.

Before making the survey public, one safeguard was put in place. A respondent can only submit twice per platform. It is very easy to submit, just click on the "Submit" button; a nefarious individual could click hundreds of times, spoiling the survey results, wasting bandwidth, and filling up my email in-box, hence the restriction.

Gathering the Data. The way eqExam is designed to work with the `email` option, the server-side script, `eqAttach.asp`, receives the form data from the client, creates an email message, attaches the data as a FDF file, and sends the message to the designated recipient. As the recipient of the survey results, I've received 195 emails to date. The attachments were saved to a folder on my desktop for later processing as they arrived.

Now, how do we take the 195 FDF files, extract the form data, and save the data to a database? There is a new feature of Adobe Acrobat 7.0 Professional that I used to handle this problem. Under the `File > Form Data` menu, there is an item in the drop-down menu titled "Create Spreadsheet from Data File…". I selected this item, in the subsequent dialog, I chose all the FDF files in the folder were I kept the survey results, and Acrobat did the rest. Upon completion, Acrobat produced a `.csv` file, a comma delimited file that Microsoft Excel can read. I opened the new file in Excel and saved it as a `.xls` file, and subsequent to that, I imported the Excel file into the MS Access database program, for easy data manipulation.

Data Highlights. The TEX/LATEX survey—having been constructed from an eqExam, a general exam package—is not "intelligent"; the survey is linear, the respondent simply reads each question in turn, and answers as appropriate, there is no validation of the data (for example, require a number be entered). I have constructed quite sophisticated surveys using LATEX, one for Seybold Seminars[9] and another for Adobe Systems. In both surveys, I used the full power of the **AcroTEX eDucation Bundle** and of Acrobat JavaScript.

A fairly complete report of the results of this survey can be found in the two files `tex_survey_rep.pdf` and `longresp.pdf`.

The survey was publicized through `comp.text.tex`, which lead to 195 responses to the survey. The responses to Question 1 report that 8.2% classified themselves as novices in TEX/LATEX, 28.6% were intermediates, 50.5% classified themselves as experienced, and 12.6% were package developers. The vast majority of respondents, 85% said they preferred to use LATEX (Question 4(a)).

[9] `http://www.planetpdf.com/mainpage.asp?webpageid=2130`

Question 5 asked the respondent what operating system they used with TEX/LATEX. According to the survey, 54.9% used a Windows-based platform, about 13% use a Mac, and 21.5% use Unix or Linux. This statistics maybe somewhat misleading, as people who use Linux could not respond on Linux, so the number of respondents that favor Linux is probably low in this sample.

I was asked to include some questions about usage of CTAN and the TEX FAQ (Questions 7 and 8). The survey said that 162 respondents had heard of CTAN, and 105 of these used CTAN once or twice per week. The rest use CTAN more often than that. For the TEX FAQ (`http://www.tex.ac.uk/faq`), 141 out of 195 indicated they had heard of the FAQ, and 118 had actually used it. The average number of times FAQ is used, within the group of individuals who have used FAQ, is 5.87 times per year.

Question 12 asked about whether TEX/LATEX was used primarily to print documents, or for the creation of PDF. We see from the survey results, 65.3% responded by saying "about half and half", 14% said exclusively for print, and 20.4% said exclusively for PDF.

In terms of gender and age of the respondents, 159 said they were male, and 10 female (Question 14), while the average age of respondents was 30.9 years.

Reviewing the responses to Question 17, we see that the survey had a good international flavor to it, though most respondents came from North America and Europe.

The extended response Question 20 (What you most like to see improved in TEX/LATEX?) is quite informative. Developers of TEX systems need to study these responses to better understand user's needs.

Conclusions. To date, there are only 195 responses, so it's premature to infer too much; I would like the sample size much larger. One problem I see is reaching TEX/LATEX users. Hopefully, with the publicity surrounding this article, and, perhaps, with the aid of the international TEX User's Groups, there will be increase in the number of individuals taking the survey. I would like to get the number up over 1000.

Two things that strike me are the gender and age of the respondents. The vast majority were male, and the average age was about 31. Could this be an early sign of a problem with getting more females and younger individuals involved with TEX/LATEX?

The TEX community has not done much surveying their users. I think it is important to the future of TEX to recruit more users, to know what people think about TEX systems, what their problems are, and how they are using the application. In any case, the data are there for anyone to inspect and to draw whatever conclusions that may seem appropriate.