FileMaker Pro and the world wide web:

Tools for estimating

by Dr. Thomas Bates and Dr. Mark Snyder

The process of estimating costs for printing production has evolved from being a manual process to one that is totally computerized. Today, instructors who would like to make a computerized estimating system available to their students have a number of avenues that they might follow. In this article, the authors will describe how Filemaker Pro can be interfaced with a browser to create an estimating system that can be accessed through the world wide web. With such a system, a user could enter certain job parameters then receive the estimated cost and the number of hours required to complete certain tasks. The authors focus on determining prepress costs since this area is a major cost area for students of printing and graphic design.

This article is not designed to be a step-by step guide on how such an estimating system would be created. Instead, it has been written as a description of the general procedures necessary in order to complete such a project.

Options

A number of options exist for instructors who want to teach estimating using computers. First, proprietary estimating systems are available, but they could run into the thousands of dollars to purchase. If more than one computer is required to access the system, the cost might be even higher. While proprietary systems may be cost prohibitive, and may not exactly match one's needs, they do have the advantage of being the type of estimating system that a student would be likely to use in industry.

Electronic spreadsheets are a great resource for creating an electronic estimating system. Instructors have already employed spreadsheets to create in-house estimating systems. Spreadsheets have an advantage over programming in that they are relatively easy to use and do not require extensive time to create. The large physical size of spreadsheets could be considered a disadvantage since they may be cumbersome with which to work. Each computer must be equipped with the spreadsheet program and the student must know how to use it.

Another approach would be to create a computerized estimating system using a programming language such as Visual Basic. There may even be some students majoring in computer science at your school who would be willing to work on such a project on an independent study.

Yet another choice would be to create an estimating program that could be accessed and used through the use of a web browser. Using the web for this purpose would be ideal since most students are provided access to the Internet, browsers are free, and there would be no additional charge for the classroom use of such a system once it was in place. Alternatively, a programming language could be used to engage a database program that would interface with a browser—anyone using a web page that allows on-line shopping is doing just that. (Electronic shopping is a good example of web pages that provide for information entry and return a result based on the entry.) Although several databases exist that are capable of interfacing a database and a web page, the most practical one for instructors to use is Filemaker Pro. Filemaker Pro is available for both the Macintosh and Windows platforms.

The advantages of Filemaker Pro

Filemaker Pro is a cross-platform environment, while most other popular database programs are specific to either Windows or the Macintosh. Filemaker Pro is relatively easy to learn and it has a built-in web server that makes it simple to place web pages on the Internet. Creating a web estimating system requires more than HTML programming. So, another advantage of Filemaker Pro is that it comes with its own programming language that allows the user to interface a database with a web page. This programming language, called "Claris Dynamic Markup Language" (CDML), is not difficult to learn and Filemaker Pro provides a number of templates to assist in the learning process. Claris' web-authoring tool, Homepage, has tools designed to allow the user to create web pages that use Filemaker Pro databases. Academic pricing is approximately $119 for Filemaker Pro and $49 for Homepage.

Creating a web-based estimating system

There are three major steps in creating an estimating system using Filemaker Pro and a web page. First, you must create the Filemaker Pro file that will be used to store your job information and process it. The second step is to create the web page that will allow the user to submit the information necessary for the estimate to be processed by the database file. The final step is to place the web page on an Internet server. In the following paragraphs, a general explanation of each step will be provided.

Creating the Filemaker Pro file

To ensure success, one must decide the parameters to be used in estimating. For the purposes of this article, an estimating procedure for electronic prepress functions was used as a guide. The guide, a "schedule for cost estimating desktop publishing and electronic prepress production" on page 410 of *Printing Estimating (4th edition)* by Philip Ruggles, provides production times for each prepress function. The creator of the estimating system must decide whether to use these predetermined times or to allow users to input their own. Users must also decide if Ruggles' prepress cost production

Figure 1: Defining fields

areas meet their needs or whether they need to create their own. Once this is decided, the next step is to create the database file.

To create the database file there are five major steps must be completed. First, determine the type of field needed for each calculation or data entry. This is illustrated in Figure 1.

Once field type is decided, the creator must establish the necessary formulas for the calculation fields that require processing by Filemaker Pro. Figure 2 illustrates a field that has formulas necessary to calculate a particular cost or production time.

Once all of the calculations have been entered, the third step is to create the layout for the database file. The layout is what is seen by the individual creating the estimating file, not the web user. Laying the fields out in a logical manner can be helpful when the web pages are being created. Fourth, the file must be made sharable over the Internet. This is simply a matter of making a selection within Filemaker Pro—an issue that will be discussed later. Finally, the web pages must be created.

Creating the estimating web pages

One of the reasons for using Filemaker Pro as the basis for this estimating system is Filemaker Pro's easily-learned CDML language that permits webpages to interact with a database. CDML commands are used to access the database. The basic procedure is to create two web pages: the first is a form which is used to submit the data to Filemaker Pro, and the second is a return form that dynamically creates a page with the answers. See Figure 3 for the submission form and Figure 4 for the return form. To create the web pages, Claris HomePage Version 3 was used. HomePage provides good integration with Filemaker Pro (making the coding less difficult), the program is inexpensive, and the program will run on either PC or Macintosh platforms.

Figures 5 and 6 provide a quick illustration of some of the coding necessary for the files. Figure 5 illustrates the coding necessary to create the web page for the form, and Figure 6 shows shows the codes necessary to create a reply page (a page returned to the user of the estimating program).

In Figure 6, there are familiar

Figure 2: Entering formulas

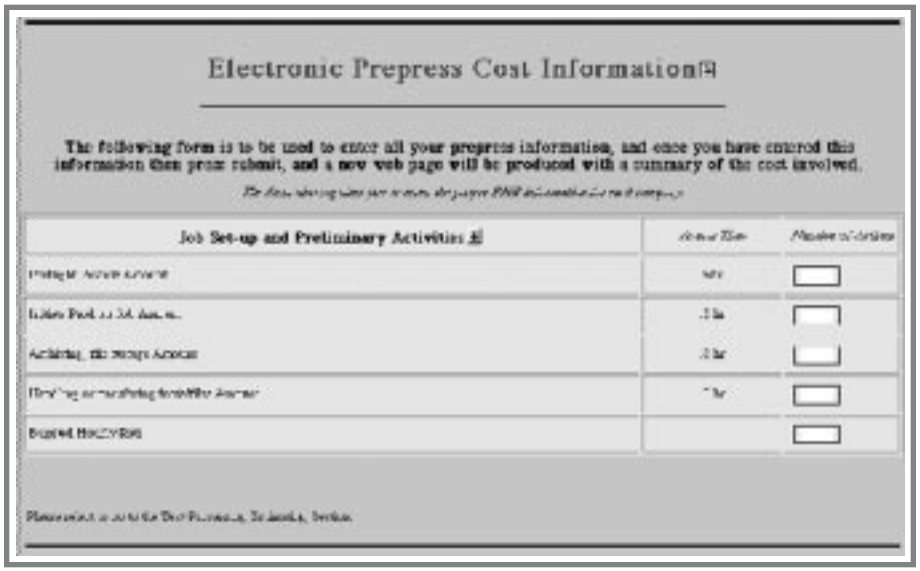

Figure 3: Submission form

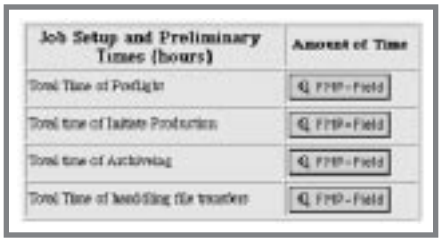

Figure 4: Return form

HTML codes as well as words such as “name=lay,” “value,” and “input type.” These are the CDML commands that are unique to Filemaker Pro and are not applicable to other databases. In Figure 6, there is a field named “FMP-FIELD: phonenumber.” This field, created in Filemaker Pro, will contain information that will be presented on the reply web page.

Once all coding is completed for the web pages, the next step is to place the pages on a web server. Remember that one of the advantages of Filemaker Pro is that it provides a built-in web server that makes it rather easy for the creator of the estimating system to make pages available over the web.

Setting up the web server

There are a number of approaches to setting up a web server so web pages from that server can be accessed over the Internet. There are two basic requirements. First, you must have a static connection to the Internet. A static connection means that there is always an Internet connection while the web server is running. To ensure a static connection, the server must be connected to the Internet by way of a network (normally your school's network), not by way of a modem. There is normally no need to log on unless your organization has its own login procedures for its network. A static connection makes the server available to anyone else on the Internet as long as a web server is running and the Internet address is known.

Setting up a web server on your computer is not a difficult task so long as there is a static connection. There are a number of web servers available—some are free. A web server is part of Macintosh System 8.X. Another web server, MS Personal Web Server (a free download from Microsoft), is available for both the Macintosh and Windows platforms. The installation procedure for each of these servers is covered in the server documentation and requires only a few minutes. Once the server has been set up and configured, web page

```
<HTML>
<!--This file created 3/25/99 1:10 PM by Claris Home Page version 3.0--
<HEAD>
   <TITLE>Customer input information</TITLE>
   <META NAME=GENERATOR CONTENT="Claris Home Page 3.0">
   <X-CLARIS-WINDOW TOP=66 BOTTOM=480 LEFT=8 RIGHT=538>
   <X-CLARIS-TAGVIEW MODE=minimal>
</HEAD>
<BODY BGCOLOR="#CCCC99">
<CENTER> </CENTER>

<P><FORM ACTION="FMPro" METHOD="POST">
   <P><INPUT TYPE="hidden" NAME="-DB" VALUE="prepresscost1.fp3"> <INPU
TYPE="hidden" NAME="-Lay" VALUE="layout #1"> <INPUT TYPE="hidden"
NAME="-Format" VALUE="elecprereply1.htm"></P>

   <CENTER><FONT SIZE="+3" COLOR="#000099"><B>Customer Estimating
   Information Form<A NAME=begin></A></B></FONT>

   <P><FONT SIZE="+1" COLOR="#000099"><B>Please enter the information
   requested below</B></FONT></P></CENTER>
```

Figure 5: Codes to create a form

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</FONT></CENTER>

<P><FONT SIZE="+1">Customer Name</FONT><FONT SIZE="+2">
</FONT><FONT COLOR="#0000CC">[FMP-FIELD: custname]</FONT></P>

<P><FONT SIZE="+1">Address</FONT><FONT COLOR="#0000CC">[FMP-FIELD:
address]</FONT>
<FONT SIZE="+1">City
</FONT><FONT COLOR="#0000CC">[FMP-FIELD: city]</FONT>
<FONT SIZE="+1">State</FONT>
<FONT COLOR="#0000CC">[FMP-FIELD: state]</FONT>
<FONT SIZE="+1">Zip</FONT>
<FONT COLOR="#0000CC">[FMP-FIELD: zip]</FONT></P>

<P><FONT SIZE="+1">Area
code</FONT><FONT COLOR="#0000CC">[FMP-FIELD: areacode]</FONT>
<FONT SIZE="+1">Phone
Number</FONT><FONT COLOR="#0000CC">[FMP-FIELD: phonenumber]</FONT></P>

<P><FONT SIZE="+1">Contact Person
</FONT><FONT COLOR="#0000CC">[FMP-FIELD: contact]</FONT></P>

<P><FONT SIZE="+1">Job Description
</FONT><FONT COLOR="#0000CC">[FMP-FIELD: descrip]</FONT></P>
```

Figure 6: Codes to create a reply page

Figure 7: File sharing

Figure 8: Configuration

delivery can begin.

Each computer on the Internet has a unique address called the IP address. In order for web users to access web pages, the server's address must be known. To determine your server's IP address, review the server's network software or ask your computer department. This address is normally a twelve-digit number, such as 204.171.105.152.

The project illustrated in this article utilized a free Filemaker Pro web server. The Filemaker Pro server is uniquely designed to serve web pages from a database. Setting up this server involves file sharing and configuration activities. File sharing is illustrated in Figure 7 and Figure 8 illustrates configuration. Network sharing must be set to "multi-user" and companion sharing must be turned on. The configuration of remote administration, security, and ports is shown in Figure 8. Pay close attention to the port. When there is already a web server running on a computer, such as in the situation shown in Figure 8, an alternate one must be designated for Filemaker Pro. The use of an alternate web server allows the user to access web pages through the proper server, which, in this case, is the Filemaker Pro server.

To access web pages using the Filemaker Pro server, the user would type an address such as http://204.171.105.152:591/estimating1/input1b.htm.

With regard to the address, three items need to be explained. First, you may ask why a number (the server's IP address) is entered after the "http" rather than a sequence of words. Translating an IP address to a domain name requires your school's network administrator to assign your server a name in its main Internet computer's host file. In the case described in this article, the school had not developed a system for translating IP addresses to domain names. If the school had resolved this issue, then the address might look something like a more familiar address: http://www.estimating.laroche.edu/estimating1/input1b.htm.

The second part of the address that may appear unusual is the ":591." This numeral represents the port in the server from which the Filemaker Pro web server functions. It directs the user's inquiry to the proper web server, and then to the proper web page.

"Estimating" is the folder or directory where your web pages are stored. For a user to access the web page to create an estimate, the user would type an address such as the following in the browser: http://204.171.105.152:591/estimating1/input1b.htm, and then proceed as they would with any other web page that has a form.

Future considerations

Once a database that allows students to access an estimating program is completed, there are still a number of other features that could be added. Some features might include: allowing the user to search the database for a particular estimate that was previously completed; find jobs which have been estimated for a particular customer; obtain a list of jobs; or compile a list of customers. All these procedures are possible because Filemaker Pro's CDML language allows searches to be made of existing databases. Search results can then be displayed on a web page. Each time an estimate is calculated, a new record is created. Thus, previous jobs can be reviewed and printed from a browser.

Summary

Graphic Communications instructors may not include estimation as an integrated part of a course because they leave no convenient way to complete estimates. By placing the estimating program on the Web, the instructor and students are able to submit jobs specifications rather easily on a web page and receive feedback instantly.

The cost of creating such web pages is inexpensive, in terms of time and money, when compared to other available means. A group of instructors, working together by way of the Internet, could rather quickly establish web-based estimating systems that could be available to any graphic communication students connected to the Internet.

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About the author

Mark Snyder Ed.D. is an Assistant Professor in the Department of Graphic Communications at Clemson University.

Tom Bates is an Associate Professor of Graphics, Design, and Communication at LaRoche College.