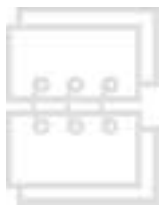


FileMaker®



Portable Quotation System

by
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OVERVIEW

Designed as a tool for a sales staff to create quotes while visiting customers, the Portable Quotation System (PQS) leverages the power of FileMaker software with the portability of wireless Palm products. The PQS was created to enhance the presence of the sales person while on customer visits. By design, the tool should not only create and deliver the quotes, but also record them for future reference. Under the current system, the team was using a quote tracking database. In an effort to reduce confusion, the existing quote tracking database will remain in the new system.

Several different technologies were defined as necessary for this tool. Portable wireless technology was required to allow the entry of the quote. A database was required to build and record the quote. Finally, fax and e-mail capabilities were required for delivery of a finished quote.

Considering the complexities of the combined components, the Palm OS was chosen as the optimal tool to communicate with FileMaker software. Form factor and integrated wireless capabilities combined with a wireless modem made the Palm VII (or Palm V) the preferred choice. Using the wireless functionality rather than a HotSync connection allowed the quote to be sent to the customer while the sales person was present. **FileMaker Pro 5**, **FileMaker Server 5**, and **FileMaker Pro 5 Unlimited** were integrated to allow the combination of inside sales representatives to enter and access quotes directly, and outside sales representatives entering quotes wirelessly via the internet, while using automated scripts to fax and e-mail quotes as needed.

The PQS fulfills the requirements stated above. The outside sales representatives can search existing quotes to find customer information, reducing the amount of data entry needed on the Palm. In addition, the sales representatives have the option of entering quotes for new customers. Quotes are then built with any number of line items. Pricing for each item is automatically calculated based on the quantities entered. The quote can be previewed via e-mail or fax. At its completion, the quote is finalized on the Palm, meaning it can no longer be edited. A machine dedicated to running FileMaker Pro recognizes the new quote as being ready to be processed. By request, the final quote is then faxed and/or e-mailed and recorded in the final quote database as a reference.

TECHNICAL

Because the PQS has multiple functions and not all data should be accessible at all times, the architecture has several components. The Sales database contains all the quotes and their line items. All quotes used by the sales staff are recorded here, so there is a history of customers and quotes. The Palm portion of this solution was added in a relational construct with the Quotes, Line Items, and Products databases. The Quotes and Sales tables are related and pull customer information from an existing quote into a new quote, as well as move the quote from the Quotes table to the Sales table when the Palm quote is finalized.

In addition to the multiple data components, this system requires multiple machines to manipulate the data. A dedicated machine running FileMaker Server 5 is used to host all of the database files. These files are accessed by FileMaker Pro Unlimited 5 to serve the data via the internet for the Palm handheld. Additionally, FileMaker Pro clients are used to access the data in a rich-client interface. A separate machine running FileMaker Pro, as well as adjunct software used to create a PDF version of the quote, e-mails the PDF file to the customer, and faxes quotes as necessary. This same machine runs a script in FileMaker that constantly monitors the records being created in the Palm Quotes database. When it finds a finalized quote, it performs the e-mailing or faxing as required and moves that quote to the Sales database.

The fax/e-mail computer, running Windows NT Workstation 4.0, logs into the Palm Quotes database hosted by FileMaker Pro Server 5. A looping script runs on this computer every 30 seconds searching the Quotes file for any record that has been flagged as finalized. When finalized quotes are found, the script goes through each record to see if it should be e-mailed, faxed, or both.

Quotes are e-mailed in formatted high-resolution PDF files, requiring the installation of Adobe Acrobat – specifically the PDF Writer. The PDF Writer has been setup as the default printer, which is important to allow the quotes to be printed through different printer drivers (this will become clear when the Fax solution is explained later on). As a checking system to know if the e-mail was sent correctly, quotes are e-mailed directly out of FileMaker Pro using the SMTPit plug in from Comm-Unity software (www.filemakercomm-unity.net). This cross-platform plug-in allows FileMaker to send e-mail directly, without the use of a separate e-mail application. It also allows file attachments and several other features that make it a great addition to FileMaker Pro software.

When our looping script encounters a quote needing to be e-mailed, the record is printed to PDF from a quote form layout. The script then sends commands to the SMTPit plug-in to set the e-mail recipient, subject, and message, attach the PDF file, then send the e-mail. Any errors in sending the e-mail are logged in the quote record.

The same quote form layout is used when a quote is faxed to a customer. To fax directly from FileMaker Pro, we used Symantec's WinFax Pro 10.0 (www.symantec.com/winfax), and FaxTool from Data Designs (www.datadesigns.com). The automated printing of a fax from FileMaker Pro requires a printer switch from our default (PDF Writer) to the WinFax print driver; then back to PDF Writer again so we can continue printing PDFs for e-mails. FaxTool not only handles the printer switch to WinFax then back to PDF Writer; it also takes care of sending the fax number and recipient info from FileMaker Pro to WinFax prior to printing, virtually automating the process.

WIRELESS PALM PUBLISHING

Creating wireless Palm content is somewhat more specialized than internet programming. Web pages are generated and sized for the screen of the Palm. Graphics are reduced in size and colors to fit the 2-bit or 4 shade (white, black, and two intermediate shades) grayscale screen. The pages are then compiled to place static pages and graphics in an executable file on the Palm called a Palm Query Application (PQA). This reduces the amount of data sent over the wireless network. FileMaker's CDML language is well suited to this environment since FileMaker reformats the web pages into HTML code easily interpreted by the Palm.

Several useful web sites exist for information on creating a site for wireless Palm consumption. The creation of the PQS system was helped tremendously by the information found in these pages in particular:

<http://www.palmos.com/dev/tech/webclipping>
(Palm web clipping reference)

http://www.palmos.com/dev/tech/webclipping/tutorials/tutorial_web.html
(Palm web clipping tutorial for web developers)

http://www.rcconsulting.com/PQA_DEMO/quickstart_guide.html
(Using FileMaker with Palm wireless from Richard Carlton Consulting)

<http://oasis.palm.com/dev/kb/>
(Knowledge base for Palm development)

<http://oasis.palm.com/dev/kb/manuals/1539.cfm>
(HTML codes recognized by web clipping)

<http://oasis.palm.com/dev/kb/article.cfm?id=1460>
(Palm proxy server information - useful for setting up firewalls to only accept Palm connections)

<http://spp.palm.com/>
(Palm Solution Provider Program - a must for creating PQAs. Join the program and get the Palm OS Emulator (POSE) to test PQAs on a Mac or Windows PC)

Documenting every piece of HTML/CDML code that PQS uses would be daunting, but a few key pieces of HTML are necessary for successful web clipping code. The first indicates to the Palm proxy server that the page is formatted for the Palm. Without this tag, the proxy server will truncate the page at 1024 bytes, so use this tag on all pages to be clipped:

```
<meta name="PalmComputingPlatform" content="true">
```

The next tag is used in the first page of the clipping application. It is used during the creation of the PQA to compile a graphic into the file so it is stored locally on the Palm rather than sent wirelessly. Use this any time there is a graphic in the web site:

```
<meta name="LocalIcon" content="sun.gif">
```

Of course, *sun.gif* will be replaced with the desired graphic's name. To reference the stored graphic, use the following tag (substituting PQSystem with the name given to the PQA file and sun.gif with the desired filename):

```

```

Due to the screen on the Palm, these graphics are limited in size and colors. The screen is 153 pixels wide and 144 pixels high. Graphics may be taller than 144 pixels, though it is not recommended. These graphics are also limited to 2 bits per pixel, making available colors black, white, light gray, and dark gray (#000000, #FFFFFF, #C0C0C0, and #808080 respectively). The Palm is able to use GIF or JPEG formatted graphics.

Two other tags unique to web clipping applications are used to identify the Palm user - %ZIPCODE and %DEVICEID. When the Palm proxy server encounters the %ZIPCODE string, it replaces

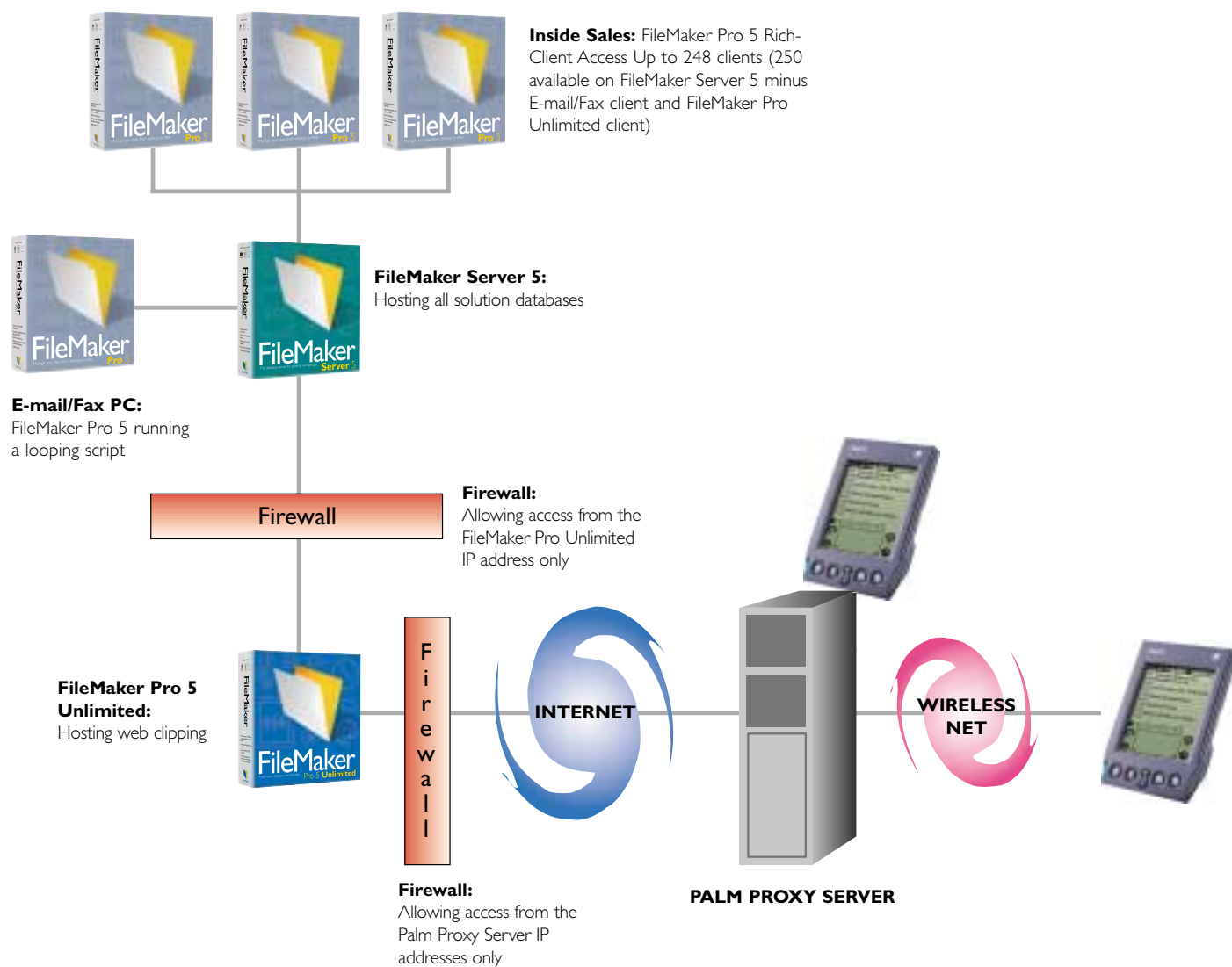
it with the 5-digit zip code of the base station the Palm is communicating with. The %DEVICEID is replaced with the Palm ID. It is an undocumented group of numbers separated by decimal points. The first digit indicates whether the device is a Palm device (1), not a Palm device (-1), or an undetermined device (0).

Other code used for the web-clipping in the PQS was the FileMaker proprietary CDML code. Claris HomePage was used to write the HTML/CDML code.

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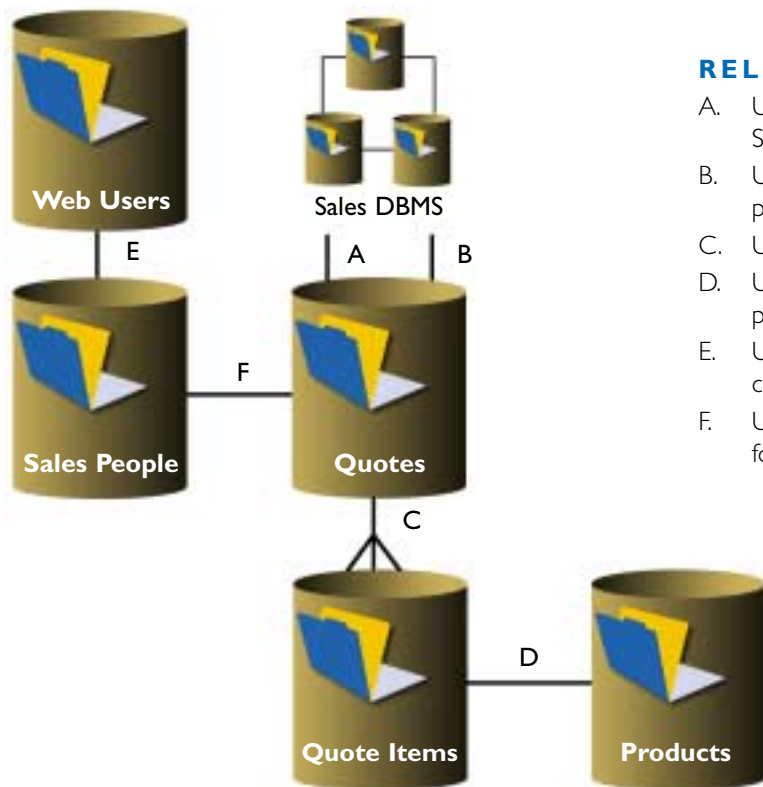
Portable Quotation System

Product Diagram



Portable Quotation System

ER Diagram



RELATIONSHIP DESCRIPTION

- A. Used to lookup customer information from existing Sales records for new quotes.
- B. Used to move a new quote (and quote items from a portal) to the Sales database.
- C. Used for the quote line items.
- D. Used to lookup product information, including quantity prices or the line items.
- E. Used to lookup related inside sales representatives for the current user.
- F. Used to enter inside sales representative contact information for the quote.

TABLE DESCRIPTION

Sales DBMS: The pre-existing database system used to make and track quotes internally. Its internal structure is not important to the description of the Portable Quotation System.

Quotes: The table used to build a quote on the Palm. When the quote is finalized, it is moved from this table to the Sales table with related quote items populating the repeating fields.

Products: Information is looked up from this table to build the quote items. This allows the Palm users to enter a small amount of data to get a great deal of information. It also has the added capabilities of allowing a calculation based on the total quantity of licenses to recalculate the individual prices.

Web Users: This table contains login information for the Palm users to provide a layer of security to the Palm portion of the database.

Sales People: This table contains information about the sales people in the company. It has several self-relationships to determine the inter-relationships of the sales force, such as which inside sales representative is related to the outside representative.

Portable Quotation System

Palm Flow Diagram

