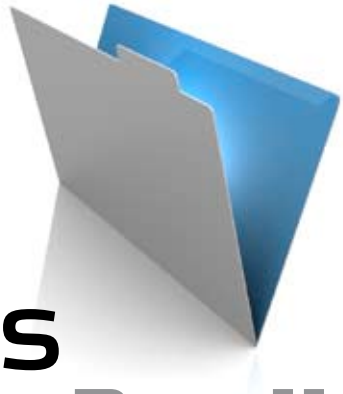

FileMaker for PHP Developers Part II

FileMaker is a popular and powerful desktop database application toolkit. FileMaker, Inc. recently released a beta version of the FileMaker API for PHP, which allows PHP to more easily talk to the FileMaker Server Advanced product. Last month, author Jonathan Stark introduced some of the concepts behind the newly hatched API. In the concluding episode of this two-part series, he explains how FileMaker makes editing your database records a snap.

by Jonathan Stark

PHP: *4.3.x or better*

O/S: *Any supported by PHP*

Other Software: *FileMaker Pro and FileMaker Server Advanced*

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FileMaker is a workgroup productivity toolkit that was designed to allow knowledge workers to quickly and easily construct data management systems for themselves.

In the first part of the *FileMaker for PHP Developers* series, I introduced you to the basics of FileMaker development in the desktop environment, and explained how to leverage that development work to easily display your data on the Web using the FileMaker API for PHP. I covered the terminology used by the FileMaker API, introduced the `list view` and `form view` layouts, and explained how having the business logic embedded in the layout can be a surprisingly efficient approach in real-world applications. We then went on to look at views in more detail, and ended with a brief exploration of where (and why) FileMaker might be deployed to the greatest effect.

With much of the FileMaker desktop development basics behind us, we can focus more on the PHP side of things. This time around, you will learn two different techniques for updating your database records.

Updating a Single Record

Loyal php|architect readers will recall the *view_products.php* script, which was the first of the code listings from Part One of this series. If you recall, we used this script to display a searchable and sortable list of products from the `ProductCatalog` database, which is included with the FileMaker API for PHP download bundle in the form of *ProductCatalog.fp7*.To make the edit functions accessible from the demo scripts available to you, I have simply changed the `view` link beside each product listed on that page to an `edit` link by altering the line:

```
$page_content .= '<td><a
href="view_product.php?recid='.$record_object-
>getRecordId().'">view</a></td>';
```

to read:

```
$page_content .= '<td><a
href="edit_product.php?recid='.$record_object-
>getRecordId().'">edit</a></td>';
```

This new link will navigate to a form view of the clicked `product`. However, before we can look at the PHP code used to update the selected `product` record, we really need to take a peek at the corresponding layout in FileMaker Pro.

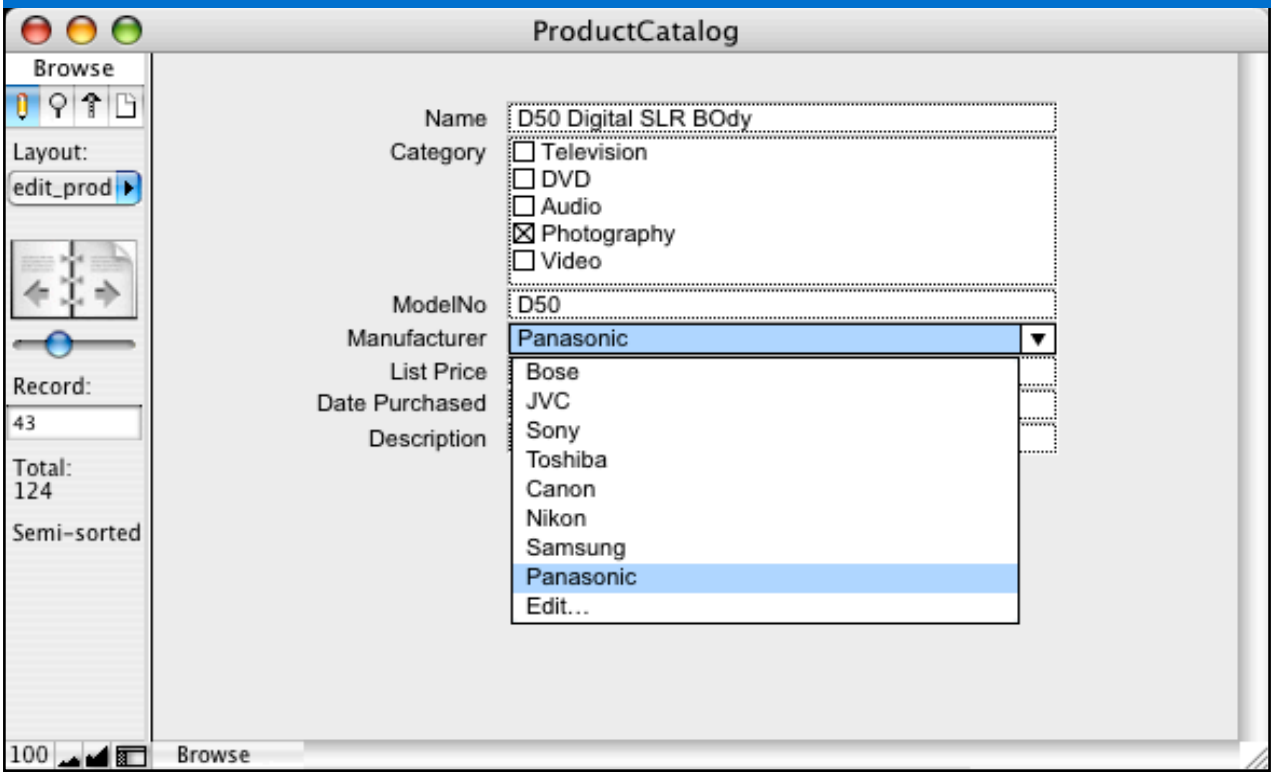
Figure 1 shows the FileMaker layout in `Browse` mode, which is also known as `data entry` mode. Notice that there are radio buttons applied to the `Category` field here, and there is also a drop-down list attached to the `Manufacturer` field. It's obvious that editing these value lists will be a trivial task, even for novice FileMaker Pro users. The end user need only click the `Edit...` link at the bottom of the list to be presented with the `Edit Value List` dialog shown in Figure 2. You will see in a moment that this is very cool, because this simple action on the part of the user will trickle through to the Web without any changes being made to the PHP code.

The code that makes up edit_product.php is reproduced in full in Listing 1. For the sake of clarity, I have left out large chunks of form validation and the sanitization of user input. These are important concerns and relevant here, but a discussion of general form submission handling is outside the scope of this article. It is also notable that I left out much of the FileMaker error checking because it is very repetitive and does not serve to illustrate my point.

You will notice that the script is divided into four distinct sections. The first of these, *initialization*, opens with the definitions used for database connection. For reasons of security, any database credentials should be stored in a separate configuration file above the document root and included from there. Other items in the script initialization section include the `require_once()` call representing the FileMaker dependency, global variable initialization, and some code to check the status of the `$_POST` array to determine whether the form has yet to be processed. If the `process_form` element has been set, the result of the form processing will be displayed in the browser above the empty form; otherwise, the empty form alone will be displayed.

The second section is all about *form display*. It contains the function `show_form()`, which takes all its cues from the specified FileMaker layout. The fields that have value lists applied in FileMaker will be formatted appropriately in HTML, depending on the style type associated with the underlying `field` object. Note that everything here is completely dynamic, so that changes made to the

FIGURE 1

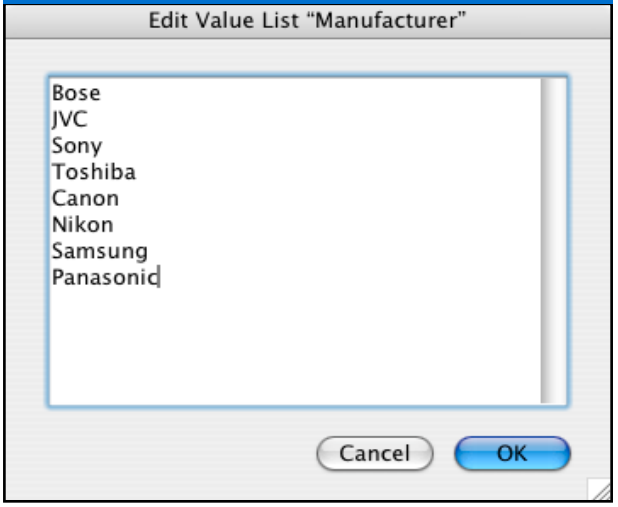


FileMaker layout or to the values lists on that layout will be reflected in the HTML page without any modification of the PHP code.

Thirdly, there is the *form processing*, which takes place, unsurprisingly, within the `process_form()` function. As with the `show_form()` function, `process_form()` bases all its logic on the FileMaker layout named at the beginning of the function; in this case, the chosen layout is `edit_product`. When the time comes for the record to be updated, PHP queries the layout object for the fields it contains, using `$layout->getFields()`. It then loops through the array of fields and matches the field names with those in the `$_REQUEST` superglobal array. On finding a match, it pulls the corresponding data out of the `$_REQUEST` array and updates the field value. Finally, it submits the change to the database. It is important you should be aware that there is a *lot* of validation missing from this area in particular, as mentioned earlier; a database should **never** be updated with raw user input in any real-life application.

With that out of the way, the final section of the script is dedicated to *HTML rendering*. Since this is a demo script, I chose to have the CSS style definitions inline rather than force an unnecessary listing upon you. Apart from that and the title, all we have here is a back link to *view_products.php* and the HTML content generated by show_form() and process_form(), if applicable.

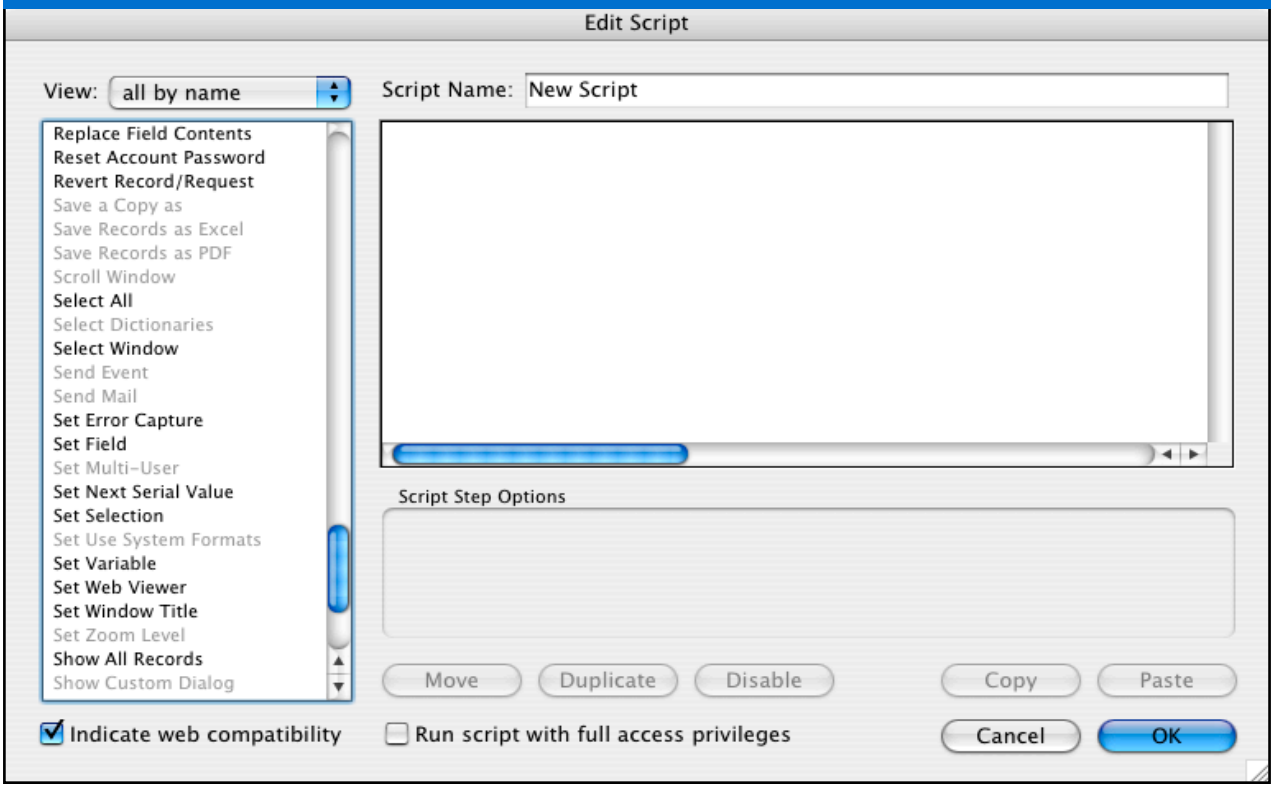
FIGURE 2



Updating a Group of Records

Technically, it would be possible to update a group of records by simply expanding on the "single record update" technique, feeding the script an array of record IDs in a `do.. while` loop. However, this would be less than optimal from the performance perspective, since a) it would require a call to the server for every single record and b) the data is transmitted as XML. A better option would

FIGURE 3



be to use PHP to call a FileMaker script that will do all the dirty work for you; and that's precisely why there are FileMaker scripts.

FileMaker Scripts

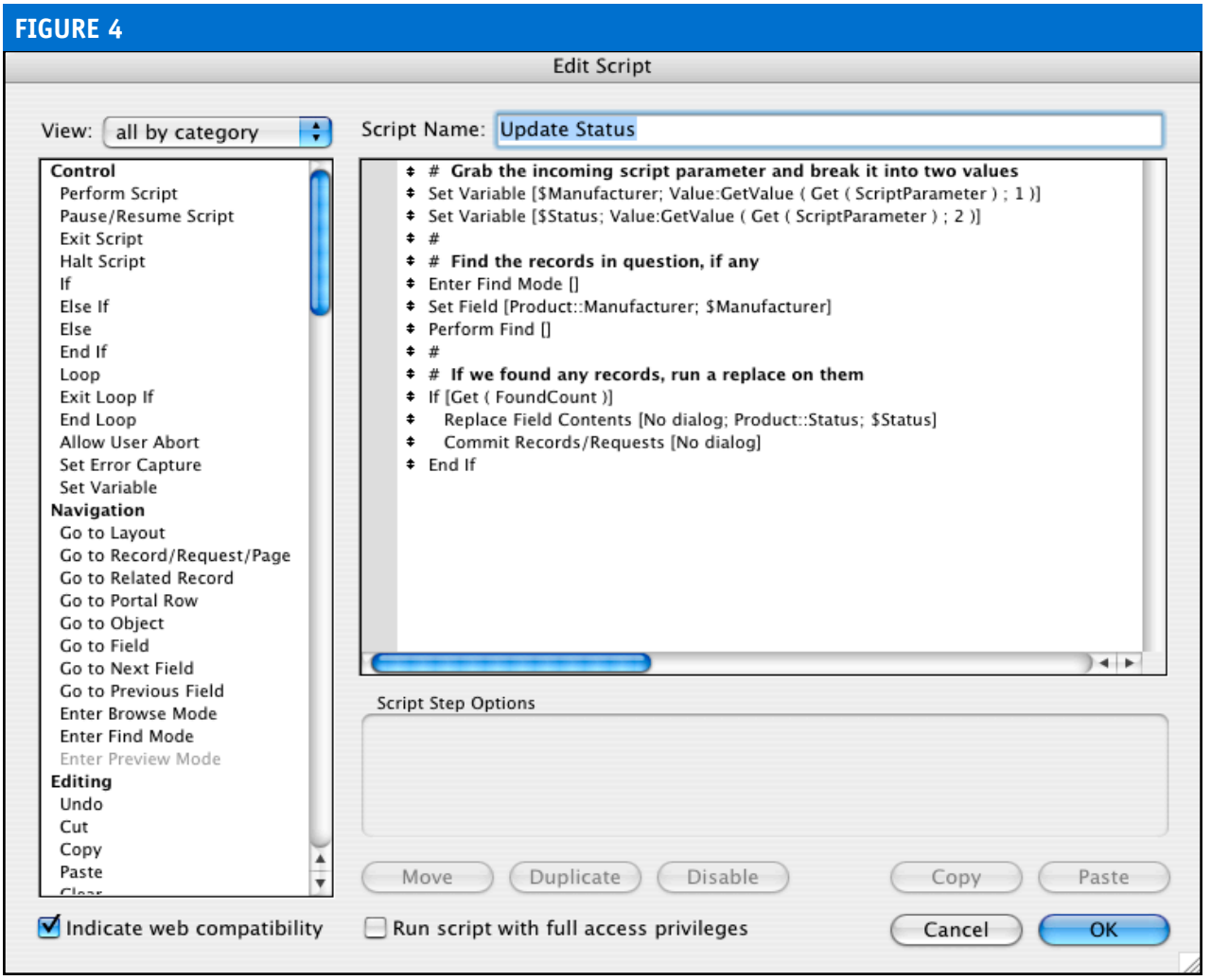
FileMaker Pro has a point-and-click scripting environment called *ScriptMaker*. This ScriptMaker allows you to create macros that can execute all sorts of useful commands with a great deal of ease. Normally, scripts are run by FileMaker Pro users, but they can be triggered by PHP as well. The coolest part is that you can send parameters to a FileMaker script via PHP, thereby customizing the behavior of that script on the fly. In this example, I am going to create a PHP page that will allow the user to select a `Manufacturer`, enter a `Status` and submit the form. The form will send the `Manufacturer Name` and `Status` to the `Update Status` script in FileMaker, passing all the data elements as arguments. The FileMaker script will then locate any `Product` records with a matching `Manufacturer`, and update the `Status` value accordingly.

Figure 3 is an illustration of the ScriptMaker environment in FileMaker Pro. Hopefully you can see from the image that it's quite simple to use. The area on the left contains a list of the available commands, and you can double click on any of these to move them into the text area on the right, which displays the script itself. Not all the commands that are made available in ScriptMaker are compatible with PHP, so I have activated the `Indicate web compatibility` checkbox; those of the command options that can't be used are grayed out as a result.

Figure 4 is the Update Status script itself. As you can see, it is very short, and in fact it only took about three minutes to write. It would have taken me much longer to write it in PHP and, as I mentioned earlier, the performance obtained in this way would have been less than wonderful.

Let's break down that Update Status script and see what it's made of.

FIGURE 4



Update Status

The first section in the Update Status script accepts the incoming script parameter, breaks it into two values, and stores the values in separate variables:

```
Set Variable [
  $Manufacturer;
  Value:GetValue(Get(ScriptParameter); 1)
]

Set Variable [
  $Status;
  Value:GetValue(Get(ScriptParameter); 2)
]
```

Technically speaking, a FileMaker script can only accept one parameter, and you should access that parameter value with the `Get(ScriptParameter)` function. You can get around the single parameter limitation, as shown here, by delimiting your values with returns and using the `GetValue()` function. `GetValue()` accepts an EOL-delimited list of values and a value number as parameters, and will return the value indicated by the number. If you think of the EOL-delimited list as an array, then `GetValue($Values; 2)` is equivalent to `$Values['2']` in PHP.

Now that we have the number of arguments we need to pass, the next thing is to find the `Product` records that are associated with the selected `Manufacturer` name. We do this by entering `Find` mode, inserting the selected `Manufacturer` name into the `Manufacturer` field, and performing the `Find` request. While we're there, notice that the `Product::` prefix in the `Set Field` step indicates that the `Manufacturer` field belongs to the `Product` table.

```
Enter Find Mode
Set Field [
  Product::Manufacturer;
  $Manufacturer
]
Perform Find
```

At this point, we need to check to see whether our request matched any records. To do so, we open an `If` block and make our enquiry using the function `Get(FoundCount)`, which will return an integer. If the integer it returns happens to be `0`, the `If` condition will evaluate to `FALSE` and the rest of the script will be skipped. If, however, the number of items is greater than `0`, the `If` condition will evaluate to `TRUE`. This will trigger the execution of the `Replace` and `Commit Records/Requests` commands.

```
If [ Get(FoundCount) ]
  Replace Field Contents [
    Product::Status;
    Replace with calculation: $Status
  ]
  Commit Records/Requests
End If
```

The call to `Replace` does just as you might expect—namely, it replaces the value in the `Status` field of the found `Product` records with the value in the `$Status` variable. Remember this: the `$Status` variable was populated by the script parameter that was sent from PHP.

When the `Replace` routine has completed, the `Commit` command is executed; this routine is responsible for writing the changes to the database.

update_status.php

With the FileMaker script in place, we can turn our attention to the PHP page that will call it: *update_status.php*, rendered here as Listing 2. As with the earlier code listing, I have left out much in the way of form validation and the sanitization of user input, so please tread with care when it comes to implementing this functionality yourself. There are five distinct sections in *update_status.php*, some of which match the sections in *edit_product.php* (Listing 1) and some of which are unique to this script. Thus, as before, we have the *initialization* stage making the decision about the nature of the HTML page content, depending on the stage of processing the script has reached. We meet, once again, the *form display* section containing the `show_form()` function, where the options for the `select` block in the `Manufacturer` field are pulled from the layout in FileMaker. Next up, there's something you haven't seen until now; *form validation*. In this instance, this is restricted to checking that the `Manufacturer` and `Status` fields contain some input, and ensuring that $_POST['manufacturer'] doesn't contain an illegal hyphen or $_POST['status'] any HTML tags. Again, this offers very little protection, and you will need tighter control over your user input data in any real-life application.

Next up is our old friend *form processing*, which is the home of the process_form() function. In this particular case, process_form() is the focus of the example, as it shows you how to go about sending a form submission to a FileMaker script. As an added bonus, you can see the syntax for sending multiple parameters in the line:

```
$script_param = $_POST['manufacturer']."\n".$_
POST['status'];
```

Remember, though, that "`\n`" is not valid syntax on every platform. Those of you who are running PHP 5.0.2 or newer will be able to use the built-in constant `PHP_EOL` here, but if you're stuck with an older version of PHP you will need to create your own EOL constant to achieve portability.

Finally, there is the HTML template, which once again contains inline CSS style definitions, a title, and the absolute basic necessities to frame and decorate this dynamically rendered page.

LISTING 1

```php
<?php
/* edit_product.php */

########################
#     INITIALIZATION   #
########################

# For security reasons, these lines should either be included from a
# config file above the document root, or possibly captured during a
# login and stored in the SESSION superglobal array

define('FM_HOST', '127.0.0.1');
define('FM_FILE', 'ProductCatalog.fp7');
define('FM_USER', 'esmith');
define('FM_PASS', 'f!r3crack3r');

# this is the include for the API for PHP
require_once ('FileMaker.php');

# initialize page content var
$page_content = '';

# if this page has been submitted to itself, then process it
if (array_key_exists('process_form', $_POST)) {
    $page_content .= process_form();
}

# show the form
$page_content .= show_form();

########################
#      FORM DISPLAY    #
########################

function show_form() {
    # grab the record id sent in the url from list page or a post from
this page
    $recid = (array_key_exists('recid', $_REQUEST)) ?
htmlspecialchars($_REQUEST['recid']) : '';

    # set the layout name for this page
    $layout_name = 'edit_product';

    # initialize our output var
    $html = '';

    # instantiate a new FileMaker object
    $fm = new FileMaker(FM_FILE, FM_HOST, FM_USER, FM_PASS);

    # get the record by it's id
    $record = $fm->getRecordById($layout_name, $recid);

    # get the layout as an object
    $layout_object = $fm->getLayout($layout_name);

    # get the fields from the layout as an array of objects
    $field_objects = $layout_object->getFields();

    # start compiling our form inputs
    $html .= '<form action="'.$_SERVER['PHP_SELF'].'" method="post">';
    $html .= "<input type=\"hidden\" name=\"process_form\" value=\
"true\" />\n";
    $html .= "<input type=\"hidden\" name=\"recid\" value=\"{$recid}\"
/>\n";
    $html .= "<table>\n";
    foreach($field_objects as $field_object) {
        # grab the actual field name
        $field_name = $field_object->getName();

        # replace any spaces with underscores so field names match keys
in $_REQUEST array
        $field_name_underscore = str_replace(' ', '_', $field_name);

        # grab the field value from either the $_REQUEST array, or from
FileMaker
        if (array_key_exists($field_name_underscore, $_REQUEST)) {
            if (is_array($_REQUEST[$field_name_underscore])) {
                # convert checkbox input to return delimited values
                $field_value = implode("\n", $_REQUEST[$field_name_
underscore]);
            } else {
                # grab whatever was sent
                $field_value = $_REQUEST[$field_name_underscore];
            }
        } else {
            # this must be the first time through the form because $_
REQUEST array does not exist for this field
            $field_value = $record->getField($field_name);
        }

        # get the style type, which will tell us if there is a value
list attached to the field, and if so, what style
        $field_style_type = $field_object->getStyleType();

        # output the form control appropriate to the field style type
        switch ($field_style_type) {
            case 'POPUPLIST':

                # start compiling html for this select control
                $html .= "<tr>\n";
                $html .= "<th>{$field_name}</th>\n";
                $html .= "<td>\n";
                $html .= "<select name=\"{$field_name_underscore}\">\n";

                # loop through the values from the list attached to this
field
                $values = $field_object->getValueList();
                foreach($values as $value) {
                    $selected = ($field_value == $value) ? '
selected="selected"' : '';
                    $html .= "<option{$selected}>{$value}</option>\n";
                }

                # close the open tags
                $html .= "</select>\n";
                $html .= "</td>\n";
                break;

            case 'CHECKBOX':

                # start compiling html for this checkbox set
                $html .= "<tr>\n";
                $html .= "<th>{$field_name}</th>\n";
                $html .= "<td>\n";

                # loop through the values from the list attached to this
field
                $values = $field_object->getValueList();
                foreach($values as $value) {
                    $checked = (strpos($field_value, $value) !== FALSE)
? ' checked="checked"' : '';
                    $html .= "<input type=\"checkbox\" name=\"{$field_
name_underscore}[]\" value=\"{$value}\"{$checked} />{$value}<br />\n";
                }

                # close the open tags
                $html .= "</select>\n";
                $html .= "</td>\n";
                break;

            case 'RADIOBUTTONS':

                # start compiling html for this checkbox set
                $html .= "<tr>\n";
                $html .= "<th>{$field_name}</th>\n";
                $html .= "<td>\n";

                # loop through the values from the list attached to this
field
                $values = $field_object->getValueList();
                foreach($values as $value) {
                    $checked = (strpos($field_value, $value) !== FALSE)
? ' checked="checked"' : '';
                    $html .= "<input type=\"radio\" name=\"{$field_name_
underscore}\" value=\"{$value}\"{$checked} />{$value}<br />\n";
                }

                # close the open tags
                $html .= "</select>\n";
                $html .= "</td>\n";
                break;

            default:

                # the remaining field style types (EDITTEXT and
CALENDAR) are best represented as text inputs
                $html .= '<tr><th>'.$field_name.'</th><td><input
type="text" name="'.$field_name_underscore.'" value="'.$field_value.'" /></
td></tr>'."\n";
                break;
        }
    }

    # add a submit button and close the open tags
```

LISTING 1: Continued...

LISTING 2

```
<?php
/* update_status.php */

########################
#     INITIALIZATION   #
########################

# For security reasons, these lines should either be included from a
# config file above the document root, or possibly captured during a
# login and stored in the SESSION superglobal array
define('FM_HOST', '127.0.0.1');
define('FM_FILE', 'ProductCatalog.fp7');
define('FM_USER', 'esmith');
define('FM_PASS', 'f!r3crack3r');

# include the FileMaker API for PHP
require_once ('FileMaker.php');

# handler for showing, validating, and processing the form
if (array_key_exists('process_form', $_POST)) {
    if ($errors = validate_form()) {
        $page_content = show_form($errors);
    } else {
        $page_content = process_form();
    }
} else {
    $page_content = show_form();
}

########################
#      FORM DISPLAY    #
########################

function show_form($errors = array()) {

    # initialize variables
    $layout_name = 'update_status';
    $post_manufacturer = (array_key_exists('manufacturer', $_POST)) ?
$_POST['manufacturer'] : '';
    $post_status = (array_key_exists('status', $_POST)) ? $_
POST['status'] : '';

    # instantiate a new FileMaker object
    $fm = new FileMaker(FM_FILE, FM_HOST, FM_USER, FM_PASS);

    # create a new layout object
    $layout_object = $fm->getLayout($layout_name);
    if (FileMaker::isError($layout_object)) {
        return ('<p>'.$layout_object->getMessage().' (error '.$layout_
object->code.')</p>');
    }

    # get the manufacturer value list as an array
    $manufacturers = $layout_object->getValueList('Manufacturer');
    if (FileMaker::isError($manufacturers)) {
        return ('<p>'.$manufacturers->getMessage().' (error
'.$manufacturers->code.')</p>');
    }

    # sort manufacturers
    sort ($manufacturers);

    # create the html manufacturer options
    $manufacturer_options  = "<option>Select a manufacturer...</option>\
n";
    $manufacturer_options .= "<option>-</option>\n";
    foreach($manufacturers as $manufacturer) {
        $selected = ($manufacturer == $post_manufacturer) ? '
selected="selected"' : '';
        $manufacturer_options .= "<option{$selected}>{$manufacturer}</
option>\n";
    }

    # compile errors as html, if any
    $error_list = '';
    if (count($errors)) {
        $error_list .= '<ul class="errors">'."\n";
        foreach ($errors as $error) {
            $error_list .= "<li>{$error}</li>\n";
        }
        $error_list .= "</ul>";
    }

    # insert the errors and manufacturer options into a form
    $html = <<<HTML
{$error_list}
<form action="{$_SERVER['PHP_SELF']}" method="post">
```

LISTING 2: Continued...

```
    <input type="hidden" name="process_form" value="true" />
    <select name="manufacturer">
{$manufacturer_options}
    </select>
    <p><input type="text" name="status" value="{$post_status}" /></p>
    <p><input type="submit" name="submit" value="Continue" /></p>
</form>

HTML;
    return $html;
}

########################
#    FORM VALIDATION   #
########################

function validate_form() {
    $errors = array ();
    if ($_POST['manufacturer'] == 'Select a manufacturer...') {
        $errors[] = 'Select a manufacturer';
    }
    if ($_POST['manufacturer'] == '-') {
        $errors[] = 'Select a manufacturer';
    }
    if ($_POST['status'] == '') {
        $errors[] = 'Status is required';
    }
    if ($_POST['status'] != strip_tags($_POST['status'])) {
        $errors[] = 'HTML tags are not allowed in the Status field';
    }
    return $errors;
}

########################
#    FORM PROCESSING   #
########################

function process_form() {
    # instantiate a new FileMaker object
    $fm = new FileMaker(FM_FILE, FM_HOST, FM_USER, FM_PASS);

    # set a couple variables
    $layout_name = 'update_status';
    $script_name = 'Update Status';
    $script_param = $_POST['manufacturer']."\n".$_POST['status'];

    # call the script with the parameter
    $script_object = $fm->newPerformScriptCommand($layout_name, $script_
name, $script_param);

    # run the script
    $script_result = $script_object->execute();

    # check for errors
    if (FileMaker::isError($script_result)) {
        return ('<p>'.$script_result->getMessage().' (error '.$script_
result->code.')</p>');
    }

    $html = <<<HTML
<p>{$_POST['manufacturer']} records have been updated with {$_
POST['status']} status.</p>
<p><a href="{$_SERVER['PHP_SELF']}">Click here to continue...</a></p>

HTML;
    return $html;
}

########################
#    HTML RENDERING    #
########################
?>
<html>
    <head>
        <meta http-equiv="Content-type" content="text/html; charset=utf-
8">
        <title>update_status</title>
        <style type="text/css" media="screen">
            body {font: 75% "Lucida Grande", "Trebuchet MS", Verdana,
sans-serif; text-align:center;}
            a, a:visited {color: blue;text-decoration: none;font-weight:
bold;}
            a:hover, a:active {color: blue;text-decoration:
underline;font-weight: bold;}
            input, select {width:260px;}
            #container {width:400px;margin:0 auto;padding:20px;}
            .errors {background-color:yellow;border:2px solid
```

Conclusion

I hope that this article has given you a taste for the rapid application development that is possible with FileMaker Pro, FileMaker Server Advanced, and the FileMaker API for PHP. No, FileMaker is never going to be an Oracle killer; but I can't tell you the number of times I have seen a "temporary" FileMaker solution bridge the gap for someone who was waiting for a SQL solution that ultimately never materialized. If you would like to look at the API code, currently at public beta status, you can download the FileMaker API for PHP at no cost from http://www.filemakertrial.com/php/default.aspx simply by filling a short form. If you would like to play around with this code, you will need a copy of FileMaker Pro, and you will also need FileMaker Server Advanced. Neither are available for free, but you can get limited versions of each by joining the FileMaker Solutions Alliance (FSA). There is an annual fee for FSA membership, but the amount of free software offered to members would more than offset the membership fee. Please visit http://www.filemaker.com/developers/joinfsa.html for more information about joining the FSA.

LISTING 2: Continued...

```
#ff9900;padding:10px 0 10px 30px;text-align:left;}
        </style>
    </head>
    <body>
        <div id="container">
            <h2>Update Product Status</h2>

<!-- BEGIN DYNAMIC CONTENT -->

<?php echo $page_content; ?>

<!-- END DYNAMIC CONTENT -->

        </div>
    </body>
</html>
```

JONATHAN STARK is the President of Jonathan Stark Consulting, an IT consulting firm located in Providence, RI. He consults a variety of clients from the creative industry including Staples, Turner Broadcasting, and Ambrosi. He has spoken at the FileMaker Developers Conference, is a Certified FileMaker Developer, and teaches training courses in both FileMaker and Web publishing. Jonathan is reluctant to admit that he began his programming career more than 20 years ago on a Tandy TRS-80. For more information, please visit http://jonathanstark.com.

LISTING 1: Continued...

```
    $html .= '<tr><th> </th><td><input type="submit" name="submit"
value="save changes" /></td></tr>'."\n";
    $html .= "</table>\n";
    $html .= "</form>\n";
    return $html;
}

########################
#    FORM PROCESSING   #
########################

function process_form() {
    # instantiate a new FileMaker object
    $fm = new FileMaker(FM_FILE, FM_HOST, FM_USER, FM_PASS);

    # set a couple variables
    $layout_name = 'edit_product';
    $recid = $_REQUEST['recid'];

    # get the layout as an object
    $layout_object = $fm->getLayout($layout_name);

    # get the fields from the layout as an array of objects
    $field_objects = $layout_object->getFields();

    # loop through fields, pulling values from the $_REQUEST array
    $values = array();
    foreach($field_objects as $field_object) {
        $field_name = $field_object->getName();
        $field_name_underscore = str_replace(' ', '_', $field_name);
        if (is_array($_REQUEST[$field_name_underscore])) {
            $values[$field_name] = implode("\n", $_REQUEST[$field_name_
underscore]);
        } else {
            $values[$field_name] = $_REQUEST[$field_name_underscore];
        }
    }

    # create a new edit command
```

LISTING 1: Continued...

```
    $edit_command = $fm->newEditCommand($layout_name, $recid, $values);

    # execute the edit_command
    $edit_command->execute();

    $html = '<p>Record has been updated!</p>';
    return $html;
}

########################
#    HTML RENDERING    #
########################

?>
<html>
    <head>
        <meta http-equiv="Content-type" content="text/html; charset=utf-
8">
        <title>edit_product</title>
        <style type="text/css" media="screen">
            body {font: 75% "Lucida Grande", "Trebuchet MS", Verdana,
sans-serif;}
            table {width: 600px; border-collapse:collapse; border-color:
#cccccc; margin-bottom: 10px;}
            th {padding: 3px; background-color: #DDD; text-align: left;}
            td {padding: 3px;}
            table, th, td { border:1px solid #cccccc; }
            a, a:visited {color: blue;text-decoration: none;font-weight:
bold;}
            a:hover, a:active {color: blue;text-decoration:
underline;font-weight: bold;}
        </style>
    </head>
    <body>
        <p><a href="view_products.php">view products</a></p>
<?php echo $page_content; ?>
    </body>
</html>
```