

Data Entry in SAS® Strategy Management A New, Better User (and Manager) Experience

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ABSTRACT

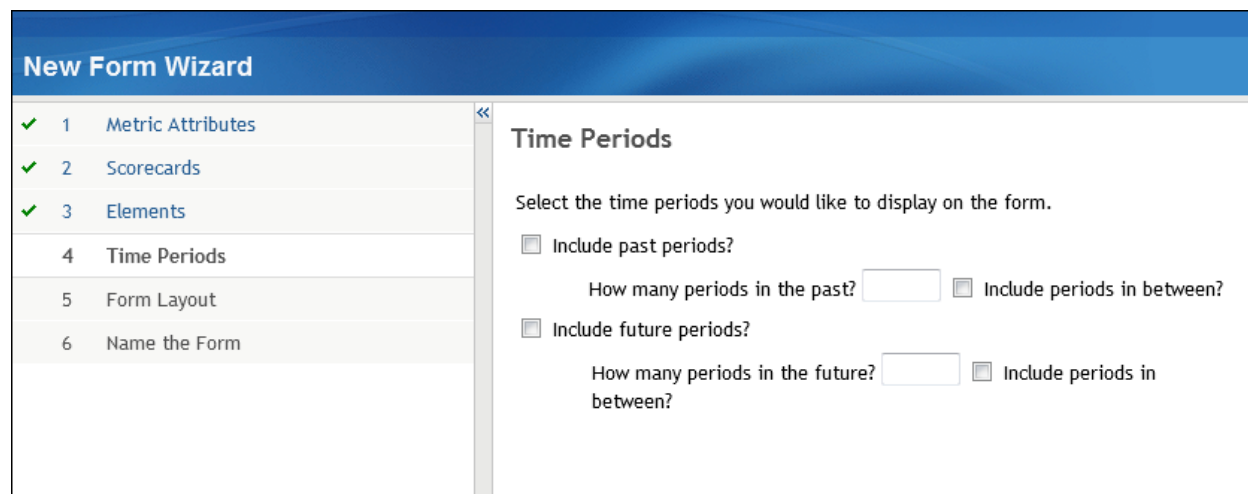
Data entry in SAS Strategy Management has never been an especially pleasant task given the outdated user interface, lack of data validation, and little workflow management. However release 5.4 unveils a complete overhaul of this system. The sleeker HTML5-based appearance provides a more modern Web experience. You are now able to create custom data validation rules and attach a rule to each data value. Discover how form workflow is supported via SAS® Workflow Studio and the SAS Workflow Services.

INTRODUCTION

Using SAS Strategy Management in SAS is an excellent way to keep up with the various goals and directions of the organization but has historically been unpleasant to use when inputting raw data. In SAS Strategy Management version 5.4 the data-entry system has been completely redesigned to facilitate this task. The primary users of the system will discover a much-improved HTML5 user interface, extensive validation to insure data integrity, and integration with SAS Workflow Studio to allow for a user-defined system of approval before committing data to the application. In replacing the previous system this new functionality provides data-entry users greater accuracy, managers with an enhanced approval process, and modelers with a quick and simple way to create data entry forms.

REVIEWING THE PREVIOUS DATA ENTRY SYSTEM

Before examining this new system it is instructive to consider the previous data-entry system included with SAS Strategy Management. It started with a form creation wizard that allowed the modeler to create a form. The modeler indicated which scorecards and elements for which data was to be collected, which metric attributes were to be used, and what period was involved. This wizard was long and not particularly intuitive, especially when specifying period information.



New Form Wizard

- ✓ 1 Metric Attributes
- ✓ 2 Scorecards
- ✓ 3 Elements
- 4 Time Periods
- 5 Form Layout
- 6 Name the Form

Time Periods

Select the time periods you would like to display on the form.

☐ Include past periods?

How many periods in the past? ☐ Include periods in between?

☐ Include future periods?

How many periods in the future? ☐ Include periods in between?

Figure 1. Selecting Periods in the Old Form Wizard

After creating the form the modeler would create a SAS portlet using the form as content and assign it to a number of data-entry users by using SAS® Management Console to give those users access. Then the modeler would have to notify the users that the form was ready to use using email or some other method of communication.

The users would then begin to enter data by logging into the SAS® Information Delivery Portal and adding the form to their portal page. The form offered very little data validation. The validations were mostly as crude as checking for a nonblank entry or a value not interpretable as a number. This was implemented in JavaScript so at least the user did not have to submit the whole page to the system in order to get some validation, however there were other validations that required submission. The page of values could not be saved before submitting them to the system and once again the user had to notify the correct individual that they were finished.

Data Entry - Test

Error
Form "Test" had one or more errors during the save operation.Close

Project: LE_TinyProject

Current period: Jan2013 Period type: Month

Scorecard: Parent1 Element type: Measures

Element Label	Actual Jan2013	Target Jan2013
Sales - link to New Project wizard		
Expenses - link to Temp_ProjMgr		
Training - File link		
Productivity - link to STP		
Other income - link to WRS		

Save Close

Figure 2. Data Submission Error in the Old Form Wizard

If the above seemed bad enough consider the situation presented to managers. Initially the system offered no opportunity for the manager to verify that the data entered was correct according to organizational standards. Instead it was simply written out to the SAS® Strategy Management database and immediately reflected in all scorecards that used the data. Later the option of writing the data out to a temporary location (the WDE application option) was added. This allowed a user with the correct privileges to see a button that submitted all the data changes to the permanent database after that user had reviewed them.

Taken as a whole, the data-entry system was far from a polished and effective technique for data input to any application.

DATA ENTRY METHODS IN SAS STRATEGY MANAGEMENT

The SAS Strategy Management application has come a long way as far as data-entry methods. It began with the Web user interface in the SAS Strategy Management Builder where the user could select a scorecard and element, then select a metric attribute and period to finally enter a numeric or text value. However to do all of this required many mouse clicks to enter a single value. A single SAS Strategy Management project often contains many scorecards each with many elements, and the time it took to enter data into all of them became prohibitive. Over the years the SAS Strategy Management development group has added various other methods of entering data into scorecards.

THE BATCH MAINTENANCE FACILITY

One method was the Batch Maintenance Facility (BMF). As the name implies this is a batch oriented process that was added to SAS Strategy Management version 2.3. A user can invoke a macro inside a SAS client to read data into or out of the SAS Strategy Management application. This macro can be very effective for SAS Strategy Management "power" users such as consultants and data modelers. However, BMF is not web-based, requires users with Modeler privileges, and is inherently technical in nature.

BULK EDIT

The ability to add data in bulk or "Bulk Edit" was added to the Web application. This is web-based and allows the user to add values to a group of scorecards and elements at one time. Furthermore the user interface is reasonably intuitive. However, bulk edit also requires users with Modeler privileges and it forces the user to add the *same* value to every object in the group.

THE IMPORT FEATURE

Starting in SAS Strategy Management version 5.3, the Import feature was added. Implemented as a hybrid approach between a batch process and an interactive Web-based process, this feature leverages BMF to read Excel spreadsheets and SAS datasets for input. Also it allows the user to map columns in the input data to SAS Strategy

Management objects. The Import feature is more user friendly to less technical SAS Strategy Management users and it can be run from either the Builder or scheduled as a batch process. However the Import feature also requires that the user have Modeler privileges. Import also involves some degree of interaction with an administrator in order to set up the data source. Finally someone must learn the required format of the input spreadsheet or SAS data set.

All of the above methods have their place depending on certain kinds of tasks performed by the organization. But they all require advanced user privileges meaning that the person that enters the data has to be a Modeler or Administrator. **Most companies might consider forcing all data entry through what is usually a relatively small number of people a bottleneck.** The more common paradigm is to assign data entry to individuals that do not model the data themselves. Furthermore none of the above methods have any system of data approval inherent in the method. The data is immediately written into the SAS Strategy Management database. Again, it is a more common paradigm to have other individuals check the work before committing it. Finally, all of the above methods require that the user involved take on the responsibility of any notifications to any and all interested parties. Notification to these parties is crucial and requiring the user to perform this should not be necessary.

INTRODUCING THE NEW DATA-ENTRY SYSTEM

In order to deal with the needs of a modern enterprise, SAS Strategy Management has redesigned its data-entry system and is introducing it in SAS Strategy Management 5.4. The basic concepts are still there. It starts with the creation of a data-entry form by a Modeler which is then incorporated into a portlet used by data-entry users. But the entire implementation has been rebuilt from the ground up. Take a tour of the new system and its features.

USER INTERFACE

The new user interface has been created in HTML5 using the Dojo open source JavaScript library. It provides for a more modern and stylish appearance as seen in the screen capture below:

Name	Last Entered	Status	Approver	Owner
Sales, West Region	1/14/13 2:54 PM	Workflow not started	approver1,approver2	SAS Demo User
Monthly Widget Actual-Target	1/14/13 2:55 PM	No workflow		SAS Demo User
Ordered	12/4/12 1:22 PM	Approval complete	approver1,approver2	SAS Demo User

Figure 3. New Data-Entry System User Interface

Supported in **Internet Explorer 8, 9, and above, FireFox 3.6 and above** the new user interface offers a more visually appealing design. Additionally it makes use of Ajax-style server calls. This means that as you interact with the various controls data is fetched from the server without performing a time-consuming page refresh, that irritating holdover from the early Web application days. Data validations are performed almost instantly as you move out of a text field. You do not have to click a **Submit** button and wait for the page to return with updated values.

Element	Actual Jan2013 Numeric	Target Jan2013 Numeric
Sales	-1	

Figure 4. Data Validation

The entire user experience is enhanced making what can be a tedious and involved task much less painful and

certainly less prone to error.

RULES-BASED DATA VALIDATION

Another huge improvement comes in the area of data validation. As described earlier the old data-entry system had very rudimentary validation checks performed. Some were implemented in JavaScript so that the user did not have to submit the entire form to the system for validation, however some of the checks did require submission. When you consider that some forms may have over a hundred or more text fields you can imagine how difficult submitting the form over and over could be.

SAS Strategy Management 5.5 introduces *rules*, a new system of data validation that the user can associate with each metric attribute numeric and text value. The rules feature is implemented in HTML5 and Dojo. When you visit the Manage Rules page, you discover the ability to create a named data validation rule.

Figure 5. Rule Definition

Here the Modeler has the ability to define a data validation rule for the input values of a form. Notice that you can specify that the value is numeric or text along with a numeric range for numbers and a maximum length for text. Another possibility is **Choices**. This provides the Modeler with the ability to restrict the entered value to one of a discrete list of selections. The data-entry user will see a dropdown with the values entered here. Finally the rules feature leverages the considerable power of formulas for data validation. The Modeler can basically create almost any kind of validation, even the ability to compare the entered value with the value contained in some other SAS Strategy Management object. For maximum usability, the Modeler can specify a custom error message to explain why a potential entered value has failed validation because of a formula.

After specifying what the validation is the Modeler gives it a name which can be descriptive of what kind of validation is performed. Every metric attribute value whether numeric or text can have a rule assigned to it. This association is done in the SAS Strategy Management Builder on the Edit Metric Attributes page. More than one metric attribute can use a rule so the Modeler can define a core set of rules to be used by any metric attribute in the project.

When the form is displayed to the data-entry user the rules come into play. Because the user interface is using HTML5 the data validation occurs without submitting the page back to the server. Instead when the user's focus leaves the text field the data is checked. If it fails validation the text field is outlined in red and the appropriate error message is displayed (see Figure 4).

USING COLUMN DEFINITIONS FOR COLUMN SELECTION

Another improvement is how the columns of metric attributes are selected for the form. In the new data-entry system,

WORKFLOW

Integration With SAS Groups and Roles

Workflow Templates

```

graph LR
    Start(( )) --> Begin[Begin Workflow Activity]
    Begin --> Assign{Assign Workflow?}
    Assign -- Yes --> NotifyData[Notify Data Assignees Activity]
    Assign -- No --> EnterData[Enter Data Activity]
    EnterData --> Submission{Submission Complete?}
    Submission -- No --> EnterData
    Submission -- Yes --> EntryCounter[Entry Counter=Number of Assignees]
    EntryCounter --> ResponseRequest{Response Request?}
    ResponseRequest -- Yes --> NotifyData
    ResponseRequest -- No --> DataEntryActivity{Data Entry Activity?}
    DataEntryActivity -- Yes --> ApproveForm[Approve Form Data Activity]
    DataEntryActivity -- No --> RespondCity[Respond City Approval Counter]
    ApproveForm --> AllApproved{All Assignees Approved For Approval?}
    AllApproved -- Yes --> AdjustCounter[Adjust Counter]
    AllApproved -- No --> RespondCity
    AdjustCounter --> EntryApproval{Entry Approval Counter=Number of Assignees}
    EntryApproval -- Yes --> NotifyAssigneesForm[Notify Assignees of Form Approval]
    EntryApproval -- No --> DataEntryActivity
    RespondCity --> EmptyQueue{Empty Approval Queue?}
    EmptyQueue -- Yes --> NotifyAssigneesForm
    EmptyQueue -- No --> NotifyAssigneesForm
    NotifyAssigneesForm --> End((End))
  
```

Figure 6. Workflow Template for Ordered Approval

Attaching Workflow to a Form

At this point the Workflow service takes over. If the Modeler has opted to notify the data entry users that the form is ready for use the users receive a SAS alert notification with a message telling them that the form is ready for input. The type of notification depends on how the user has configured alerts in his portal. If email is desired he gets an

email. If he wants the message in a Shared Alerts portlet then the message arrives there. All notifications are handled this way and are completely the responsibility of the Workflow service.

Then the Workflow service decides what is appropriate for each user to see. After the workflow instance is started and optional notifications are sent out the only users that can see the form in a portlet are the data-entry users selected when the form was created. If a data approver creates a portlet with the form he will only see a message telling him that it is not his time to see or interact with the form. This can become even more granular depending on which template was used to create the form. One of the templates enables the Modeler to define an ordered list of approvers with only one approver able to approve the form at a time. Using that template means that only the appropriate approver sees the form in his portlet, other approvers see a message indicating it was not their turn to approve.

All during this process the entered data is deposited into a temporary table, not into the SAS Strategy Management database. Data-entry users can enter data and save it without indicating that they are ready for it to be approved, a useful feature when you have significantly large forms to fill out.

When the data-entry user is done he submits his work. The Workflow service receives it and determines what happens next. If all the data-entry users are finished the service makes the form visible to the appropriate approver or approvers. When the approver views the form he is allowed to look at the entered data but not change any of it. The approver now has the option of accepting all the changes from all data-entry users, or accepting one or more data entry user's changes while rejecting another user, or rejecting all users' changes. The approver also can pass any desired comments to rejected data-entry users through the SAS Comment service.

If all changes are approved the Workflow service optionally notifies all data-entry users of success and the form is complete. However, if any rejection occurred the erroneous data-entry user is optionally notified and the form is returned to him in order to make corrections. He can refer to the comments made by the approver to make any necessary changes and resubmit the form, in which case the form goes back to the rejecting approver for a second attempt at approval.

After a form is completely approved by all approvers the data is then transferred into the SAS Strategy Management database. At this point the temporary data is discarded.

The Modeler can return to the Manage Forms page at any time to view a table of existing forms and associated statuses. Forms with workflow have a status value that reflects the point in the process the form is at. Of course the Modeler is not required to attach workflow to every form. SAS Strategy Management still preserves the older functionality where a form simply writes entered data immediately into the SAS Strategy Management database.

By default, the entire process described happens on a one-time basis. However the Modeler has the option to make this a recurring process when creating the form. Selecting this option means that when the form finishes final approval and the data is written to the SAS Strategy Management database the workflow cycle automatically restarts. This feature enables the Modeler to set up a company process that occurs on a regular basis and not have to restart it every time the process finishes. To allow greater control the Modeler can elect to stop any workflow cycle immediately and discard all data entered through it or to allow a recurring process to finish the current cycle and then stop.

Using the SAS Workflow service opens up some additional possibilities for the Modeler to add arbitrary functionality through modification of the workflow templates. By using SAS Workflow Studio you can check out one of the installed templates, make a small change, check it back in, and add some new process to be performed when a certain action is taken in the workflow cycle. For example refer to the section of one of the templates below:

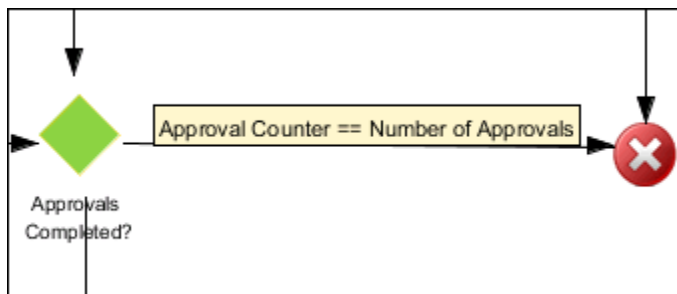


Figure 7. Altering a Workflow Template

The red circle with an X (the termination node) indicates where the workflow cycle terminates. Notice that there are lines with arrows pointing to it. One of the arrows has the label **Approval Counter==Number of Approvals**. This line originates from a green diamond that represents a decision gate labeled **Approvals Completed?**. This is the path

that the workflow travels when all of the approvers have approved the form.

Suppose that you have a SAS stored process that performs some analytics on the data entered by the data-entry users that you would like to have automatically started when the form is completed. You can insert just such a task in between the **Approvals Completed?** decision gate and the termination node by using SAS Workflow Studio. You can add all sorts of such tasks to the template: call a web service, send email, invoke SAS code, and send an HTTP request. You do need to be careful so that the original data-entry process is not broken. Fortunately the Workflow service enables you to version your change to the template. If you do break something you can have the service revert to using the original template.

AN EXAMPLE OF USING THE NEW DATA ENTRY SYSTEM

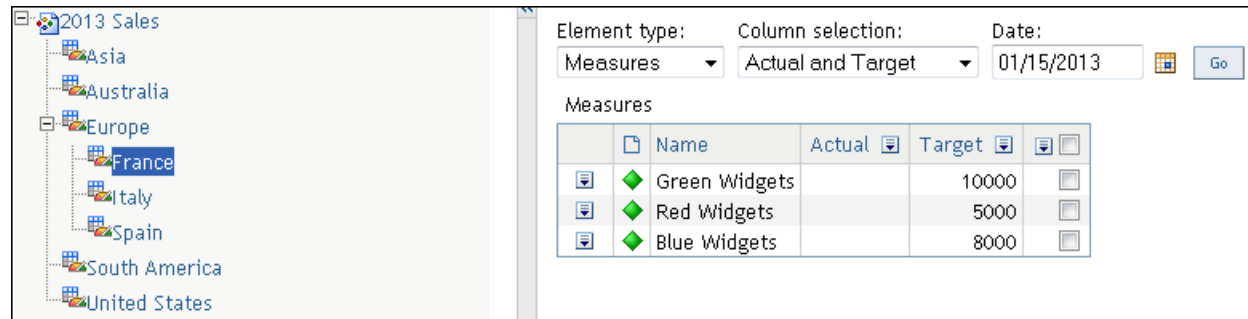
To examine the data-entry system in detail, this example describes creating a form and using it to input data. First, this example makes the following assumptions about an existing template:

- Template: **Company Financials**
- Project: **2013 Sales**
- Element Type: **Measures and Perspectives**
- Metric Attributes: **Actual, Target, and Performance**

Here is the Project 2013 Sales setup:

- Scorecards: **Europe, United States, Asia, Australia, South America**
- Grandchild scorecards for Europe: **France, Spain, Italy**
- Elements: **Green Widgets, Red Widgets, Blue Widgets**
- Metric Attributes: **Actual, Target, Performance**

This setup presents a SAS Strategy Management table view like the one below:



The screenshot shows the SAS Strategy Management interface. On the left is a tree view of the '2013 Sales' project, with nodes for 'Asia', 'Australia', 'Europe', 'France', 'Italy', 'Spain', 'South America', and 'United States'. The 'Europe' node is selected. On the right is a table view for 'Measures'. The table has columns for 'Name', 'Actual', and 'Target'. The data rows are 'Green Widgets' (Actual: 10000, Target: 10000), 'Red Widgets' (Actual: 5000, Target: 5000), and 'Blue Widgets' (Actual: 8000, Target: 8000). Above the table, there are filters for 'Element type: Measures', 'Column selection: Actual and Target', and 'Date: 01/15/2013'. A 'Go' button is also present.

	Name	Actual	Target
◆	Green Widgets	10000	10000
◆	Red Widgets	5000	5000
◆	Blue Widgets	8000	8000

Figure 8. Table View of an Example Project

Now suppose that our company has just got the actual sales figures for their European region for January 2013. The manager has two interns available to input the figures. Given that they are interns and relatively new and inexperienced, the manager knows that someone needs to confirm that the input data is correct before any report goes to the Chief Financial Officer. The manager has a more experienced office worker and an assistant manager available to double-check the figures. The manager goes to Amy, the SAS Strategy Management Modeler for the office, and tells her to set things up. It's late in the day Friday but the manager wants the interns to get started Monday. Amy groans. She had wanted to leave on time today to start her weekend. Oh well...

THE DATA-ENTRY FORM WIZARD

Amy begins by logging in to SAS Strategy Management, navigates to the 2013 Sales Project, selects **Manage Forms** and creates a new form. She gives it a name and description but decides to forego adding any named link on the form (one of the form options available).

1 - Identification 2 - Elements 3 - Columns 4 - Workflow

Enter a name and description for the new form.

Name:

Description:

Link:

Figure 9. Data-Entry Form Wizard: Identification Tab

Now she selects the **Elements** tab and notices that the change is instantaneous with no waiting for the page to refresh. “That’s nice and quick!” she thinks to herself, “Maybe I can leave work on time today.” The sales data is a Measure so she selects that from the drop-down list. All of the scorecards are displayed and since she is setting up a form for Europe she selects those scorecards.

1 - Identification **2 - Elements** 3 - Columns 4 - Workflow

- ☒ Europe
 - ☒ France
 - ☒ Green Widgets
 - ☒ Red Widgets
 - ☒ Blue Widgets
 - ☒ Italy
 - ☒ Green Widgets
 - ☒ Red Widgets
 - ☒ Blue Widgets
 - ☒ Spain
 - ☒ Green Widgets
 - ☒ Red Widgets
 - ☒ Blue Widgets
 - ☐ South America
 - ☐ United States

Save **Cancel**

Figure 10. Data Entry Form Wizard: Elements Tab

Next Amy advances to the **Columns** tab and sees that things have really changed here. Instead of seeing a large

table of available metric attributes with checkboxes for selecting a metric attribute's numeric value, text value, and read only status she sees only a drop-down list with column selections. "What's this? I am supposed to pick a column selection here?" she thinks. Amy knows that the relevant columns that need to appear on the form are the Actual column for the input data and the Target column (which in this case has already been filled in). The Actual column matters to all form users. The Target column is of interest primarily to the approvers, and no one should make any changes to the Target data.

She saves the work she has done on the form so far and navigates to the Column Selections page in the Builder. Since there is no default column selection that has what she wants she creates a General column selection, names it Actual and Target, and clicks the checkbox indicating that it is to be shared with all users. She then adds the two metric attributes to the display list and decides that the current date for each attribute should be what displays in the form. Finally she clicks the **Allow Data Entry** checkbox for the Actual attribute and leaves the one for Target unchecked. She has made the Target column read only – exactly what she wants.

The screenshot shows the 'Definition' tab of a form builder. At the top, there are two dropdown menus: 'List by:' set to 'General' and 'Selection based on:' with a 'Go' button next to each. Below these, on the left, is a tree view of 'Available attributes' with 'Metric Attributes' expanded, showing 'Actual', 'Target', and 'Performance'. An 'Add >' button is next to this tree. On the right, 'Attribute options:' are shown for two columns: 'Actual' and 'Target'. Each column has a 'Move as First', 'Move Left', 'Move Right', 'Move as Last', and 'Delete' button. The 'Actual' column has a checkbox that is checked, while the 'Target' column's checkbox is unchecked. Both columns have a '*Label:' field with 'Actual' and 'Target' respectively, and a 'Display options:' dropdown set to 'Value'. Under 'Date options:', both columns have 'Selected date:' selected with a radio button, showing '(Currently 01/10/2013)'. Other options include 'Date:' (with a date picker showing '01/10/2013' and an example '06/15/03') and 'Relative period:' (with an empty field and an example '1, -1'). At the bottom, both columns have an 'Allow Data Entry' checkbox; the 'Actual' checkbox is checked, and the 'Target' checkbox is unchecked.

Figure 11. Creating a Column Selection to Use with a Data-Entry Form

She saves this column selection, reopens her form, and looks at the **Columns** tab again. Yes, the new column selection "Actual and Target" is there so she selects it. Now the columns in the form will work just as they do in the Builder.

Now Amy moves to the **Workflow** tab. She knows that her manager intends for the two interns, Frank and Kathy, to input the data. She also knows that Ellen is to check their work and Bradley, the assistant manager for European Sales, needs to give the final approval. So Amy selects that the form have a workflow and clears the **No workflow required** check box. Her manager did not say anything about this process happening over again next month so she does not check that option but remembers it in case management decides to repeat the process.

The screenshot shows the 'Workflow' tab of a form builder. It starts with a message: 'You can define a workflow that is associated with this form.' followed by a question mark icon. Below this, there is a section titled 'Workflow' with a minus sign icon. The text says: 'To define a workflow for this form, clear the **No Workflow required** check box. By default, the workflow occurs only once.' There are two checkboxes: 'No workflow required' (unchecked) and 'Repeat this workflow each time the workflow is completed' (unchecked).

Figure 12. Data Entry Form Wizard: Workflow Tab Part 1

Next she considers how to assign Frank and Kathy as data-entry users. Both of them are set up as members of the Data Entry group only. She wants them to be notified when it is time to start so she clicks the **Send notification that a form is available for data entry** check box. Then she looks at the list of Data Entry group users and selects Frank and Kathy from the drop-down list. The work has been divided up between them so both have work to do. Amy clicks the **All users must submit the form** check box because of this division of labor.

— Assignees —

You can choose one or more users to enter data into the form.

☒ Send a notification that a form is available for data entry

From the list, select one or more users to enter data into the form and click **Add**.

Kathy ☒ All users must submit the form ☐ Any user can submit the form

Name	Remove
Frank	<input type="button" value="X"/>
Kathy	<input type="button" value="X"/>

Figure 13. Data-Entry Form Wizard: – Workflow Tab Part 2

Now Amy knows that Ellen needs to see the form first and approve both Frank and Kathy's changes before the form is passed to Bradley. This kind of form is referred to as an "Ordered Approval" in SAS Strategy Management. It is chosen by selecting the **Each user must approve the form in the assigned order** radio button.

She wants Ellen and Bradley to be notified when it is their turn to approve so she checks the notification box for approvers and then adds them. As you can see, Amy added Ellen first and Bradley second and this order is respected when the form is passed to the approvers.

— Approvers —

You can choose one or more users to approve the form after data is entered. You can also specify the order in which the users approve the form.

☒ Each approver must approve the form in the assigned order

☐ Any approver can approve the form

☒ Send a notification that a form is available for approval

From the list, select one or more users to approve the data into the form and click **Add**.

Bradley

Order	Name	Remove
1	Ellen	<input type="button" value="X"/>
2	Bradley	<input type="button" value="X"/>

Figure 14. Data Entry Form Wizard: Workflow Tab Part 3

The form is done and Amy clicks the **Save** button to save it. She can come back at any time before she starts the form workflow and modify these settings.

SETTING TEMPLATE AND PROJECT PERMISSIONS

Amy next needs to create the portlet that contains this form. Before she does so she realizes that Frank and Kathy need to be able to make changes to data in the project so she needs to update the permissions. First she goes to the Properties page of the template and enables Frank, Kathy, Ellen, and Bradley to be able to see the template. Then she goes to the Project Properties page and gives Frank and Kathy write permission to the project.







	Name	Read	Write	Delete	Administer	
	Bradley	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Ellen	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Frank	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Kathy	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	sasdemo	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Figure 15. Project Permissions

CREATING THE PORTLET

Creating the portlet requires logging into the SAS Information Delivery Portal. After doing so Amy adds the new portlet by using the Edit Page Content option and sets up the portlet as you see below:

Add Portlets to Page • Home

Create
Search

Portlet type: Performance Data Entry ▼

*Name: January European Sales Data 2013

Description: Sales data for January 2013 Europe

Keywords: January

Location (group): Strategy Management Data Entry Portlet Admin Group ▼

Figure 16. Adding the Portlet

As you can see the portlet type is Performance Data Entry. The rest of the entries are for the name and other information. The Location selection bears some explanation. Strategy Management Data Entry Portlet Admin Group is a special group installed with SAS Strategy Management that facilitates expanding the visibility of the portlet to the Data Entry and Data Entry Approvers users. Those users now can search on “January European Sales Data” to find the portlet in order to add it to their own portal page.

After Amy has done this she needs to specify some information to the portlet. She clicks the **Edit Portlet** button and the following page appears:

Figure 17. Portlet Properties: General tab

Amy needs to indicate what project and form to use along with some descriptive information. She does this on the General tab along with the desired height of the portlet. If Amy was going to be one of the data-entry users herself she would select the **Use this portlet as a data-entry portlet for the Portal Administrator** check box. After entering the above information she clicks the **Date** tab.

Figure 18. Portlet Properties: Date Tab Step 1

Amy wants the value for the current date to appear when the portlet is displayed so she selects **Current Date**. She wants the users to be able to adjust the date of the portlet so she selects the **Enable users to change the date** check box to make a date control appear on the portlet.

The date section has one more setting available:

Restrict the start and end dates that the user can navigate to in the form. If you do not restrict the date, the start and end dates of the project are used.

☐ Restrict the dates available in the form.

Start: End:

Figure 19. Portlet Properties: Date Tab Step 2

She can elect to control the range of the dates in which users can change the date. This is useful if there is some data from a previous or future period that you do not want the data-entry users to see. Amy has no such need in this example so she does not select the option.

Amy then saves the form and the page changes to the portal page. She notices that nothing displays in the portal area except a message:

You are not a data enterer or data approver for this form

This makes sense. Amy should not be allowed to enter data into the form as she is not a member of either of the relevant groups. However she still can click **Edit portlet** to modify the settings of the portlet.

At this point the form and the portlet are ready and all she has to do is start the workflow. But that is to be done next week. "This didn't take long at all!" Amy thinks to herself. She can go ahead and leave for the day.

STARTING THE WORKFLOW

Monday comes and it is time to start the form's workflow. Amy navigates to the "Manage Forms" page to see her newly created form. All she has to do now is start it by selecting the form from the list and clicking the "Start" button.

Manage Forms

Start workflow

Select a form to open or copy. You can also create a form.

Name	Last Entered	Status	Approver	Owner
Actual Sales January	1/10/13 1:59 PM	Workflow not started	Ellen,Bradley	SAS Demo User

Figure 20. Starting the Workflow

After doing so the Workflow service begins the workflow instance and she sees the message indicating the workflow started successfully.

SAS

Workflow started successfully

Figure 21. Workflow Started

At this point Amy is done. The Workflow service will handle everything from this point. Because she selected the option for the data-entry people to be notified immediately Frank and Kathy get an Alert, an email, or both depending on how they configured receiving SAS Alerts.

PERFORMING THE ACTUAL DATA-ENTRY AND APPROVAL

When Frank or Kathy logs in to the Portal they will see something like this (assume that both have added both the Shared Alert and Data Entry portlet to their Portal page):

My Alerts

[Remove](#)

Description	Date/Time
Data Entry Form "Actual Sales January" ready for data entry	10Jan13:15:31:10

January European Sales Data 2013 *Shared: Strategy Management Data Entry Portlet Admin Group*

Form: Actual Sales January

Date: Period type: Element type:

Scorecard:

Element	Actual Jan2013 Numeric	Target Jan2013 Numeric
Green Widgets	<input type="text"/>	10,000
Blue Widgets	<input type="text"/>	8,000
Red Widgets	<input type="text"/>	5,000

[Save](#) [Submit](#) [Discard Changes](#)

[Refresh Data](#)

Figure 22. Data-Entry User's Portlet

In this case Frank has a message in his Alerts portlet. Today's date is January 10, 2013 and as per Amy's setup that is the date of the data he sees. She has allowed him to see the Target values but notice that they are read-only, just as she intended. Frank can adjust the date, the scorecard he is entering data for, and the period type. Frank can save his work, discard all his changes, or submit the entire form to the approvers based on the buttons he clicks.

Frank and Kathy have divided up the data-entry job so that Frank enters the figures for France and Kathy enters the data for Italy and Spain. Frank begins to enter data. At one point he inadvertently types a negative sign before one of

the values. As he tabs out of the text field an error message appears:

Element	Actual Jan2013 Numeric	Target Jan2013 Numeric
Green Widgets	-3,000	

This cell only permits numeric values between 0 and 100000

Figure 23. Data-Entry Error and Resulting Message

This happened because Amy set up a Named Rule for the Actual values. As per the company's business rules, Actual sales cannot be less than zero. Amy added a ceiling of 100,000 figuring that such an entry was highly unlikely. And sure enough Frank incorrectly adds too many zeroes to another figure:

Element	Actual Jan2013 Numeric	Target Jan2013 Numeric
Green Widgets		10,000
Blue Widgets	1000000	

This cell only permits numeric values between 0 and 100000

Figure 24. Another Data-Entry Error

After Frank finishes entering the figures he submits the form. When he does so the portal area displays the following message:

The form has been submitted. There are no further actions available at this time.

Kathy goes through a similar experience, enters the data, submits it, and sees the same message. At this time the data-entry portion of the cycle is finished. The Workflow service notifies Ellen that she can start to approve the form data. Why only Ellen and not Bradley as well? Because Amy configured this form to use Ordered Approval workflow and Ellen is supposed to approve the form before Bradley ever sees it.

Amy's manager asks her about the status of the January figures. She logs into SAS Strategy Management and looks at the Manage Forms page:

Name	Last Entered	Status	Approver	Owner
Actual Sales January	1/10/13 4:23 PM	Awaiting approval	Ellen,Bradley	SAS Demo User

Figure 25. Form Status

The Status column clearly indicates to what point the workflow has progressed. She tells him the data-entry team has finished their work and now we are waiting on the form data to be approved.

Now Ellen receives an email telling her the form is ready to be approved. She logs on to her portal page and sees the following:

My Shared Alerts

Remove

Description	Date/Time
Data Entry Form "Actual Sales January" ready for approval	10Jan13:16:23:29

January European Sales Data 2013

Shared : Strategy Management Data Entry Portlet Admin Group

✓

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Submitter:

(all)

Form: Actual Sales January

Element	Modified by	Scorecard	Period	Actual
Green Widgets	Frank	France	Jan2013	3,000
Red Widgets	Frank	France	Jan2013	2,000
Blue Widgets	Frank	France	Jan2013	6,000
Green Widgets	Kathy	Spain	Jan2013	900
Green Widgets	Kathy	Italy	Jan2013	1,000
Red Widgets	Kathy	Spain	Jan2013	1,065
Red Widgets	Kathy	Italy	Jan2013	350
Blue Widgets	Kathy	Spain	Jan2013	255
Blue	Kathy	Italy	Jan2013	300

Approve

Reject

Figure 26. Approver's Portlet

By default Ellen sees all changes made by the two interns. She can choose to see only Kathy or Frank's changes by using the **Submitter** drop-down list. She cannot change any of the data as it is read-only. Ellen sees no issue with the data entered by Frank, but Kathy got the numbers for Spain wrong. Ellen accepts Frank's data but rejects Kathy's data requiring Kathy to re-enter it. Ellen adds a comment for Kathy to read by clicking the **Comment** button next to the **Submitter** drop down list.

January Sales data for Spain

Author: Ellen
Date: 11Jan13:12:55:50

Kathy, it looks like you got some of the numbers for Spain incorrect. The number of Red Widget sales should be 2200.

[Reply...](#)

Figure 27. Using the Comment Service

Ellen changes the Submitter drop-down list to **Frank** and clicks the **Accept** button. She sees a message asking her to confirm this choice.

Submitter: Frank

Form: Actual Sales January

Element	Modified by	Scorecard	Period	Actual
Green Widgets	Frank	France	Jan2013	3,000
Red Widgets	Frank	France	Jan2013	2,000
Blue Widgets	Frank	France	Jan2013	6,000

Approve Entries for Frank

Do you want to approve the data entries submitted by the following user: Frank?

After you approve these data entries, they are stored in the system and the entries are available for viewing.

Approve
Cancel

Approve
Reject

Figure 28. Accepting Frank's Data Entries

Now Ellen changes the **Submitter** drop-down list to **Kathy** and notices that the choice for Frank is now greyed out and not selectable. She chooses **Kathy** and clicks the **Reject** button.

Form: Actual Sales January

Submitter: Kathy

Element	Modified by	Scorecard	Period	Actual
Green Widgets	Kathy	Spain	Jan2013	900
Green Widgets	Kathy	Italy	Jan2013	1,000
Red Widgets				
Red Widgets				
Blue Widgets				
Blue Widgets				

Reject Entries for Kathy

Do you want to reject the data entries submitted by the following user: Kathy?
After you reject these data entries, the form can be corrected by this user: Kathy.

Reject Cancel

Approve Reject

Figure 29. Rejecting Kathy's Entries

The portlet area now contains a message indicating that the workflow cycle has moved back to the data-entry process. Because Kathy was the user whose data was rejected, she receives a notification and her data-entry portlet is viewable again. She can read Ellen's comment to determine what she needs to change. She does so and corrects the number of Red Widgets accordingly. Notice the alert she received for rejection:

My Shared Alerts

Remove

<input type="checkbox"/>	Description	Date/Time
<input type="checkbox"/>	Data Entry Form "Actual Sales January" ready for data entry	11Jan13:13:04:35
<input type="checkbox"/>	Data Entry Form "Actual Sales January" was rejected	11Jan13:13:04:34

January European Sales Data 2013

Shared : Strategy Management Data Entry Portlet Admin Group

Form: Actual Sales January

Date: 1/11/2013
Period type: Month
Element type: Measures
Scorecard: Spain

Element	Actual Jan2013 Numeric	Target Jan2013 Numeric
Blue Widgets	255	
Red Widgets	2,200	
Green Widgets	900	

Save

Submit

Discard Changes

Figure 30. Kathy Makes Corrections

After Kathy submits this correction Ellen is notified again. She checks Kathy's data and finds no other errors. Ellen approves it and the Workflow service sends a notification to Bradley that it is his turn to approve the data. A typical manager Bradley quickly glances at the combined entries for Kathy and Frank, figures Ellen has done the real work in validating it, and approves all changes.

At this point the workflow cycle completes. Amy sees a status that the form is now approved and informs her manager. Soon it will be time to enter the February data and Amy is considering setting up the form to automatically restart, minimizing her involvement with the process and letting her leave on time for many Fridays to come.

CONCLUSION

We have discussed the new data-entry system to a fair degree of depth. With this system the enterprise can leverage the correct category of employee to perform the data-entry task while assigning the approval process to a different level of personnel. With a more efficient user interface more work can be done in less time. Robust validation that is completely configurable preserves the integrity of one of the organization's most important resources: company data. With the ability to incorporate a workflow to guide the business process this data-entry system becomes a polished

and valuable tool as a part of SAS Strategy Management.

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