Family Management

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Contents

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Overview

Topics:

About the Family Entity and Relationship

The Family Management serves as the starting point for all tasks related to family Entity or Relationship and gives you access to all the family management features.

Note: Only Super Users and members of the MI Configuration Role can access all the family management features.

Access the Family Management Page

About This Task

The **Family Management** page allows you to define properties for a family: Entity or Relationship.

Procedure

In the **Applications** menu, navigate to **ADMIN** > **Configuration Manager** > **Family Management**. The **Family Management** page appears, displaying the list of already existing families. **Home** is selected by default. You can navigate through the alphabetical list of families and expand the family hierarchy by selecting ▶.
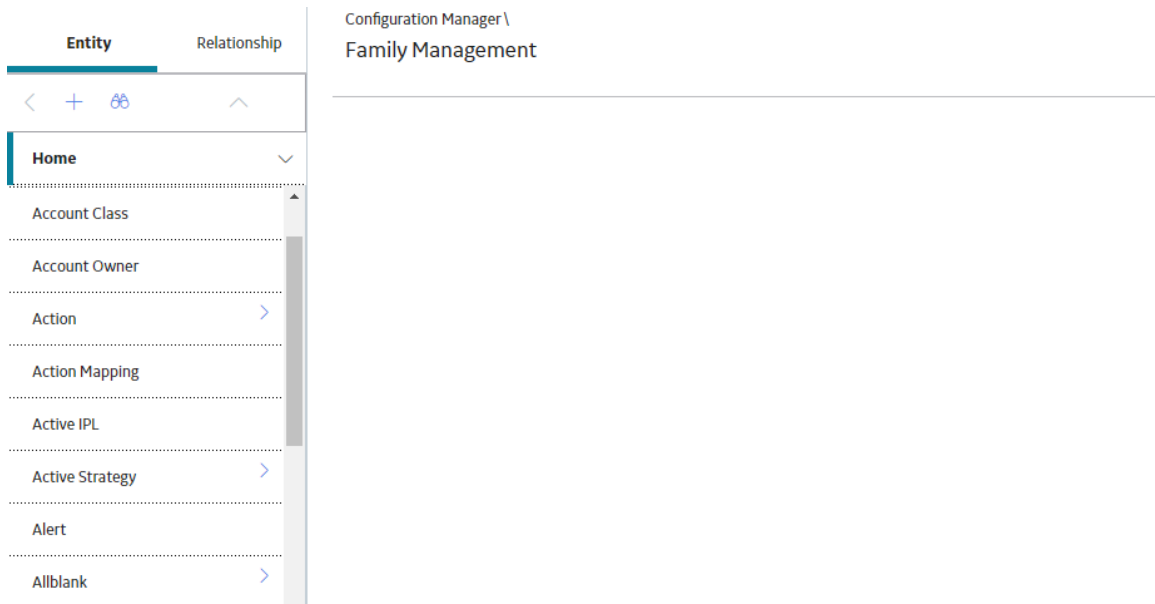
Chapter

2

Entity and Relationship Families

Topics:

About Family

Important:

APM does not support any modifications made to database tables directly or via third-party tools. Do not write data directly into or change data in database tables through any third-party tool.

Only access, add, or modify data related to APM products via approved GE Vernova procedures and processes. Accessing, adding, or modifying data by any other method may result in data corruption, and may void your APM product warranty. For more information, consult a member of the GE Vernova Professional Services department.

In APM, a family is an organizational unit that helps classify data in the database. APM uses two types of families: entity families and relationship families. Families serve to organize information within the database and to help end users locate and classify similar data.

Each APM family has a corresponding table in the database. Family tables are used to store all the data belonging to a given family, where each row in a family table corresponds to a record in that family.

APM provides many families, both entity families and relationship families, in the baseline APM database. In addition, you can create your own families. You can create families as you need to categorize all of your records and provide appropriate names for classifying the type of data that they will store for your organization.

Family Hierarchy

In APM, entity families can be organized into a hierarchy so that one family is defined as a subfamily of another family. By creating a hierarchy, you can enhance clarity.

When you look at the baseline APM database, you will see that some families are further divided into subfamilies. For example, the Recommendation family contains several subfamilies that define the types of Recommendation records that you can create.

As you configure your database, you will need to look at all of the different groupings of items that you will manage in APM. Then you need to divide these items and name each group, which will become your families. Next, you need to look for situations where one item is a type of another item. In some cases, you may want to create a family that helps form your hierarchy but to which you would not directly save records. In the end, you will probably have a number of families.

Consider an example where you create three families: Failure, Equipment Failure, Shutdown. These three families are distinctly different, but they also share some commonality: a shutdown is a type of equipment failure and equipment failure is a type of failure.

If you set up your hierarchy so that all of these families are stored at the root level along with all other families, there would be no connection between one family and another to organize the families logically. A better choice would be to set up families and subfamilies.

Each root level will be useful for defining data that is common to its sub-levels. In addition, the metadata is well ordered based on the type of data that is being collected. Since it is not an easy task to change designations after the other metadata elements have been created, you will probably find it easier to organize your database on a paper prior to creating it within the Configuration Manager.

About Families Delivered with Read-Only Properties

Baseline families can be delivered with read-only properties such that you will be not be able to perform any of the following actions on the family:

- Modifying certain properties of the family.
- Customizing the rules for a family.
- Creating new fields for the family.
- Customizing certain properties for the fields within a family.
- Deleting the fields within a family.
- Deleting the family.

In other words, families that are delivered in this way can be managed only by APM.

In the Configuration Manager, when you select a family that has been delivered in this way, the properties that you cannot modify will be displayed as read-only in the interface. In addition, some options that allow you to customize the family or its fields will be disabled.

The following table lists the UI elements that are disabled when you select a family that has been delivered with read-only properties.

Location in the Configuration Manager	Interface Element
Family Information section	**ID** text box **Physical Table Name** text box **Database View Name** text box **Delete Family** button
Family Fields section	- Create New Field - Delete Field(s) **Data Type** **Unit of Measure** list **Field ID** text box **ID Field** check box **Spread to Sub Families** check box **Hyperlink Field** check box **Formula Field** check box **Keep History?** check box **Active Status** check box

About Entity Families and Relationship Families

APM uses two types of family: *Entity* and *Relationship*.

An Entity family is an organizational unit that is used for classifying elements within your organization. Records belonging to entity families store information that is related to physical items (e.g., equipment, people, analysis, and inspections) in your company or facility. For example, Full Inspection is an entity family that APM provides in the baseline database. An individual Full Inspection would be one entity belonging to that family. Each entity family has a corresponding entity family table in the APM database. Entity family records are what you view and manage in the Record Manager.

A *Relationship* family corresponds to a database table that is used to connect two entity family tables. *Relationship* definitions can be used for each relationship family to specify the entity families to which it

relates. For example, in the baseline APM database, the Has *Reference Documents* relationship family relates the Full Inspection entity family with the Reference Document entity family.

When two entity families have been related to one another through a relationship family, records within those entity families can be linked, meaning that a connection can be created between the two records. For example, a Full Inspection record might be linked to a Reference Document record that stores information about the item that was inspected. The link itself is defined by a record that is stored in the Has Reference Documents relationship family table.

About Families Managed by Product Modules

Baseline entity families can be delivered with their *Family Is Managed By Product Module* property set to *True* such that records in that family can be managed using only the module that the family supports.

The *Family Managed by Product Modules* functionality determines how a record for family will be launched from (search). If there is a specific route assigned, each time a record in that family is opened from Search, it will use that route to open the record in the specified route. For example, if you have specified a route as *#aca/analysis/[ENTY_KEY]* in the *Asset Criticality Analysis* family, the record selected from the search results will always be routed to the specified route, i.e, *#aca/analysis/[ENTY_KEY]*.

If you have specified the route to a datasheet in the family and you access the datasheet through search, then the following links and buttons that appear on the datasheet will be active:

• **Delete**
• **Save**
• **New**

Baseline families that are delivered with this property setting exist to support specific modules.

About Manage ID Template

The APM uses Manage ID Templates to construct Record IDs and index records in the system. When a record is created in the system, a field ID is created using the values stored in the fields that are included in the ID Template. The **Field ID** is stored in the ENTY_ID system field of that record. After the **Field ID** is created, it can be used to search for that record in the APM.

For example, when you perform a search in the APM and specify a value in the search text box, by default the APM searches for the specified keyword(s) in the Field ID's of records in the database. Your search results will include records that contain your keyword(s) in their **Field IDs**.

The following image displays the results for the records that contains the value Repair in the Record ID.

Create a Family

Procedure

1. Access the Family Management page.
2. Depending on the type of family that you want to create, select **Entity** or **Relationship**.
   The list of families arranged in a hierarchy appears.
3. Navigate to the family to which you want to add the new family. To add the new family at the root level, select **Home**.
4. Select ＋.
   The **Information** section appears, displaying an empty form.
5. As needed, enter the values in the available fields.
6. Select 💾.
   A new family is created.

   Note: The newly created family is excluded from the search index by default. To add the family to the search index, you must clear the **Exclude** check box for the family in the **Search Configuration** page.

About the Entity and Relationship Sections of the Left Pane

The **Entity** and the **Relationship** pane, which appears on the left side of the **Family Management** page, displays a hierarchy of all the record and relationship families that currently exist in the APM.

At the top of the Entity/Relationship pane, there are two buttons that you can use to toggle between family tabs:

- **Entity:** Contains a hierarchical view of all of the entity families in the database. The Home family is at the highest level and serves as the parent of all families. Below the Home level, families are sorted in alphabetical order and may be organized into various sublevels.
- **Relationship:** Contains an alphabetical list of all the relationship families in the database. Relationship families store relationship definitions, which define the connections between entity families.

The search button ( ) appears below the **Entity** and **Relationship** buttons, which you can use to search for a family.

Depending on which family tab is selected, you can add an Entity or Relationship by selecting the ✛ button.

Family Information

The **Information** section stores the data and physical storage information for a family. The following table provides description of the fields that exist in the **Information** section. The information in the table reflects the baseline state and behavior of these fields. This list is not comprehensive.

Field	Description	Behavior and Usage
Active Status	Specifies the status of the family.	If the box is selected, the family is active. If the box is cleared, the family is inactive.
Authentication Required to Insert or Update Records	Specifies whether or not authentication is required to create or modify records in the family.	If this box is selected, the password associated with the Security User who is currently logged in is required each time you create or modify a record in that family, and revision history is enabled automatically for that family. If this box is cleared, records in that family can be created or modified without a password. This box is enabled only when an entity family is selected and is cleared by default.
Caption	The name of the family.	The caption that you provide will appear on the interface to identify the family. The caption is required and must be unique within the system. The name that you enter in the **Caption** box will automatically populate the **ID** box and the **Physical Table Name** box. The **Database View Name** box will be populated with the caption in the required SQL script format.

Field	Description	Behavior and Usage
Description	The description of a family.	You can enter text in the **Description** box.
Database View Name	Specifies that name of the database view that will be used by a family.	This is a required field and is populated automatically.
Enable Site Filtering	Specifies that the site filtering is selected for the family.	By enabling site filtering, the records produced by the family are assigned to a specific site, and then can be accessed by users who have been assigned to the same site. When you create a new family, by default, the check box appears selected. For custom families, you can select or clear the **Enable Site Filtering** check box. For more information about sites and site filtering, see the Sites topic.
Family Managed by Product Module	Specifies whether or not records in the family can be modified only using the associated module and not the Record Manager.	If the box is selected, records in the family can be modified only using the associated module. If the box is cleared, records in the family can be modified using the module or the Record Manager. This box is enabled only if you select an entity family. It is *disabled* if you select a relationship family.
ID	The unique ID assigned to the selected family.	The **ID** is a required field and must be unique as compared to other family IDs in the database, but it can be the same as the caption. The family is identified in the hierarchy and in the database by using this ID. **Note:** The family **ID** *cannot* start with a number.
Module Navigation URL	The URL that will be used to redirect users from the Record Manager to the associated module when viewing a record belonging to this family in the Record Manager.	This box is enabled only if the **Family Managed by Product Module** box is selected.
Physical Table Name	The name of the physical database table that exists for the family.	This is a required field and is populated automatically.

About Families with Authentication Required

Families can be configured such that authentication is required to create or update records in that family. When authentication is required, Security Users will need to re-enter their passwords before they can save changes to records in that family. In this way, an electronic signature is provided for these changes, which indicates that the user is accountable for any actions recorded under that signature (i.e., changes to data).

To configure a family in this way, you can set the **Authentication Required to Insert or Update Records** family property to *True*. Setting this property to true for a parent family does not change this setting automatically for its subfamilies. After this property is set, the next time a Security User tries to save changes to an existing record or create a new record in that family, a dialog box will appear, prompting the Security User for their password. If the password that the Security User enters does not match the password stored for that Security User, a message will appear, indicating that the authentication failed, and the record will not be saved.

Note: If you create or modify multiple records from the same family and save them at the same time, the **Re-authenticate to Complete Save** dialog box will appear only one time so that you can authenticate all the records at once.

Revision history is also enabled automatically for families with this setting, and the following additional details are displayed on the Record Manager:

- Record created by or modified by: The name of the Security User who created the record originally.
- Record created on: The date and time on which the record was created originally.

No baseline family is delivered with the **Authentication Required to Insert or Update Records** property set to *True*.

Modify a Family

Procedure

1. Access the Family Management page.
2. Depending on the type of family you want to modify, select **Entity** or **Relationship**.

   Note: You can also search for the family by selecting 👓

   The list of families arranged in a hierarchy appears.
3. In the family hierarchy, select the family that you want to modify.
   The workspace for the selected family appears.
4. As needed, modify the details of the family in the following sections:

   - **Information**
   - **Fields**
   - **Datasheets**
   - **Family Reports**
   - **Relationship Definitions**
   - **State Configuration**
   - **Associated Pages**
   - Rules and Policies

     Note: For more information, refer to the **Rules and Policies** section of the documentation.
5. Select 💾.
   The family is modified.

Modify the ID Templates

About This Task

The Manage ID Template feature describes how fields are added, removed, or arranged to modify the record ID of the records available for a given family.

Important: All the existing records must be updated, if you modify:

- The ID template (for example, adding or deleting a field, adding a delimiter, or reordering the fields in the ID template).
- The behavior of the fields.

Note: The record IDs that are constructed based on the ID Template are stored in the ENTY_ID field in the database. The ENTY_ID field can contain a maximum of 255 characters. if required, the record IDs are truncated so that they do not exceed the limit of 255 characters. For example, if the record ID has two fields, and each field can contain a maximum of 255 characters, the ENTY_ID field stores only 255 characters even though the Record ID contains 510 characters.

Procedure

1.
2. Select the family whose ID template you want to modify.
   The workspace for the selected family appears.
3. In the **Information** section, select **Manage ID Template**.
   The **Manage ID Template** window appears, displaying the current ID template and new ID template.

   Note: The **Current ID Template** section displays the existing ID template. The modified ID template will appear in the **New ID Template** section.
4. In the **Select a field to add to template** box, select the field that you want to add to the ID Template.
   The field is added to the **Field Caption** column.

   Note: If you want to remove a field from the **Field Caption** column, select the 🗑 button appearing next to the field.

   Tip: If there are multiple fields, and you want to change the order of the fields in the new ID template, drag the fields to arrange the fields in the required order.
5. If required, in the **Delimiter** column, enter a delimiter for each field.

   A delimiter is used to separate different fields (for example, an ellipsis or a dash).
6. Select **Save**.
   The ID template is modified, and a job is scheduled to update all the existing records associated with the family.

   Important: When you create a new record, the record ID for that record is created using the ID template that exists for the family at that time. If you modify the ID template of a family, the Record ID of each record in the family is replaced with a new ID.

Delete a Family

Note: You cannot delete a baseline family.

Procedure

1. Access the Family Management page.
2. Depending on the type of family you want to delete, select the **Entity** or the **Relationship**.

   Note: You can also search for a family by selecting 👓.

   The list of families arranged in a hierarchy appears.
3. In the family hierarchy, select the family that you want to delete.

4. In the right pane, select 🗑.
   The **Delete Family** window appears.
5. Select **OK**.
   The **Delete Family** window closes, and a confirmation message appears, indicating that the family is deleted.

Results

When you delete a family from the database, the following items are deleted:

- Successor relationship definitions
- Predecessor relationship definitions
- Family rules
- Family datasheets
- Family fields
- Physical tables and views associated with that family
- The State Configuration associated with that family

   Note: If the State Configuration is inherited from the parent family and you are deleting the subfamily, then only the State Configuration associated with the subfamily will be deleted.

Chapter

3

Fields

Topics:

About Fields

Fields represent the individual pieces of information that will be stored for records belonging to a given family. For example, records stored in the Full Inspection family will contain information related to full inspections. Therefore, the Full Inspection family contains fields that help define the inspection.

Each field that is defined for a family corresponds to a column in that family table. Any field that you define for a family can be displayed in a datasheet so that values can be displayed and collected via the APM application. Additionally, fields can be used in queries, graphs, reports, and other utilities to help you retrieve and display specific information about records in the database.

Field can store the following types of data:

- Letters and numbers (e.g., Equipment or Equipment-123).
- Numbers only.
- A Boolean value (i.e., true or false).
- Date and time values.

The **Fields** section allows you to create a new or edit an already existing field for a family. The main display area of the **Fields** section contains a list of all the fields currently defined for a family.

About the Field Sequence Number

All the fields within a family are assigned a field sequence number, which determines the order in which fields will be displayed, loaded, and processed during certain operations. The default field sequence number is assigned automatically by the APM system when a field is created, but you can change the field sequence for a family as needed.

In some cases, field sequence number are inconsequential and do not impact how the system functions. In other cases, particularly in cases where rules are fired, field sequence numbers are important. To make sure that these operations do not result in errors, you should define field sequence numbers for field as appropriate for the rules that exist for that family.

For example, consider a family that contains fields A, B, and C, each of which is formatted to display a list of valid values. Now, suppose that rules have been written for the field to specify that the value selected

in list A determines the available values in list B, and the value selected in list B determines the value selected in list C. On the datasheet, where you have control over the order in which fields are displayed, you can specify that list A should appear first, then list B, and finally list C. This would encourage users to select a value first from list A, then from list B, and finally list C, causing all the rules to be fired in the intended order.

In operations where you do not have control over the order in which fields are processed, however, you must rely upon field sequence numbers. In this example, you would want to set the field sequence numbers such that field A would be processed first, followed by B, and then by C.

Operations in which field sequence numbers are used include when:

- Fields are processed during an import or export.
- A record is moved from one family to another via a APM plug-In for DataStage job.

Note: Only one field sequence number can be defined for each field. This means that you will need to define field sequence numbers that are appropriate for visual and functional purposes. If you modify field sequence numbers to adjust a certain display, keep in mind the impact of those changes on the loading and processing of data.

About Field Sequence Numbers in Imports and Exports

When you export a family using the **Export** tool, the sequence number for each field is included in the FIELD_SEQUENCE_NBR on the **Fields** tab of the .XML file.

The **Families** of the export file also includes the FAMILY_APPLY_FIELD_SEQUENCES, which contains a setting that determines how field sequence numbers will be handled for each family included in the file during an import. When the FAMILY_APPLY_FIELD_SEQUENCES is set to:

- **False (the default setting for all export files created by the** APM **system)**: When the file is imported, if the family already exists in the target database, the existing field sequence numbers will not be overwritten with the field sequence numbers in the import file.
- **True**: When the file is imported, if the family already exists in the target database, the existing field sequence numbers will be overwritten with the field sequence numbers in the import file.

If you import a file that contains information for a family that does not already exist in the target database, the field sequence numbers that are defined in the import file will be applied to the fields in the new family, regardless of the value in the FAMILY_APPLY_FIELD_SEQUENCES.

The APM enforces no restrictions on duplicate field sequence numbers. If you import a file that contains a subset of fields that are defined for an existing family and any of the field sequence numbers are the same as those defined for existing fields, the import will be successful and will result in duplicate field sequence numbers within the family. Additionally, APM allows duplicate field sequence numbers for different fields within the same import file. Duplicate field sequence numbers may cause rules to function improperly and should be corrected via the Family Fields Sequence Order feature, which will reset all sequence numbers to reflect the order of the fields as displayed on the **Family Fields Sequence Order** window.

The features described above will also exist in a Microsoft Excel export file.

About Data Spreading

Grouping families into hierarchies encourages the use of data spreading. Using data spreading, fields that are common to all families within a branch of the hierarchy can be defined on a family and then spread down to subfamilies. Fields that are specific only to one subfamily can be defined directly at the sublevel. Any fields that are defined for a family will be available for display at all the sublevel. You should not over-use the data-spreading feature. The deeper a family exists in the hierarchy, the more time it takes when

querying data from the family because the query must look at many family tables to gather all the information for generating the query results.

Note: If field is baseline then it will not spread the field automatically to the subfamily. Therefore, the **spread to subfamily** check box will be disabled for all the baseline fields. In addition, the **ID Field** in the **Information** section will also be disabled.

There are three main aspects of field spreading:

• **Metadata**: When a field is spread from one family to another, the metadata (i.e., Field Identification Properties) associated with the root family field is inherited by the subfamily field when the subfamily is created. In other words, the field properties at the target level match the field properties defined at the source level. Most of this information cannot be modified on the family to which the field has been spread. The **Caption**, **Description**, and **Help Text** can be modified. Additionally, the special properties may be editable at the subfamily level, depending on the selected option.
• **Physical Tablespace**: Within the family hierarchy, a table will be created for each family, regardless of its position in the hierarchy.
• **Behavior**: For field-level behaviors you can edit parent spread behaviors but if the **Allow changing the properties of this field** check box in the Configuration Manager is unchecked, you cannot add a new behavior for the field.

Within the properties of any family field, select the **Spread to Sub Families** check box. When you do so, all subfamilies created under that family will automatically inherit that field when the subfamily is created.

Note: The changes made to parent family field would be cascaded to all the sub families. If a field is baseline then the field will not be spread to the subfamily in any circumstances. The **Spread to subfamily** check box will be disabled for all baseline fields.

After a field has been spread, clearing the **Spread to Sub Families** check box will prevent that field from being spread to additional families but will not remove the field from families to which it has already been spread. The metadata, physical tablespace, and behavior will continue to exist at the subfamily level until they are deleted manually. Clearing a field will, however, break the connection between the source field and the subfamily field, meaning that changes made to the source family field will not be applied at the subfamily level, even if the subfamily field originated through spreading.

Example A: No data spreading applied

Family	Fields
Failure	Failure ID Failure Date Failure Comments
Failure\Equipment Failure	None
Failure\Equipment Failure\Shutdown	None
Failure\Equipment Failure\Leak	Failure ID Failure Date Failure Comments Leak Substance

Example B: Data spreading applied

Family	Fields
Failure	Failure ID Failure Date Failure Comments
Failure\Equipment Failure	Failure ID Failure Date Failure Comments
Failure\Equipment Failure\Shutdown	Failure ID Failure Date Failure Comments
Failure\Equipment Failure\Leak	Failure ID Failure Date Failure Comments Leak Substance

Example A does not use data spreading. Therefore, you need to manually create all the fields in the subfamilies.

Example B uses data spreading. Example B, which uses data spreading, has only four fields as compared to the seven fields created for Example A. Example B, there are no duplicate fields, whereas Example A has three duplicate fields: Failure ID, Failure Date, and Failure Comments. In this example, data spreading multiplied over hundreds of families can help to save administrative time that is required to create and maintain the data fields, and it can help limit the size of the physical database.

About the Formula Field

A formula field is a numeric field that stores a value that has been calculated using rules. To create a formula field, you must:

- Select the **Formula Field** check box.
- Define rules for the field to specify how the field value should be calculated.

Formula fields differ from non-formula fields in two ways:

- Rather than having a base class of EntityFieldCustomization or RelationshipFieldCustomization, they have a base class of CalculatedEntityFieldCustomization (for entity family fields) or CalculatedRelationshipFieldCustomization (for relationship family fields).
- They contain Formula rules.

    Note: Formula rules must be defined manually in the Visual Studio.

When creating a formula field, you should select the **Formula Field** check box and save it before creating any rules. This will cause the field's code item to be set up as a formula field. If other rules already exist for a non-formula field and you want to change the field to a formula field, perform the following steps:

- Select the **Formula Field** check box and save the field.
- For entity fields, manually change the base class on the field's code item from EntityFieldCustomization to CalculatedEntityFieldCustomization.

- For relationship fields, manually change the base class on the field's code item from RelationshipFieldCustomization to CalculatedRelationshipFieldCustomization.

  Note: If you modify the formula for an existing formula field or define a new calculation for a field that was previously not a formula field, the value for that field will not be updated automatically in existing records. The new calculated value will be displayed in formatted query results and in Record Manager. The value stored in the database, however, will not be updated until the records are re-saved. Unformatted queries will display the value that is stored in the database.

About the Multi-Value Field

Multi-value fields are fields that can contain more than one value. The number of values allowed in a multi-value field is determined by the *No. of values per field* property, which can be defined for a new or existing field in the **Information** section. Multi-value fields can be useful in cases where you want the fields to store multiple, distinct values.

Suppose that you use the Work Order family to store records containing information about work performed on equipment in your plant. Now, suppose that the Work Order family contains the **Maintenance Type** field, which is meant to identify the type of work represented by a given Work Order record. In this case, it may not be adequate to associate a single maintenance activity with each Work Order record. For instance, some work orders may require that a piece of equipment be repaired or cleaned. If more than one activity is performed against a single piece of equipment by the same person at any given time, you may want to allow multiple values to be selected in the Maintenance Type field. Therefore, you can associate more than one activity with each Work Order record rather than creating multiple Work Order records.

To implement this behavior:

1. In the **Information** section of the field Maintenance Type, in the **No. of values per field** box, enter the number of values that you want to allow users to specify. For example, if you want to allow up to three maintenance types, enter 3.
2. Create a Valid Values behavior to populate the field Maintenance Type with a list of valid maintenance activities.
   The behavior is implemented. Now, when a user accesses the Work Order family in APM, the field **Maintenance Type** will display the list of allowed values.

When working with multi-value fields in the Configuration Manager, only a character or numeric field can be configured to contain more than one value by specifying the required value in the **No. of values per field** box. The character and numeric fields behave in a way similar to the example provided above. Binary, text, and logical fields cannot be configured as multi-value fields.

Multi-value fields are of limited use. Only record manager and datasheets are supported for multi-value fields. In other APM tools, multi-value fields are considered as text fields.

About Hyperlink Fields

A hyperlink field is a field that appears as a hyperlink in APM datasheets and provides access to an internal or external location defined through a URL. For example, the baseline Inspection family contains the fields Asset ID Link and Functional Location ID Link, both of which are hyperlink fields that provide access to the equipment or location record, as appropriate.

To create a hyperlink field, you must:

- Select the **Hyperlink** check box in the **Information** section. You can select this check box when you first create the field or at some later time.

- Define a Default Value rule for the field that specifies the hyperlink. The link must be defined using an HTML <a> tag that contains an href element. The APM system will interpret the HTML tag as it would be interpreted by any HTML viewer, where:

  ◦ The value defined for the href element defines the destination of the link.
  ◦ The text between the opening and closing <a> tags defines the text that will be displayed on the datasheet.

When you create a hyperlink field:

- You can use both internal and external URLs as the destination for hyperlink fields.
- Because the destination URL is defined within a default rule, the hyperlink will be the same for all records that are created within that family.
- Regardless of the other rules and properties that are defined for the field, the value in a hyperlink field cannot be modified by users via the datasheet.
- A given field can be either a formula field or a hyperlink field.
- You must use only character fields for hyperlink fields. Using other field types as hyperlink fields may display error messages when the associated family is accessed in APM.
- Hyperlink fields can contain only one value. If you set the **No. of Values Per Field** to more than 1 (one), the value will be ignored.

Access the Fields Section

Procedure

1. Access the Family Management page.
2. In the left pane, select **Entity** or **Relationship**.
   The associated family list appears.
3. Select the family to which you want to add a new field.
   The workspace for the selected family appears displaying the various tab. By default, the **Information** section appears.
4. Select the **Fields** tab.
   The **Fields** section appears.

Next Steps

- Create a new family field.

About System Fields

In addition to the fields that you define manually for each family, each record that you create will also contain system fields.

System fields:

- Are identified by a field ID (i.e., you cannot define a field caption for them).
- Are managed automatically as you perform actions within the APM system.
- Cannot be modified or configured in the same way that family fields can be managed or configured (e.g., you cannot define custom rules for them).
- Do not appear in many of the places where family fields appear (e.g., on datasheets).
- Can be included in queries.
- Are referenced throughout the APM product but in ways that most end users do not see (e.g., in rules and in URLs).

The following table provides a list and description of the system fields that exist for every record.

Field ID	Description	Behavior or Usage
CONTENT_GUID	A global unique identifier that uniquely identifies a record across all databases.	This field is populated automatically with a system-generated value when a record is instantiated (i.e., when you initiate the record-creation process).
ENTY_KEY	A value that uniquely identifies a record within a given database.	This field is populated automatically with a system-generated value the first time a record is saved. The ENTY_KEY field is widely using within URLs to provide a means for giving you direct access to the information associated with a specific entity.
ENTY_ID	A value generated based on the ID template.	This field is used as a display value for a record.
FMLY_KEY	A value that identifies the family to which a record belongs.	This field is populated automatically when a record is first saved with the unique key value that identifies a family within a database.
CRTBY_SEUS_KEY	A value that identifies the user who created the record.	This field is updated automatically whenever a record is created.
CRT_DT	A value that identifies the date that a record was created.	This field is updated automatically whenever a record is created.
LAST_UPBY_SEUS_KEY	A value that identifies the user who last updated the record.	This field is updated automatically whenever a record is modified.
LAST_UPDT_DT	A value that identifies the date that a record was last updated.	This field is updated automatically whenever a record is modified.
LOCK_SEQ_NBR	A value is internally by the APM system to indicate how many times a record has been modified.	This field is updated every time a record is modified.

Create a New Family Field

Before You Begin

- Create a family.

Procedure

1. Access the **Fields** section.
2. In the **Fields** section, select ＋ .
   The workspace for the new field appears, displaying the **Information** section.
3. As needed, enter values in the available fields in the Information and Behavior sections.
4. Select 💾.
   The new family field is saved and appears in the list of the fields for the family.

Next Steps

- Sequence a Field.

About Information Section Fields

When you create or modify a field, the workspace for the field appears, displaying the **Information** and **Behavior** tabs. By default, the **Information** tab is selected, and the **Information** section is displayed. The **Information** section allows you to define the basic details of the field, such as data type, field caption, and so on.

The following table lists the fields available on the **Information** section.

Fields	Description	Notes
Active Status	Determines whether or not the field is active.	This setting cannot be modified for fields that have been spread from higher-level families. Inactive fields will not appear in the following locations: • In the **Datasheet Builder**, in the **Editing <Datasheet ID>** section, in the list of available fields in the **Values** column. If a field is flagged as inactive after it already exists on a datasheet, it will not be removed from the **Available Items** section automatically. When a user views an inactive field on a datasheet, it will be disabled, and any value stored in that field will not be displayed. • In the query design, in the list of available fields: ◦ Inactive fields will not appear in the query source lists, but you can, make them appear, as needed. ◦ Inactive fields will not appear in the Fields list. If a field is flagged as inactive after it is already being used in a query, it will continue to be included in the query unless you remove it manually.
Allow changing the properties of this field	Specifies that the field can have its own rules and special properties that are different from the ones defined at the level from which the field was spread.	You can clear this check box if you want to inherit the changes from the parent family.

Fields	Description	Notes
Data Type	Identifies the type of data that will be stored in the field.	The data type controls which other properties are enabled or disabled for that type of data. This field contains a list of the following values: • **Binary**: The field can contain binary data, which is a coding system that represents data using a series of numbers. Binary fields cannot be displayed on a datasheet. • **Numeric**: The field can contain numeric data. On a datasheet, numeric fields appear as text boxes, into which users can type values, or drop-down lists, from which users can select a valid value. • **Date**: The field can contain date and time data. On a datasheet, date fields display a text box into which users can type a date and time. The pop-up Calendar is also available on datasheets and allows users to select a date and enter the desired time. • **Character**: The field can contain any combination of characters up to the limit specified by the value in the **Edit Length** text box. On a datasheet, character fields appear as text boxes, into which users can type values, or drop-down lists, from which users can select a valid value. • **Text**: The field can contain any combination of characters with no limit. On a datasheet, text fields appear as text boxes into which users can type the desired value. From text fields, users can also access the text editor, which provides more space for typing data and offers a spell-checking feature. • **Logical**: The field can contain a value that represents the equivalent of True or False. On a datasheet, logical fields appear as check boxes. Users can select the check box to specify a value of True or clear the check box to specify a value of False. If you create a new logical field for a family that already contains records, the field will be set to Null instead of False in all the existing records. • **Integer**: The field can contain data in integer format. On a datasheet, numeric fields appear as text boxes. You can enter values in the field or select a valid value from the drop-down lists. The field accepts a 32-bit value without decimals in it. • **Long**: The field can contain data in long format. On a datasheet, numeric fields appear as text boxes. You can enter values in the field or select a valid value from the drop-down lists. The field accepts a 64-bit value without decimals in it. • **Double**: The field can contain data in double format. On a datasheet, numeric fields appear as text boxes. You can enter values in the field or select a valid value from the drop-down lists. The field accepts a 64-bit floating point number. • **Decimal**: The field can contain data in decimal format. On a datasheet, numeric fields appear as text boxes. You can enter values in the field or select a valid value from the drop-down lists. The field accepts a 128-bit floating number with higher precision. **Note:** Use the Decimal data type only if you are storing financial or other similar data that requires maximum precision. For other measurement data, use float or double to reduce the computing overload.

Fields	Description	Notes
Description	Specifies an optional, textual description of the field and its function.	The field description is optional. You can enter text in the **Description** field.
Edit Length	Specifies the maximum number of characters that will be accepted for the field value.	This setting applies to character fields only. Text fields have no limit. All other fields have a limit of 50 characters. The default setting for character fields is 50, but you can type any value up to 2000 (the maximum number of characters allowed for a character field). It is recommended not to modify the field lengths of baseline APM family fields.
Field Caption	Specifies the label for the field.	To define a field caption, type a name in the **Field Caption** text box. A field caption is required for all fields and can be translated. Each field caption must be unique within its family. Defining translations for field captions alone will not ensure that translated strings appear everywhere throughout the APM application. If you want to use translated strings, you should define them both for field captions and for datasheet captions.
Field ID	Specifies the unique ID that identifies the field.	The **Field ID** is required for all fields and must be unique. After creating a field, we recommend that you do not modify the Field ID. If you need to change the field ID, you should delete the existing field and recreate it. The code item names in family rule projects are based upon family and field IDs, if the field ID matches the family ID, the APM system will not be able to create a unique code item for both the family and the field. When the field-level code item is created, it will overwrite the family-level code item. In order for the code items to be unique, the IDs must be unique.
Formula Field	Defines the field as a formula field.	You can define the field as a formula field. This setting cannot be modified for fields that have been spread from higher-level families.
Hyper Link Field	Defines the field as hyperlink field.	You can define the field as a hyperlink field. In addition to selecting this check box, you need to define a rule to create a fully functional hyperlink field. This setting cannot be modified for fields that have been spread from higher-level families.
ID Field	Designates the field as an ID field.	All fields that are designated as ID field will be spread automatically to all subfamilies of the current family. When you select the **ID Field** check box, the **Spread to Subfamilies** check box will be selected automatically to indicate that the field will be spread to subfamilies automatically. This setting cannot be modified for fields that have been spread from higher-level families. We recommend that you select this check box for any field that you plan to use in the ID Template for this family. ID fields will appear on the **Manage ID Templates** window.
Keep History	Specifies whether or not revision history will be saved for the field.	When a change is made to the value in a field, a copy of it is created and saved to a history log. You can view the revision history in the Record Manager in the APM. This setting cannot be modified for fields that have been spread from higher-level families.
No. of Values per field	Specifies the number of values that can be entered into a field.	The default value is 1 (one), but you can specify any number up to 2000. You cannot modify this property for existing fields that belong to a family for which at least one record exists. If at least one record exists in a given family, this property is read-only. If you want to change this value for an existing field, you will need to delete the field and create a new one.

Fields	Description	Notes
Physical Column	Displays information about where the field is physically stored in the database.	This field is populated automatically with the column name based on **Field Caption**. However, you can modify the **Physical Column** name. The **Physical Column** text box contains a value that specifies the name of the physical table column in which the field is stored. The **Physical Column** setting is required for all fields and must be unique. For fields that have been spread down to a subfamily from a higher-level family, the physical column name is determined by the value for the source family. For spread fields, you cannot modify this value at the subfamily level. If you change the value in the **Physical Column** text box at the subfamily level, your changes will not be saved.
Rich Text Field	Determines whether or not to apply rich text formatting to the field.	This field is available only for text fields. Select the check box to enable rich text formatting in the field. When you do so, a rich text editor toolbar appears next to the field in a datasheet, which you can use to format the text.
Spread to Sub Families	Specifies whether or not the field will be spread to subfamilies of the current family.	You can select this check box, if you want a field to exist in all subfamilies of the current family. You cannot undo spreading for specific subfamilies. This setting cannot be modified for fields that have been spread from higher-level families. If you do not want to add a field on all the subfamilies, then instead of selecting the **Spread to Sub Families** check box, you can spread fields to individual subfamilies by using the Field Chooser feature. For any field that is spread from the parent family, the **Spread From Parent** column in the **Fields** grid appears as Yes.
Spread From Parent	Specifies whether or not the field is spread from the parent family.	This option appears in the main display area of the **Fields** section. The **Spread to SubFamilies** and **Field Chooser** lets you spread a field down to the subfamilies. In the **Fields** grid, the **Spread From Parent** column indicates whether or not a given field has been spread from a family. If it is spread from the parent family, it displays the value as Yes and if it is not, then it displays the value as No.
User help text	Specifies the explanation of the field, which will be displayed to users when they are entering values in that field via the APM application.	When viewing a datasheet, you can display the user help text below the input field by selecting **Turn ON Help Text** in the menu that appears when you select the ⋮ button. The user help text is useful if the field purpose is complex. You may also want to use the user help text property to describe the behavior of the field because of the rules defined. It is recommended that you limit user help text to one sentence.

About Behavior Section Fields

Field-level behavior defines how a field behaves. You can define the behavior of a field in the **New field** window or the window that appears when you select a field to modify, using the **Behavior** box in the **Behavior** section. You can also add multiple conditions using the `If` and `Else` statements to determine if a behavior will be applied or not. The conditions in the `If` section are evaluated first. If the results are TRUE, the behaviors are applied without evaluating the `Else` section. If the results are FALSE, the conditions in the `Else` section are evaluated.

The following example shows a valid example of applying multiple `If` and `Else` conditions:

Table 1: If (This will be true if field A has a value of A, B or C)

Or	Field A	Equals	A
Or	Field A	Equals	B
Or	Field A	Equals	C

Table 2: Else (If Field A is not (A, B or C), check if it is M)

And	Field A	Equals	M

The following example shows an incorrect way of applying multiple `If` and `Else` conditions:

Table 3: If (This will never be true)

Or	Field A	Equals	A
Or	Field A	Equals	B
Or	Field A	Equals	C
And	Field A	Equals	M

```
If (field A = A or B or C and M)
    Apply Behavior1
Else (field A = M)
    Apply Behavior2
```

When you define the properties of a field, the **Behavior** drop-down list box is updated with the corresponding options. If a behavior is not supported for a field, the option is not displayed in the **Behavior** drop-down list box. For example, for a field with the Character data type, the **Format Value** option is not available. Select **Edit** to access the existing field-level behaviors, which are listed above the **Behavior** drop-down list box.

For the fields of a baseline APM family, the rules defined in the Rules Library are inherited at the field level. For a baseline family, the **Default** option indicates that the baseline rules are applied. Depending on the rules that are inherited from the Rules Library, the field may not have any behavior. For the fields of a custom family (that is, a family that is added to the APM baseline database), the **Default** option indicates that no rules exist.

In a parent family, when you set the behavior for a field that is spread to its subfamily, and if the field behavior contains a field that is not available in the subfamily, the inherited field behavior for the subfamily is set to **Default**. For example, in the parent family, if you modify Field 1 that is spread to its subfamily and you select Field 3 as the **Literal Value** for Field 1, and if Field 3 does not exist in the subfamily, the behavior of Field 1 in the subfamily is set to **Default**.

Note: When a field behavior is configured at parent family:

- If any changes are made after saving the parent family, the spread of the specific behavior will not be spread down again and must be made on the child family field.
- If a child family field has a behavior that is spread down, you cannot create a second behavior only on the child family. A new behavior needs to be created on the parent.

The following table describes the options available in the **Behavior** drop-down list box.

Parameter	Description	Parameter Option

Asset Finder	Specifies use of the Asset Finder to select a value in the field. This behavior can be applied only to character fields. If you apply this behavior, you may also apply Required and/or Disabled behaviors. It cannot be combined with any other behaviors.	This behavior is designed to be used with fields that store the entity key of a related Asset record. If you select this option, the field displays the icon which you must select to open the Asset Finder selection dialog and choose a single asset from the hierarchy. You cannot type into this field.
		
		To add the behavior, perform the following steps:
		
		1. Select the field where you want to add the default behavior.
		2. In the **Add New** drop-down list box, select **Finder Dialog**.
		3. In the **Finder Type** drop-down list box, select **Asset Finder**.
		4. In the **Display Property** drop-down list box, select one of the following:
		
		   • **Key** to display the Entity
		   • **ID** to display the Entity ID
		
		   The displayed value will be shown with a hyperlink to open the asset in Record Manager.
		
		5. Select .
		
		Note: For the query with asset parameter, the literal value for **Home** asset should be set to **-1**.

Default	Defines the default value for a field.	If you select this option, the field is populated with the default value. You cannot use this behavior in fields with the Binary data type.
		
		To add the default behavior, perform the following steps:
		
		1. Select the field where you want to add the default behavior.
		2. In the **Behavior** drop-down list box, select **Default**.
		3. Select **Add**.
		4. In the **Left Side Constant** box, enter the default value.
		
		   Note: If the Data Type of the field is Date, you can select the **Current Date** check box to display the current date as the default value.
		
		   or
		
		   If you want the default value to be populated from another field, in the **Left Side Field** drop-down list box, select the field from which you want to populate the value.

Parameter	Description	Parameter Option

Disabled	Determines whether the field should be disabled.	If you select this option, the field is disabled and cannot be modified. You cannot use this behavior in fields with the Binary data type.
		
		To add the Disabled behavior to a field, perform the following steps:
		
		1. Select the field that you want to disable.
		2. In the **Behavior** drop-down list box, select **Disabled**.
		3. Select **Add**.
		4. In the **Condition** drop-down list box, select one of the following options:
		
		   • **Is New:** Select this if the record is new.
		   • **Is Not New:** Select this if the record is not new.
		   • **Security Group:** Select this if the current user belongs to a Security Group.
		
		   Note: If the condition is Security Group, in the **Right Side Constant** drop-down list box, select the required Security Group. Alternatively, you can select a field in the **Right Side Field** drop-down list box to specify the Security Group.
		
		   • **Security Group Query:** Select this to run a query to determine the Security Group to check. The value is taken from the first column in the query.
		
		   Note: If the condition is Security Group Query, in the **Right Side Constant** drop-down list box, select the required catalog query.
		
		   • **None:** Select this if you do not want to specify the conditions mentioned earlier.
		
		5. In the **Operator** drop-down list box, select any one of the following options:
		
		   • **Assign False:** Select this if the field is never disabled.
		   • **Assign True:** Select this if the field is always disabled.
		   • **GreaterThan:** Select this if you want to disable the field based on the comparison of two fields. You can add the field values that need to be compared in the **Left Side Constant** and **Right Side Constant** boxes. Alternatively, you can select the fields in the **Left Side Field** and **Right Side Field** drop-down list boxes. If the value in the **Left Side Field** drop-down list box is greater than the value in the **Right Side Field** drop-down list box, the field is disabled.
		   • **Equal:** Select this if you want to disable the field based on the comparison of two fields. You can add the field values that need to be compared in the **Left Side Constant** and **Right Side Constant** boxes. Alternatively, you can select the fields in the **Left Side Field** and **Right Side Field** drop-down list boxes. If the field values are equal, the field is disabled.
		   • **GreaterThanEqual:** Select this if you want to disable the field based on the comparison of two fields. You can add the field values that need to be compared in the **Left Side Constant** and **Right Side Constant** boxes. Alternatively, you can select the fields in the **Left Side Field** and **Right Side Field** drop-down list boxes. If the value in the **Left Side Field** drop-down list box is greater than or equal to the value in the **Right Side Field** drop-down list box, the field is disabled.
		   • **IsFalse:** Select this if you want to disable the field when the value is not equal to a specific value. You can add the value that needs to be compared in the **Left Side Constant** box. Alternatively, you can select a field in the **Left Side Field** drop-down list box. If the value is false, the field is disabled.
		   • **IsNotNull:** Select this if you want to disable the field if the value in a field is not null. You can add the value that needs to be compared in the **Left Side Constant** box. Alternatively, you can select a field in the **Left Side Field** drop-down list box. If the value is not null, the field is disabled.
		   • **IsNull:** Select this if you want to disable the field if the value in a field is null. You can add the value that needs to be compared in the **Left Side Constant** box. Alternatively, you can select a field in the **Left Side Field** drop-down list box. If the value is not null, the field is disabled.
		   • **IsTrue:** Select this if you want to disable the field if the Boolean value in a field is true. You can add the value that needs to be compared in the **Left Side Constant** box. Alternatively, you can select a field containing the Boolean value in the **Left Side Field** drop-down list box. If the value is true, the field is disabled.
		   • **LessThan:** Select this if you want to disable the field based on the comparison of two fields. You can add the field values that need to be compared in the **Left Side Constant** and **Right Side Constant** boxes. Alternatively, you can select the fields in the **Left Side Field** and **Right Side Field** drop-down list boxes. If the value in the **Left Side Field** drop-down list box is less than the value in the **Right Side Field** drop-down list box, the field is disabled.

Parameter	Description	Parameter Option
Format Value	Determines the formatting rules that should be applied to the value of a field.	You can define the format of the field value. Only the Numeric and Date data types support the Format Value behavior. You can use only one format behavior for a field. To add the Format behavior to a field, perform the following steps: 1. Select the field where you want to add the format. 2. In the **Behavior** drop-down list box, select **Format**. 3. Select **Add**. 4. In the **Format Value** drop-down list box, select the format that you want to use. **Note:** After you select a format, an example value with the selected format appears next to the **Format Value** drop-down list box. 5. Select 💾. **Note:** In the **Format Value** drop-down list box, if you select the custom format, then the standard numeric format string values defined by Microsoft are used. For more information, refer to Standard numeric format string. For example, to display a date in 2021-01-31 format, you need to specify yyyy-MM-dd.
Hidden	Determines whether a field should be shown or hidden.	You can select this behavior to hide a field. You cannot use this behavior in fields with the Binary data type. To add the Hidden behavior to a field, perform the following steps: 1. Select the field that you want to hide. 2. In the **Behavior** drop-down list box, select **Hidden**. 3. Select **Add**. **Note:** The configuration options for the Hidden behavior is same as that for the Disabled behavior. To configure this behavior, refer to the configuration steps (that is, Step 4 and Step 5) in the row that describes the Disabled parameter option. 4. Select 💾.
Masked Field	Determines whether the characters entered in the field should be masked.	You can select this behavior to mask the characters entered in the field. The characters in the field are masked with the special character *. You can use this behavior only in fields with the Character data type. You can use only one Masked Field behavior in a field. To add the Masked Field behavior to a field, perform the following steps: 1. Select the field that you want to mask. 2. In the **Behavior** drop-down list box, select **Masked Field**. 3. Select **Add**. 4. Select 💾.

Parameter	Description	Parameter Option

Query Finder	Specifies whether you want to use the Query Finder to select a value in the field. If you apply this behavior, you may also apply the Required and/or Disabled behaviors. You cannot combine Query Finder with any other behavior.	If you select this option, the field displays the ⚬⚬⚬ button. When you select the ⚬⚬⚬ button, the Query Finder window appears. You can then select one or more values from the query results. You cannot type a value in this field. You can select X to remove the value from the field.
		
		To add the Query Finder behavior, perform the following steps:
		
		1. Select the field in which you want to add the Query Finder as the default behavior.
		2. In the **Add New** drop-down list box, select **Finder Dialog**.
		3. In the **Finder Dialog Type** drop-down list box, select **Query Finder**.
		4. In the **Query** box, select ⚬⚬⚬, select a query form the catalog browser, and then select **Open**.
		5. If you want to allow multiple items to be selected, select the **Is Multiple?** check box.
		
		    Note: If you select the **Is Multiple?** check box, the **Additional Fields to Update** section is disabled.
		6. In the **Value Column** box, enter the column index of the query column to use as the value that will be saved to the field in the database.
		7. If the query contains prompts, in the **Parameters** section, select a field or enter the literal value for each query prompt.
		
		    Note: If selecting a field as a prompt value, you cannot use the same field for which you are adding the Query Finder behavior.
		8. If you want to use values from the query to populate additional fields in the family, in the **Additional Fields to Update** section, select ➕ to add a row, then select a field in the **Field to Update** drop-down list box, and then enter the query column index in the **Column Index** box.
		9. Select 💾.
		
		Note:
		
		- The Query Finder displays all the columns that are configured to display in the query that you select. The query may contain additional fields that are hidden, and these columns can be used in the behavior configuration.
		- The column that you select from the query to populate a field must contain a matching data type as follows:
		
		| Data Type of the Field
			Accepted Data Types of the Query Column

---	---
Character	Any
Text	Any
Numeric	Numeric, Integer, Double, Decimal
Date	Date
Boolean	Boolean
Integer	Integer
Long	Integer, Long
Double	Integer, Double	

Parameter	Description	Parameter Option
Required	Determines whether a value must be entered in a field before you save a record in the family.	You can select this behavior if you want the field to be required to save a record. If a value is not entered in a required field, an error message appears when you save the record. You cannot use this behavior in fields with the Binary data type. To add the Required behavior to a field, perform the following steps: 1. Select the field that you want to mask. 2. In the **Behavior** drop-down list box, select **Required**. 3. Select **Add**. **Note:** The configuration options for the Required behavior is same as that for the Disabled behavior. To configure this behavior, refer to the configuration steps (that is, Step 4 and Step 5) in the row that describes the Disabled parameter option. 4. Select 💾.

RFC Finder	Specifies use of the Remote Function Call (RFC) Finder to select a value in the field. It is used to retrieve data from third-party applications such as SAP. This behavior can be applied only to character fields, which hold a single value. If you apply this behavior, you may also apply Required and/or Disabled behaviors. It cannot be combined with any other behaviors.	To add the behavior, perform the following steps:
		
		1. Select the field where you want to add the RFC Finder as the default behavior.
		2. In the **Add New** drop-down list box, select **Finder Dialog**.
		3. In the **Finder Dialog Type** window, select **RFC Finder**.
		4. In the **System ID** box, select the EAM System.
		5. In the **Value Column** box, enter the column ID of the table.
		6. In the **Function Name** box, enter the remote function name.
		7. In the **Table Name** box, enter the table name. Only the Table response type is supported.
		8. If the remote function requires additional parameters to be configured through the Input Parameters section, select ➕, and then enter **Parameter Id**. You can enter **Parameter Value** or select **Field ID**.
		
		    Note: If both the parameter value and field ID are available, field ID takes precedence.
		
		9. If you want to use values from the query to populate additional fields in the family, in the **Additional Fields to Update** section, select ➕, and then select a field that needs update and then select **Table Column ID** from the Table RFC response.
		    You can select or clear the **Clear Values** check box when you want additional family fields to clear the values when user selects ✕ in the datasheet.
		
		    Note: Additional fields to update is supported only for Numeric and Character fields.
		
		10. Select 💾.
		
		Note: If all the parameters such as Table Name, Function Name, and Input Parameters are not configured with the correct values, there can be an issue in showing the results in the datasheet.

State Management	Determines if the State Management ID should be displayed in the State Management field.	You can use this behavior only in State Management fields. The field caption can be localized. To add the State Management behavior to a field, perform the following steps: 1. Select the state management field to which you want to add the behavior. 2. In the **Behavior** drop-down list box, select **State Management**. 3. Select **Add**. 4. Select the required state management. 5. Select 💾.

Parameter	Description	Parameter Option
Validate	Defines the validation rules that will be used to validate values that are entered in a field.	You can use this behavior if you want to force the values in a field to conform to specified limits or criteria that are considered valid. You can use this behavior only in fields with the Numeric and Date data types. To add validations to a field, perform the following steps: 1. Select the field to which you want to add the validations. 2. In the **Behavior** drop-down list box, select **Validate**. 3. Select **Add**. 4. In the **Operator** drop-down list box, select any one of the following options: • **GreaterThan:** You can add the field values that need to be compared in the **Left Side Constant** and **Right Side Constant** boxes. Alternatively, you can select the fields in the **Left Side Field** and **Right Side Field** drop-down list boxes. If the value in the **Left Side Field** drop-down list box is greater than the value in the **Right Side Field** drop-down list box, the validation is successful. • **Equal:** You can add the field values that need to be compared in the **Left Side Constant** and **Right Side Constant** boxes. Alternatively, you can select the fields in the **Left Side Field** and **Right Side Field** drop-down list boxes. If the value in the **Left Side Field** drop-down list box is equal to the value in the **Right Side Field** drop-down list box, the validation is successful. • **GreaterThanEqual:** You can add the field values that need to be compared in the **Left Side Constant** and **Right Side Constant** boxes. Alternatively, you can select the fields in the **Left Side Field** and **Right Side Field** drop-down list boxes. If the value in the **Left Side Field** drop-down list box is greater than or equal to the value in the **Right Side Field** drop-down list box, the validation is successful. • **LessThan:** You can add the field values that need to be compared in the **Left Side Constant** and **Right Side Constant** boxes. Alternatively, you can select the fields in the **Left Side Field** and **Right Side Field** drop-down list boxes. If the value in the **Left Side Field** drop-down list box is less than the value in the **Right Side Field** drop-down list box, the validation is successful. • **Less Than Equal:** You can add the field values that need to be compared in the **Left Side Constant** and **Right Side Constant** boxes. Alternatively, you can select the fields in the **Left Side Field** and **Right Side Field** drop-down list boxes. If the value in the **Left Side Field** drop-down list box is less than or equal to the value in the **Right Side Field** drop-down list box, the validation is successful. • **Not Equal:** You can add the field values that need to be compared in the **Left Side Constant** and **Right Side Constant** boxes. Alternatively, you can select the fields in the **Left Side Field** and **Right Side Field** drop-down list boxes. If the value in the **Left Side Field** drop-down list box is not equal to the value in the **Right Side Field** drop-down list box, the validation is successful. • **BetweenExclusive:** Defines that the value entered in the field must be between the two specified values but cannot include the specified values. You can add the field values in the **Left Side Constant** and **Right Side Constant** boxes. Alternatively, you can select the fields in the **Left Side Field** and **Right Side Field** drop-down list boxes. If the value is between the **Left Side Field** and **Right Side Field** drop-down list boxes (excluding the specified values), the validation is successful. • **BetweenInclusive:** Defines that the value entered in the field must be between the two specified values and can include the specified values. You can add the field values in the **Left Side Constant** and **Right Side Constant** boxes. Alternatively, you can select the fields in the **Left Side Field** and **Right Side Field** drop-down list boxes. If the value is between the **Left Side Field** and **Right Side Field** drop-down list boxes (including the specified values), the validation is successful. **Note:** You can add multiple validations behaviors using **If** and **Else** conditions. 5. Select .

Parameter	Description	Parameter Option

Picklist	Defines a list of values that will be available for selection.	You can use this behavior to display a list of values for selection, only for the fields with the Character or Text data type.
		
		To add this behavior to a field, perform the following steps:
		
		1. Select the field to which you want to add the predefined values.
		2. In the **Behavior** drop-down list box, select **Picklist**.
		3. Select **Add**.
		4. In the **Operator** drop-down list box, select any one of the following options:
		
		   • **ConstantList:** Select this option if you want to define constant values for the drop-down list. When you select this option, a text box appears. In the text box, you can enter a value that should appear in the drop-down list box, and then select **Add**.
		   • **QueryList:** Select this option if you want to define the list of values that should appear in the drop-down list box by using a query. When you select this option, the **Select a Query** box appears, where you can select the query from which you want to populate the values. The values in the first column of the query result are used for displaying values in the drop-down list box of a datasheet.
		   • **SystemCodeList:** Select this option if you want to define the list of values that should appear in the drop-down list box by using a system code table. When you select this option, the **Choose** box appears, where you can select the system code table from which you want to populate the values.
		   • **SystemCodeListRef:** Select this option if you want to define the list of values from system code values based on the system code reference table and static system reference code.
		   • **SystemCodeListRefField:** Select this option if you want to define the list of values from system code values based on the system code reference table and a field that contains the system reference code value.
		
		5. Select 💾.

Note: You can delete any existing behavior or a condition in a behavior by selecting 🗑 next to the behavior or condition.

Example for APM Query with Parameters

For example, consider a family 'Equipment' with three fields Equipment (EQPT), Functional Location (FL), and Manufacturer (MFGR).

The Manufacturer field contains the following values:

- ACME
- BURNS
- SMITH

The Equipment field contains the following values:

- Compressor
- Heat Exchanger
- Motor
- Pump
- Tank

The Functional Location contains the following values:

- Roanoke
- Bangalore
- San Ramon

To populate the MFGR field based on the EQPT and FL, you must create the following three queries:

- Functional Location
- Equipment
- Manufacturer

Functional Location

Create an APM Query for the FL field such that all functional locations are listed.

The following image shows the sample query for functional location.

```
SELECT  TOP 50 [MI_EQUIP000].[MI_EQUIP000_FNC_LOC_C] "Functional Location"
, [MI_EQUIP000].[MI_EQUIP000_FNC_LOC_DESC_C] "Functional Location Descripti"
FROM [MI_EQUIP000]
WHERE [MI_EQUIP000].[MI_EQUIP000_FNC_LOC_C] IS NOT NULL
```

Equipment

Create an APM Query for the EQPT field that lists the equipment for a given Functional Location. In the **Behavior** section of the field, in the **Picklist** behavior, select the **QueryList** option and map the Functional Location parameter of the query with the FL field such that the values in the EQPT field in the datasheet are displayed based on the values in the FL field.

The following image shows the sample query for Equipments.

```
SELECT [MI_EQUIP000].[MI_EQUIP000_EQUIP_ID_C] "Equipment ID"
FROM [MI_EQUIP000]
WHERE [MI_EQUIP000].[MI_EQUIP000_FNC_LOC_C] LIKE (? :s :caption='FnLoc')
```

The following image shows the mapping of parameters.

Manufacturer

Create an APM Query, for MFGR field, that lists the manufacturers for an Equipment. In **Field Behavior** section, in the **Picklist** behavior, select the **QueryList** option and map the Equipment parameter of the query with the EQPT field such that the values in the MFGR field in the datasheet are displayed based on the values in the EQPT field.

The following image shows the sample query for Manufacturer.

```
SELECT [MI_EQUIP000].[MI_EQUIP000_MFR_C] "Manufacturer"
FROM [MI_EQUIP000]
WHERE [MI_EQUIP000].[MI_EQUIP000_EQUIP_ID_C] = (? :s :caption='EqId')
```
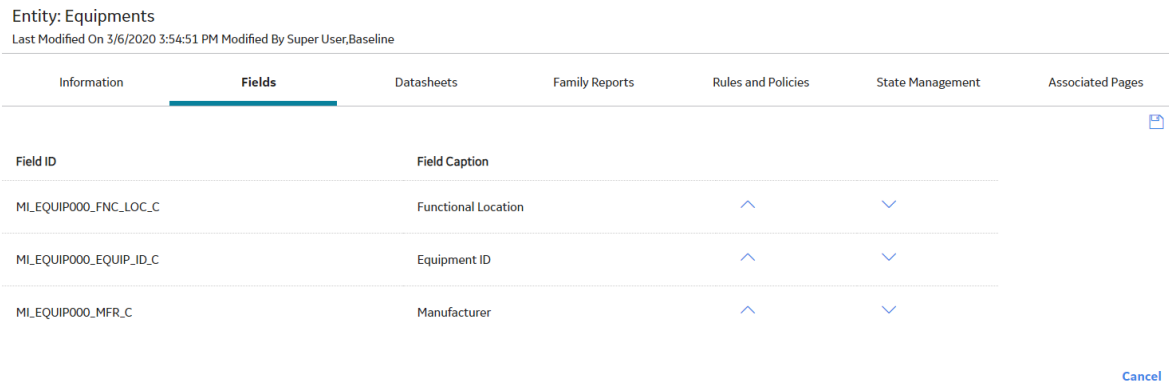
The following image shows the mapping of parameters.
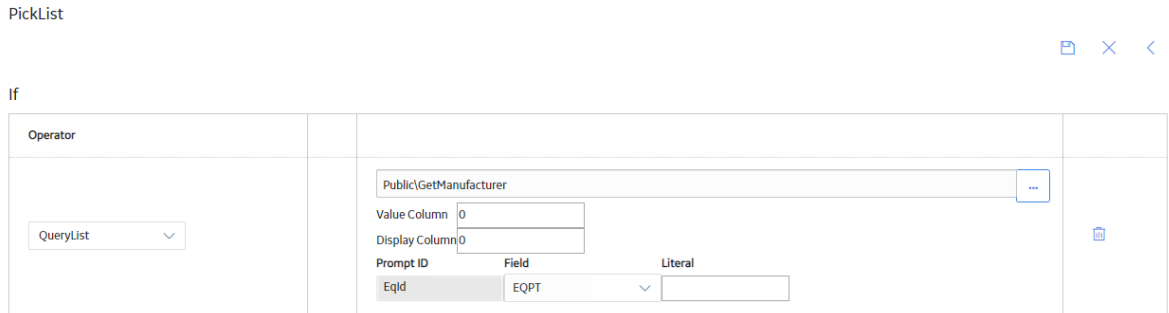
After the queries are created, in the **Family Fields Sequence Order** window, you must arrange the queries in the following order:

1. Functional Location

2. Equipment

3. Manufacturer

The following image shows an example of query arrangement in the **Family Fields Sequence Order** window.

Assume that the Functional Location *Roanoke* has the equipments *Pump* and *Motor* and with these queries in place, in a datasheet of the *Equipment* family if a user selects **Roanoke** in the **FL** drop-down list box, the **EQPT** drop-down list box will contain only *Pump* and *Motor*. And, if you select **Motor** in the **EQPT** drop-down list box, the manufacturer associated with the equipment will be populated in the MFGR field.

Create a Valid Values List from a System Code Table

About This Task

You can configure a field to contain a list of System Codes defined in a System Code Table. When you create a **Valid Values** list in this way, the drop-down list of valid values will display any System Codes that are defined in the specified System Code table. The list will be updated automatically to reflect changes

made to the System Code table. The **Valid Values** list created by the using the **Behaviors** section is restricted (i.e., the users will only be allowed to select from the values that are displayed in the list). They will not be able to enter their own values in the list.

Note: Only active System Codes that are constructed via System Codes and Tables feature will appear in valid values lists.

Procedure

1. Access the **Fields** section.

2. In the **Fields** section, select ✛ .
   The workspace for the selected field appears, displaying the **Information** section.

3. As needed, enter values in the available fields.

4. Select the **Behavior** tab, and then in the **Valid Value** box, select **System code and Table**.
   The **Select Valid Values System Code Table** box appears.

5. In the **Select Valid Values System Code Table** box, select the System Code Table from which you want to build the list of valid values.
   The list of the filter types appear.

6. If you want the list of valid values to include all of the System Codes in the selected System Code table, select the **No Filter** check box.

   Note: If the System Code table that you selected in the previous step does not contain any references, only the **No Filter** option is available.

   -or-

   If you want the list of valid values to contain only the System Codes that are referenced from a System Code in another System Code table, then select the **Static Filter** check box.

   The **Choose System Code Table** and **Choose System Code** boxes appears.

   a) In the **Choose System Code Table** box, select the System Code table that will be used as the filter.
      The list of System Codes appears in the **Choose System Code** table.

   b) In the **Choose System Code** box, select the required System Code.

      Note: The list will contain only the System Codes from the source System Code table that are referenced by the System Code that you select here.

7. Select 🖫 .
   A list of valid values is created.

Example of Filtering System Code List to Display Referenced System Codes

By using the Static Filter option, you can create valid value list to display system codes that are referenced from another System Code. Consider, for example, two System Code Tables: Manufacturer (MFGR) and Equipment Type (EQPT).

- The Equipment Type table contains the following values:

  ◦ Compressor
  ◦ Heat Exchanger
  ◦ Motor
  ◦ PumpTank

- The Manufacturer table contains the following values:

  ◦ ACME

◦ BURNS
  ◦ SMITH

If the manufacturers ACME and BURNS both produce motors, then, in the Equipment Type System Code Table, you can add references to the ACME and BURNS System Codes in the Motor System Code . The references would indicate that the two manufacturers are associated with that equipment type.

Now, assume that you have a family called Motor that will be used to store information about the motors in your company. Also, assume that the Motor family contains the Manufacturer (ASSET_MANUF_CHR) field, which is intended to identify the name of the company that manufactures a given motor. In this case, you could use a Valid Values rule to create a list for this field that contains all values from the Manufacturer (MFGR) System Code Table. But, since only some manufacturers produce motors, it would be better to filter the list to contain only the valid manufacturers: ACME and BURNS.

Assuming that the System Code references described above are already in place, you can use the field behavior to implement this functionality by generating a Valid Values behavior for the Manufacturer (ASSET_MANUF_CHR) field that is built from the Manufacturer System Code Table and contains a Static Filter to include only the values that are referenced by the Motor System Code in the Equipment Type (EQPT) System Code Table.

Sequence a Family Field

About This Task

All the fields within a family are assigned a field sequence number, which determines the order in which fields will be displayed, loaded, and processed during certain operations. The default field sequence number is assigned automatically by the APM system when a field is created, but if you want, you can change the field sequence for a family. The **Family Fields Sequence Order** window contains a list that displays all the fields in a given family. The list does not include the field sequence numbers, instead, the order in which the fields are listed corresponds to the sequence number defined for each field.

When you select the **Save** on the **Family Fields Sequence Order** window, the fields will be assigned a sequence number that corresponds to the order in which they are displayed in the list on the **Family Fields Sequence Order** window. The first field in the list will be assigned a 1, the second field will be assigned a 2, the third field will be assigned a 3, and so on. You can reorganize fields within the list to determine the sequence number that will be assigned to each field. Note that the actual field sequence number values are unimportant. It is the order of each sequence number relative to the sequence numbers defined for other fields in the same family.

Procedure

1. Access the **Fields** section.

2. Select ⌄.
   The **Family Fields Sequence Order** window appears.

   The order of the fields in the list is an exact representation of the field sequence. The list contains all fields that exist for the selected family, including any fields that have been spread from a family.

3. In the list of fields, select the field(s) whose order you want to change.

4. To move the field(s) up in the list, select ⌃.

   -or-

   To move the field(s) down in the list, select ▶.

5. When you are finished reordering the fields, select **Save**.

Your changes are saved.

Add Existing Fields by Using the Field Chooser

About This Task

The Field Chooser feature allows you to add fields to a subfamily. The Field Chooser displays only the fields that have been defined for one of the parent families of a subfamily and that have not been spread to that subfamily. After you add a field to a subfamily via the Field Chooser, you can view the field properties as you would for any field via the **Edit Field** window.

Procedure

1. .
2. In the left pane, in the **Entity** section, select the subfamily to which you want to add a field.
   The workspace for the selected family appears.
3. Select the **Fields** tab, and then select **Field Chooser**.
   The **Field Chooser** window appears, displaying the fields defined for the parent families of the current subfamily that have not yet been spread. This list contains the following information.

   - **ID**: The ID of the field.
   - **Caption**: The caption of the field.
   - **Parent Family**: The name of the parent family that contains this field.
4. In the row for each field that you want to add to the subfamily, select the check box, and then select **Add**.
   The **Field Chooser** window closes and a confirmation message appears, indicating that the fields have been added to the selected subfamily. The fields appear in the list in the **Fields** section.

Modify the Family Field Properties

Before You Begin

When modifying field properties, consider the following:

- Depending on whether or not a given field has been spread down to the current family from a higher-level family, some field properties may not be editable.
- Some attributes of baseline fields cannot be modified. If you attempt to make a modification that is not allowed, an error message will appear, and your change will not be saved.
- Some baseline fields cannot be modified because they belong to a family that has been delivered with read-only properties. When you view the properties for a field that meets this criteria, some field properties will not be editable.

Procedure

1. Access the **Fields** section.
2. From the list, select the field that you want to modify.
   The workspace for the selected field appears, displaying the **Information** section.
3. As needed, modify values in the available fields in the **Information** and **Behavior** sections.
4. Select 💾.
   Your changes are saved.

Delete the Family Field

Procedure

1. Access the **Fields** section.
2. In the **Fields** page, select the family field that you want to delete.
   The workspace for the selected field appears, displaying the **Information** section.
3. Select 🗑.
   The **Delete Family Field** window appears.
4. Select **OK**.
   A confirmation message appears, indicating that the field is deleted. The field does not appear in the **Fields** section.

   Note: A field that has been spread down or copied from a parent with Field Chooser cannot be deleted (🗑).

Chapter

4

Datasheets

Topics:

Datasheets

About Types of Datasheets

APM offers the following types of datasheets:

- **Master/Detail datasheet:** A form that lets you display a record and all the records that are linked to it through a given relationship definition.

- **Custom datasheet:** Datasheets that can be customized to display fields in a more advanced form. APM provides two types of layouts for custom datasheets, the tabular layout and the custom layout.

    - Tabular layout organizes the datasheet content in a standard arrangement with row labels and up to four columns of data per row, and cells of equal size.
    - Custom layout allows for less uniform datasheet configurations with more options for variable cell sizing and grouping items.

About Multiple Datasheets

APM lets you define more than one datasheet for a given family. For example, equipment records may contain many pieces of data including maintenance, engineering, reliability, cost, inspection, design, drawing, project, etc. A datasheet containing all these data fields would be very large and difficult to navigate.

To make data entry easier, an administrative user can create subsets of the data based on specific purposes (e.g., engineering data in one datasheet, inspection data in another, cost data in a third, and so forth). When you access a record, you can select the datasheet that represents your needs.

When more than one datasheet exists for a family, you will be able to select the appropriate datasheet when you create and view a record. The name of the currently selected datasheet appears at the top of any record you are viewing.

About Field Rules

The field properties and rules that you define for family fields determine how fields will behave when users view them in datasheets.

If you have defined a rule for a field that will affect the way it appears or behaves in a datasheet, you may want to test the field rule. To do so, follow this workflow:

1. Configure the family field properties as needed.
2. Add the field to the datasheet.
3. Compile the family.
4. Open a new datasheet for the family.

If you need to make additional changes to a field, repeat this workflow, but omit step 2. After you add the field to the datasheet, any changes you make to the field rule will be applied automatically to the datasheet.

About Master/Detail Datasheets

A master/detail datasheet is a custom form that lets you display a record and all the records that are linked to it through a given relationship definition. Master/detail datasheets can be configured for any entity family using any relationship definition that relates it to another entity family.

For example, in the baseline APM database, the Calibration Template family is related to the Calibration Template Detail family through the Has Template Details relationship. The APM product includes a master/detail datasheet that allows you to open a Calibration Template record while simultaneously viewing, creating, and modifying linked Calibration Template Detail records.

Privileges for Master/Detail Datasheets

Like standard datasheets, access to records displayed using master/detail datasheets is controlled by family-level security privileges. But because a master/detail datasheet displays records belonging to two entity families that are related to one another through a relationship family, the security considerations for master-detail datasheets are somewhat more complex. Specifically:

- To access records in a master/detail datasheet, at least View privileges are required on the master family. Even if users have privileges on the detail family, without privileges on the master family, they will not be able to access records that are displayed in master/detail datasheets.
- To view existing detail records in a master/detail datasheet, users must have View privileges on the detail family and the relationship family that relates the master family to the detail family.
- To edit existing detail records in a master/detail datasheet, users must have View and Update privileges on the detail family.
- To create new detail records in a master/detail datasheet, users must have View, Insert, and Update privileges on the detail family and the relationship family that relates the master family to the detail family.
- To unlink detail records in a master/detail datasheet, users must have Delete privileges on the relationship family that relates the master family to the detail family.

In addition to family-level privileges, the ability to manage records in master/detail datasheets is controlled by datasheet-level privileges. You can define datasheet-level privileges in the **Datasheet Builder** page, which appears when you create a master/detail datasheet.

The following datasheet-level permissions are available and control users' ability to manage detail records in a master/detail datasheet:

- Allow for Deletion: Determines whether users will be allowed to delete detail records.

  ◦ When this check box is selected, users with Delete privileges on the detail family and the relationship family that relates the detail family to the master family, will be allowed to delete detail records.
  ◦ When this check box is cleared, users with Delete privileges on the detail family will not be allowed to delete detail records.
  ◦ Regardless of whether this check box is selected or cleared, users without Delete privileges on the detail family will not be allowed to delete detail records.
- Allow for Insertion: Determines whether users will be allowed to create new detail records.

  ◦ When this check box is selected, users with Insert privileges on the detail family and the relationship family that relates the detail family to the master family, will be allowed to create detail records.
  ◦ When this check box is cleared, users with Insert privileges on the detail family will not be allowed to create detail records.
  ◦ Regardless of whether this check box is selected or cleared, users without Insert privileges on the detail family will not be allowed to create detail records.
- Allow for Editing: Determines whether users will be allowed to modify detail records.

  ◦ When this check box is selected, users with Update privileges on the detail family will be allowed to modify detail records.
  ◦ When this check box is cleared, users with Update privileges on the detail family will not be allowed to modify detail records.

- Regardless of whether this check box is selected or cleared, users without Update privileges on the detail family will not be allowed to modify detail records.
- Allow for Unlinking: Determines whether users will be allowed to unlink existing detail records from the master record.
    - When this check box is selected, users will be allowed to unlink detail records from the master record if they have Delete privileges on the relationship family that relates the detail family to the master family.
    - When this check box is cleared, users will not be allowed to unlink detail records from the master record even if they have Delete privileges on the relationship family that relates the detail family to the master family.
    - Regardless of whether this check box is selected or cleared, users without Delete privileges on the relationship family that relates the detail family to the master family will not be allowed to unlink detail records from the master record.

Custom-Layout Datasheets

A custom-layout datasheet is a form-based datasheet whose layout can be configured via APM. Unlike standard datasheets, custom-layout datasheets provide more flexibility in the layout of fields. For example, they can contain grouped fields, fields that appear side-by-side, and so on.

The following image shows a custom-layout datasheet that is configured in the baseline ASI module for the Maintenance Item family.

About the Text Editor

The text editor is available in various text fields throughout APM. You can use the text editor to enter text into a desired field and then use the Spell Check feature to locate and correct misspelled words within the text. The text editor is used to enter large amounts of text, such as descriptions, into text fields.

The text editor is available only for some fields. The ![button] button appears next to the fields for which the text editor is available. Select ![button] to access the text editor for a text field. The name of the field from which the text editor is accessed appears in the title bar of the text editor window.

Note: When using the bulk data form, the ![button] button appears when you select a text field.

If rich text formatting is enabled for a field, a toolbar appears in the field and in the text editor. You can use the tools to apply a range of formatting settings to the text, including the font size, color, bold, underline, and so on. You can also insert a hyperlink in the text.

Details

To use the text editor:

1. In a datasheet, select ![button] in the field whose text you want to modify.
   The **Text Editor** window appears.
2. Enter text in the text box.
3. Select **Done**.
   The text editor closes, and the text that you entered appears in the field from which you accessed the text editor.
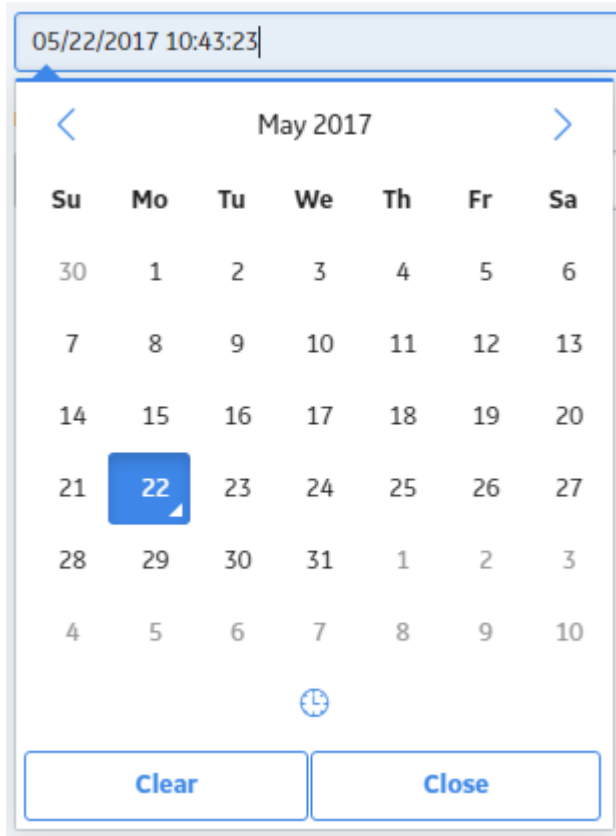
About the Calendar Feature

The Calendar feature appears throughout APM and provides the ability to select a date and time. In most cases, the Calendar feature appears in date fields on datasheets. The Calendar feature is not available, however, in all fields that store date and time values. There are three possible configurations for the Calendar feature:
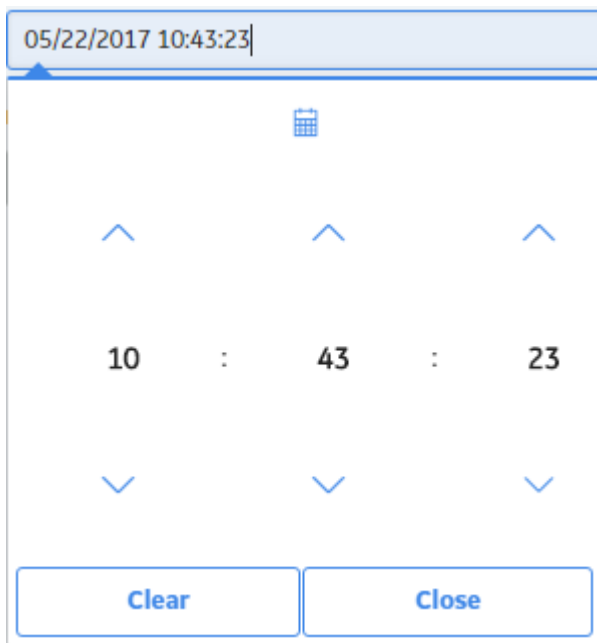
- Date and time
- Date only
- Time only

Date and Time

When you select a date field that has the date and time feature enabled, the ![button] button will appear. When you select the button, the calendar will appear, as shown in the following image:

05/22/2017 10:43:23|

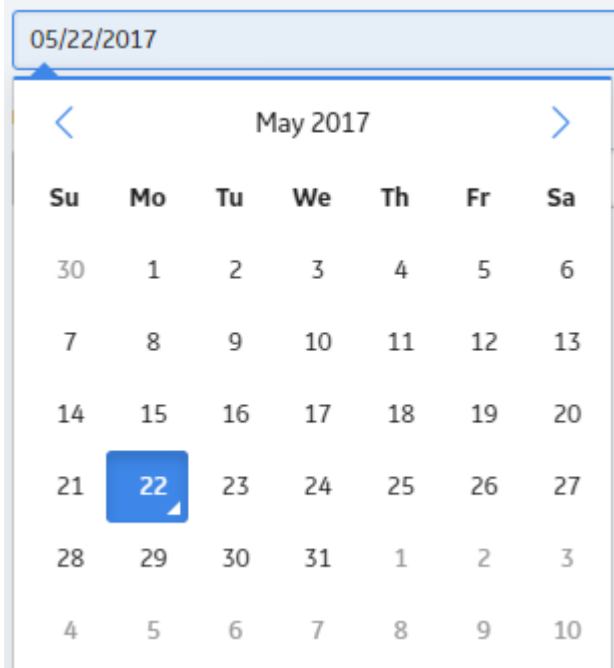|	May 2017	
Su	Mo	Tu	We	Th	Fr	Sa
30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	**22**	23	24	25	26	27
28	29	30	31	1	2	3
4	5	6	7	8	9	10

Clear   Close

When you select ⏱, the time picker will appear. Depending on your settings, the time picker may or may not have seconds enabled, as shown in the following image:

05/22/2017 10:43:23|

🗓

∧   ∧   ∧

10   :   43   :   23

∨   ∨   ∨

Clear   Close

When you select 🗓, the calendar will appear again.

Date Only

When you select a date field that has only the date picker enabled, the 🔲 button will appear. When you select the button, the calendar will appear, as shown in the following image:

05/22/2017						
‹		May 2017				›
Su	Mo	Tu	We	Th	Fr	Sa
30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3
4	5	6	7	8	9	10

Time Only

When you select a date field that has only the time picker enabled, the 🕐 button will appear. When you select the button, the time picker will appear. Depending on your settings, the time picker may or may not have seconds enabled, as shown in the following image:

05/22/2017 10:43:23

🗓

∧   ∧   ∧

10   :   43   :   23

∨   ∨   ∨

Clear	Close
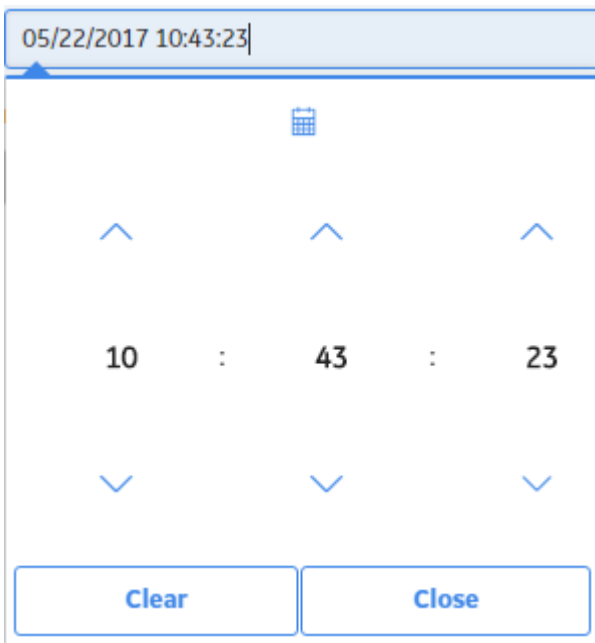
Access the Datasheet Builder

Procedure

1. Access the Family Management page.
2. In the left pane, in the **Entity** section, select the entity whose datasheet you want to configure.
   The workspace for the selected entity appears.
3. In the workspace, select the **Datasheets** tabs.
4. Select **Manage Datasheets**.
   The **Datasheet Builder** page appears.

Create a Datasheet

About This Task

When creating a datasheet in Configuration Manager, you can create the following types of datasheets:

- Master/Detail Datasheet
- Custom Datasheet

Procedure

- Create a Master/Detail Datasheet:

   1. Access the Datasheet Builder for the master family for which you want to create a datasheet.
   2. Select ![icon], and then select **Master/Detail datasheet**.
      The **Create New Datasheet** window appears.
   3. Enter a caption, default ID, and a description for the new datasheet, and then select **OK**.

      Note: If you want your datasheet to be the default datasheet for this family, select the **Default** check box.

      The **Datasheet Builder** page appears.
   4. Select the master family datasheet, detail family, detail family datasheet, and the relationship family to be shown in the datasheet, using the respective drop-down list boxes
   5. Select the check boxes for any datasheet-level permissions that you want to make available for the detail family records displayed in the datasheet.
   6. Select **Save**.
      The Master/Detail datasheet is created.

- Create a Custom Datasheet:

   1. Access the Datasheet Builder for the family for which you want to create a datasheet.
   2. Select ![icon], and then select **Custom datasheet**.
      The **Create New Datasheet** window appears.
   3. Enter a caption, default ID, and description for the new datasheet, and then select **OK**.

      Note: If you want your datasheet to be the default datasheet for this family, then select the **Default** check box.

   4. In the datasheet, select ![icon].

      The **Datasheet Builder** workspace appears.
   5. Select **Custom Layout** or **Tabular Layout** depending on your preference.
   6. As needed, enter values in the available fields.

7. Select **Save**.
    The Custom datasheet is created.

Next Steps

- Add fields to a datasheet.
- Add a section to a datasheet.

Modify a Datasheet

Procedure

1. Access the **Datasheet Builder** page for the family containing the datasheet that you want to modify.

2. Next to the **Datasheet Caption** label, select ▶, and then select the datasheet that you want to modify.
    The selected datasheet appears.

3. Select ⓘ.
    The **Datasheet Information** window appears.

4. As needed, modify the fields in the **Datasheet Information** window, and then select **Update**.
    The datasheet is modified.

    Note: The modified details of the datasheet will be available for you in Family Management, whereas to access the datasheet from other modules, you must log out and log in to APM. For other users who are being logged in to APM, the modified details of the datasheet will be available only when they log in to the application again.

Designate a Datasheet as the Default Datasheet

The default datasheet is the datasheet that is used by default when a user opens a record belonging to a given family in the Record Manager. A user can select a datasheet other than the default datasheet after the record has been opened. In addition, via the URL, you can specify that a datasheet other than the default datasheet be used. Because the default datasheet will be used unless a different datasheet is selected, the datasheet that you designate as the default datasheet the one that will be most meaningful to most users.

You can designate a datasheet as the default datasheet when you create the datasheet. After you set a datasheet as the default, you can change which datasheet for a given family, is designated as the default.

Before You Begin

- If another datasheet currently has the default designation, you must clear the Default check box for that datasheet before you can designate another datasheet as default.

Procedure

Modify the datasheet that you want to designate as the default datasheet, and ensure that the **Default** check box is selected before you select **Update**.

Results

The datasheet is designated as the default datasheet.

Hide a Datasheet

This topic describes how to hide a datasheet belonging to a family that you do not want to appear for the corresponding records.

Procedure

1. Access the **Datasheet Builder** page for the family containing the datasheet that you want to hide.

2. Next to the **Datasheet Caption** label, select ▶, and then select the datasheet that you want to hide.
   The selected datasheet appears.

3. Select 🛈.
   The **Datasheet Information** window appears.

4. Select the **Hide** check box.

   Note: You cannot hide a datasheet that is marked as default. If you want to hide a default datasheet, in the **Datasheet Information** window, clear the **Default** check box, and then select the **Hide** check box.

5. Select **Update**.
   The datasheet is saved and is not displayed for any record corresponding to the family.

Delete a Datasheet

Procedure

1. Access the **Datasheet Builder** page for the family containing the datasheet that you want to delete.

2. Next to the **Datasheet Caption** label, select ▶, and then select the datasheet that you want to delete.
   The selected datasheet appears.

3. Select 🗑.
   The **Alert** window appears.

4. Select **Yes**.
   The datasheet is deleted.

   Note: The deleted datasheet will immediately become unavailable to all users. If you are currently accessing a record using that datasheet, you must reopen the record and select a different datasheet.

Add a Section to a Datasheet

Procedure

1. Access the **Datasheet Builder** page.

2. Next to the **Datasheet Caption** label, select ▶, and then select the datasheet to which you want to add a section.
   The selected datasheet appears.

3. Select ⊟₊.
   A new section appears in the datasheet, displaying the caption **new section**.

4. Select the caption **new section** to modify the name of the new section.
   The workspace for the new section appears.

5. In the workspace, select a custom or tabular layout.
6. Select **Save**.
   The new section is saved on the datasheet.

   Note: The newly created section will be available for you in Family Management, whereas to access the section from other modules, you must log out and log in to APM. For other users who are being logged in to APM, the created section will be available only when they log in to the application again.

Rename a Datasheet Section, Column Caption, Field Group, or Field

Procedure

1. Access the **Datasheet Builder** page.
2. Next to the **Datasheet Caption** label, select ▶, and then select the datasheet whose section or field you want to rename.
   The selected datasheet appears.
3. Select the section name, column caption, field group, or field name that you want to modify, and then enter the new name.
4. Select **Save**.
   The section column caption, field group, or field is renamed.

Define Localized Labels

Procedure

1. Access the Datasheet Builder page.
2. Next to the **Datasheet Caption** label, select ▶, and then select the datasheet whose section or field you want to rename.
   The selected datasheet appears.
3. Select 🌐.
   The **Localized Current Value** window appears.
4. Enter the localized labels for each language which are available in the APM.
5. Select **Save**.
   The localized labels are saved and displayed as per your language preference.

Delete a Datasheet Section

About This Task

Note: If there is only one section in the datasheet, you cannot delete this section.

Procedure

1. Access the **Datasheet Builder** page.
2. Next to the **Datasheet Caption** label, select ▶, select the datasheet that you want to modify.
   The selected datasheet appears.
3. In the datasheet section that you want to delete, select ✕.

   The section is deleted.
4. Select **Save**.

Reset the Current Datasheet

About This Task

If you have made changes to the datasheet layout; however, have not yet saved the changes, then you can reset the datasheet to the previously saved layout.

Procedure

1. In the **Datasheet Builder** page, for the datasheet that you want to reset, select ↺.
   The **You have unsaved changes** window appears.
2. Select **OK**.

Results

The datasheet layout including all fields and sections is reverted to the previously saved layout.

Manage Custom Form Datasheet

Add Fields to a Datasheet

Procedure

1. Access the Datasheet Builder.

2. Next to the **Datasheet Caption** label, select ▶, select the datasheet to which you want to add fields.
   The datasheet appears in the **Datasheet Builder** workspace.
3. In the **Available Items** pane, select the field that you want and drag it into the **Datasheet Builder** workspace.
   The field is added to that datasheet.
4. Select **Save**.
   The datasheet is saved.

Add Fields to a Datasheet Section

Procedure

1. Access the **Datasheet Builder** page.

2. Next to the **Datasheet Caption** label, select ▶, select the datasheet to which you want to add a section.
   The datasheet appears in the **Datasheet Builder** page.
3. Select the datasheet section to which you want to add fields.
4. In the **Available Items** pane, select the field that you want and drag it into the appropriate section.
   The field is added to that section.
5. Select **Save**.
   The datasheet is saved.

Modify the Datasheet Caption for a Field

Procedure

1. Access the **Datasheet Builder** page.

2. In the upper-right corner of the page, select ▶ , and then select the section for which you want to modify the caption.
   The datasheet appears in the **Datasheet Builder** page.

3. Select ⓘ .
   The **Datasheet Information** window appears.

4. As needed, modify the value in the **Caption** box.

5. Select **Update**.
   The datasheet caption for the field is modified.

Remove a Field from a Datasheet Section

Procedure

1. Access the **Datasheet Builder** page.

2. Next to the **Datasheet Caption** label, select ▶ , and then select the datasheet you want to modify.
   The datasheet appears in the **Datasheet Builder** page.

3. In the **Available Items** pane, select the field that you want to remove.

4. Select ⫫ .
   The datasheet section is removed.

5. Select **Save**.

   Note: The removed family will no longer be available for you in Family Management, whereas to ensure that the field is not accessible from other modules, you must log out and log in to APM. For other users who are being logged in to APM, the deleted field will not be available only when they log in to the application again.

Rearrange Rows

Procedure

1. Access the datasheet for which you want to rearrange the rows.
2. Select and drag the items that you want to remove back to the **Available Items** pane, and then select and drag the items to the available rows as needed.
3. Select **Save**.
   The datasheet is saved reflecting your changes.

Modify an Item Label

Procedure

1. Access the datasheet that you want to modify.
2. In the workspace, select the label that you want to modify, and then enter your changes directly.
3. Select **Save**.

The item label is modified.

Custom Layout

Resize a Field

About This Task

This topic assumes you have added a new Custom Layout section to your datasheet.

Procedure

- Configure a Custom Layout datasheet field in a multi-column configuration:

    1. From the **Available Items** pane, add a field to your datasheet section.

    2. In the datasheet workspace, select the field that you want to resize, and then select ≣₊.
       The field is resized.

       Note: You can configure the Datasheets to accommodate up to four columns in the Custom Layout.

- Change a Custom Layout datasheet field configuration from multi-column to single column:

    1. Select the field that you want to resize.

       Note: If you have more than one field on the same row, you must first select and drag all the fields back to the **Available Items** pane, except the field that you want to resize.

    2. Select ≣⁄.
       The field is resized to take up its entire row (i.e., a single-column configuration).

Create a Group of Fields

Having groups of fields on a datasheet is a good way to keep similar items together under a common heading. This topic describes how to create a group of fields on a custom datasheet.

Procedure

1. Add a new section to a datasheet, and select the custom layout.
2. Add fields that you want to group to your new section.
3. Select ⬚, select the items in your datasheet that you want to group, and then select ⧉.
   The items are grouped together with a single shared heading.

   Note: You can edit the heading for the group by selecting the heading and entering your preferred heading name.

Add a Field to a Group of Fields

Procedure

1. Open the datasheet containing the group that you want to modify.
2. In the **Available Items** pane, select the item that you want to add to the group, and then drag it into the group.
   The item is added to the group.

Remove a Field from a Group

Procedure

1. Open the datasheet containing the field group that you want to modify.
2. Select the item that you want to remove from the group and drag it to the **Available Items** pane.
The item is removed from the group.

Ungroup Fields

Procedure

1. Open the datasheet containing the group you want to ungroup.

2. Select the group heading, and then select ⬚.
The items are ungrouped on the datasheet.

Tabular Layout

Create Tabular Layout Section in a Datasheet

Procedure

1. Add a section to a Custom Form datasheet.
2. Name the Datasheet section.
3. Select ▤.
The tabular layout table is added to the datasheet.
4. Select **Save**.

Results

- The structure for the tabular layout datasheet section is now in place.

Next Steps

- Add fields to a datasheet section.

Add or Remove Columns in a Tabular Layout Section

Columns can be added or removed in a tabular layout.

Procedure

- Add a column:

  1. Create a datasheet section with tabular layout.

  2. In the blank workspace for the section you created, select ⊞.
  A column is added to the datasheet table structure.

     Note: You may add up to four columns of fields to a tabular layout datasheet. The first column always displays row labels.

3. Select **Save**.
- Delete a column:

    1. In the workspace for the section, select the column that you want to delete.

    2. Select ≡⁄.
    The column is removed from the datasheet table structure.

    3. Select **Save**.

Add or Delete Rows in a Tabular Layout Section

About This Task

Rows can be added or deleted in a tabular layout section.

Procedure

- Add a row:

    1. Create a datasheet section with tabular layout.

    2. In the blank workspace for the section you created, select ≡+.
    A row is added to the datasheet table structure.

    3. Select **Save**.
- Delete a row:

    1. In the workspace for the section, select the row that you want to delete.

    2. Select ≡⁄.
    The row is removed from the datasheet table structure.

    3. Select **Save**.

Add or Delete Fields in a Tabular Layout Section

About This Task

Fields can be added or deleted in a tabular layout section.

Procedure

- Add fields in a datasheet:

    1. On the **Datasheet Builder** page for the datasheet to which you want to add fields, add the columns and rows that you need for your datasheet.

    2. In the **Available Items** pane, drag and drop the fields you want to add to the row and column where you want them.
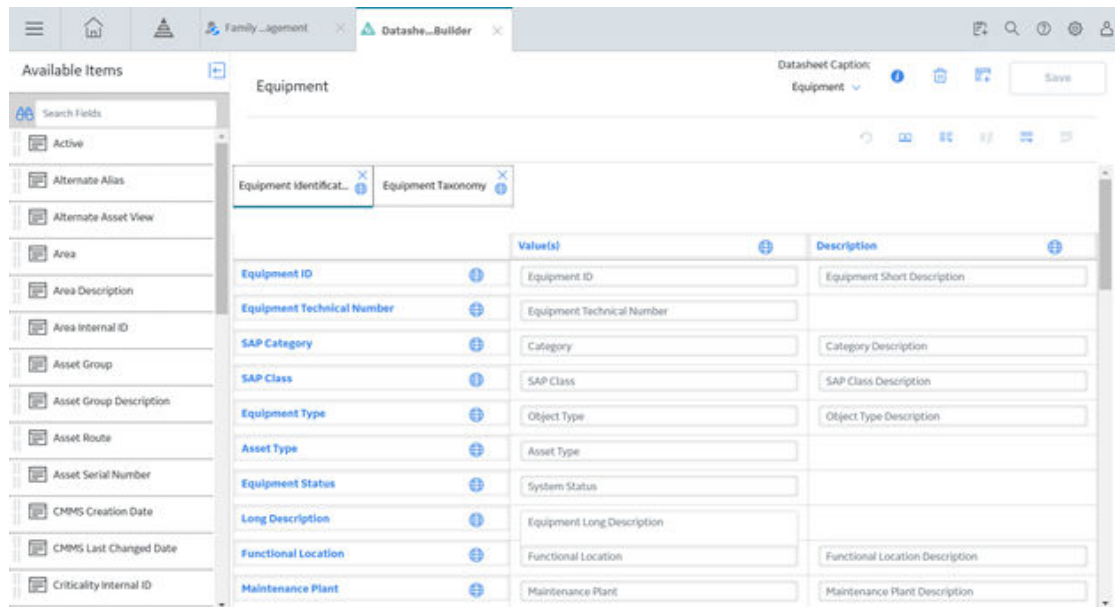
- Delete fields from a datasheet:

    1. On the **Datasheet Builder** page for the datasheet to which you want to delete fields, drag and drop fields from the datasheet back to the **Available Items** pane as needed.

Chapter

5

Offline Forms

Topics:

About Offline Forms

APM customers can access data when executing product workflows offline. You can create, read, update, and delete APM product data in a location without connecting to a server. Using Offline Forms, you can now modify and define an offline data collection UI for APM families.

Offline Forms can be accessed through Configuration Manager and the UI can be specifically configured for offline display. More than one offline form can be configured for a family. This form creation is available only for Entity Families.

To configure a form, you can select a field from a list for the family and drag it onto a grid based canvas. Fields can be setup to occupy an entire row or you can have two fields in a row. The configuration will need to be exported and delivered as part of the Family content delivery.

The following field behaviors are supported in offline forms:

- Required
- Disabled
- Default
- Masked Field
- Picklist
- Validate (depends on the input type)

Access the Offline Form Builder

Procedure

1. Access the Family Management page.
2. On the **Family Management** page, in the left pane, select **Entity**, and then select the entity whose datasheet you want to configure.
   The workspace for the selected entity family appears.
3. In the workspace, select the **Datasheets** tab, and then select **Manage Offline Forms**.
   The **Create New Form** window appears.

   Note: If there is an existing offline form for the entity, the offline form for that entity appears. If there is more than one offline form, the default offline form for that entity appears.

Create an Offline Form

Procedure

1. Access the Offline Form Builder.
2. Enter values in the **Caption**, **Default ID**, and a **Description** boxes, and then select **OK**.

   Note: If you want your offline form to be the default offline form for this family, then select the **Default** check box.

   The offline form is created, and the list of available fields that can be added to the form appears.
3. In the **Available Fields** pane, select the field that you want and drag it to the workspace for that offline form.
   The field is added to the workspace for that offline form.

4. If you want to rearrange the fields for the offline form, then select and drag the items that you want to remove back to the **Available Fields** pane, and then select and drag the fields back to the workspace as needed.
5. If you want to delete the fields in the offline form, drag and drop fields from the datasheet back to the **Available Fields** pane as needed.
6. Select 💾.
   The offline form is saved.

Access or Modify an Offline Form

Procedure

1. Access the Offline Form Builder.

   Note: If there is an existing offline form for the entity, the offline form for that entity appears. If there is more than one Offline form, the default offline form for that entity appears.

2. To select an offline form, then in the upper-right corner of the workspace, select ▶, and then select the offline form that you want to edit.
   The workspace for the offline form appears, displaying the fields of the offline form.

3. For information on the selected offline form, select ⓘ.
   The **Form Information** window appears.

4. As needed, enter or modify the values in the **Caption** and **Description** boxes on the **Form Information** window.

5. Select **Update**.
   The Offline form is saved.

Add an Offline Form

Procedure

1. Create an offline form.

2. Select ➕.
   The **Offline Form Builder** appears.

3. Enter values in the **Caption**, **Default ID**, and **Description** boxes, and then select **OK**.

   Note: If you want your offline form to be the default offline form for this family, then select the **Default** check box.

   The offline form is created, and the list of available fields that can be added to the form appears.

4. In the **Available Fields** pane, select the field that you want, and then drag it to the workspace for that offline form.
   The field is added to the workspace for that offline form.

5. If you want to rearrange the fields for the offline form, then select and drag the items that you want to remove back to the **Available Fields** pane, and then select and drag the fields back to the workspace as needed.

6. If you want to delete the fields in the offline form, then drag and drop fields from the datasheet back to the **Available Fields** pane as needed.

7. Select 💾.

The offline form is saved.

Add or Delete Columns in Offline Forms

Columns can be added or deleted in offline forms.

Procedure

- Add columns:

    1. Access or Edit an offline form.
    2. Select the column to the right of which you want to add the additional column.
    3. Select �横.
       An additional column is added to the offline form.

       Note: You may add up to four columns to an offline form.

    4. Select 💾.
       The offline form is saved.

- Delete columns:

    1. Select the column that you want to delete.
    2. Select ⎗.
       The column is deleted.
    3. Select 💾.
       The offline form is saved.

Delete Fields in Offline Forms

Procedure

1. In the **Offline Datasheet Builder** workspace for the form to which you want to delete fields, add the columns and rows that you need for your datasheet.
2. Drag and drop fields from the datasheet back to the **Available Items** pane as needed.

Change the Default Offline Form for the Family

Procedure

1. Access the Family Management page.
2. On the **Family Management** page, in the left pane, select **Entity**, and then select the entity whose datasheet you want to configure.

   The workspace for the selected entity family appears.

3. In the workspace, select **Datasheets**, and then select **Manage Offline Forms**.
   The default offline form appears.

   Note: If there is an existing offline form for the entity, the offline form for that entity appears. If there is more than one offline form, the default offline form for that entity appears.

4. In the upper-right corner of the offline form, select ⓘ.

The **Form Information** window appears.

5. Clear the **Default** checkbox, and then select the **Update** button.
   The offline form is no longer the default form.

6. In the upper-right corner of the offline form, select ▶ , and then select the Offline form that you want to set as default.
   The offline form for the selected Entity family appears.

7. In the upper-right corner of the offline form, select 🛈.
   The **Form Information** window appears.

8. Select the **Default** checkbox, and then select **Update**.
   This offline form is now the default form.

Chapter

6

Family Reports

Topics:

About Associating Reports with Families

Each entity family can be associated with one or more reports, which will be available for selection when a user chooses to print a record in that family in the Record Manager. The main benefit of using family reports is the ability to display the record in a customized layout that is designed using a report.

Note: Before you can associate reports with families in your database, you must first create the reports, any necessary queries and save them in the Catalog.

While any report can be associated with a family, the intent is for administrative users to build reports based upon queries that contain an entity key prompt. When you open a record in the Record Manager, the entity key from the current record will be passed in to the query prompt, thereby limiting the report content to that of the current record.

Access the Family Report Section

About This Task

You can view the reports that are associated with a family on the **Family Report** page.

Procedure

1. Access the Family Management page.
2. In the left pane, select **Entity**.
   The associated family list appears.
3. Select the family to which you want to add a new report.
   The workspace for the selected family appears, displaying the available tabs. By default, the **Information** section appears.
4. At the top of the workspace, select **Family Reports**.
   The **Family Reports** section appears. On the **Family Reports** section, you can associate a family with a report or delete family reports.

Associate Reports with a Family

Before You Begin

- Make sure that the report that you want to associate with the family exists in the Catalog folder.

Procedure

1. Access the **Family Report** section.

2. In the **Family Reports** section, select $+$.
   The **Select Report to Link** window appears, where you can search for the report and associate the report to a family.

3. Specify the criteria to search for the report that you want to associate with the family:

   a) In the **Search for items named** box, enter the name of the report that you want to associate with the family.

   b) In the **In folders(s)** box, select ⸬ .

The **Catalog Folder Browser** window appears.

    c) Navigate to the folder that contains the report, select the folder, and then select **Done**.
The path of the folder appears in the **In folder(s)** box.

    d) In the **Of type** box, select the type of the report that you want to associate.

    e) If you want to search for the report in the sub folders, select **Include sub folders**.

    f) Select **Search**.
A list of the reports based on the search criteria appears in the **Results** section.

4. Select the report that you want to associate with the family, and then select **Open**.
The selected report appears in the **Family Reports** section.

5. Select 💾.
The report is associated with the family. If required, you can mark the report as default for the family.

Note:

- The first report that you associate with the family becomes the default report for the family.
- If there are multiple reports in the **Family Reports** section, the latest report appears first in the list of associated reports.

Designate a Report as the Default Report

About This Task

When a report is set as the default report for a family, that report will be selected automatically to print a record in the Record Manager. If required, you can change the selection.

Procedure

1. Access the **Family Reports** section.

2. In the row that contains the report, select the family report and then select the ✔ button appearing next to the **Default** box.
The selected report becomes the default report for that family.

Remove the Reports Linked to a Family

About This Task

Removing a report removes the association between the report and the family. It does not delete the report from the Catalog folder. When a report is associated with a family, it cannot be deleted from the Catalog. If you want to delete a report from the Catalog folder, you must first remove the report from the family.

Procedure

1. Access the **Family Report** section.

2. From the list of reports, select the report that you want to delete and select ✕ .
A confirmation dialog box appears, asking if you really want to remove the associated report.

3. Select **OK**.
The report is no longer associated with the family and is removed from the list of family reports.

Chapter

7

Relationship Definition

Topics:

About Relationship Definition Behavior

A relationship family corresponds to a database table that is used to relate two entity family tables. A relationship definition, for a given relationship family, is a rule that specifies which two entity families are related, which family is the predecessor, which family is the successor, and the cardinality of each. By setting up relationship definitions, you can define the various types and levels of connections that exist between entities.

For example, a piece of equipment might be related to items like:

- The location that contains it
- The people who inspect and maintain it
- The inspection and repair events performed on it
- The workflows in which it participates

After you have associated entity families with one another using relationship definitions, you can create business rules based on those relationships. In this way, individual entities, which are stored separately within the database can interact with, use information from, and can even be updated based on changes made to other, related entities.

You can set up and maintain relationship definitions via the Configuration Manager. When deciding how many relationships to create, remember that too many relationships can create unnecessary system overhead. Too few relationships, on the other hand, will prevent you from defining them specifically enough to be useful to the end user.

Each family can participate in numerous relationships. Consider that the Pressure Vessel family can be involved in the following relationships:

- An Equipment Contains Sub-Equipment relationship with the Shell family and the Nozzle family.
- An Equipment Connects to Equipment relationship with the Valve family.
- An Equipment Has Inspections and Equipment Has Repairs relationship with the Inspections and Repairs families.

About Creating Relationship Definition

Creating relationship definitions allow you to define, for a relationship family, which entity families are related to one another through that relationship.

Each relationship definition consists of the following elements:

- A relationship family.

  Note: The relationship family stores relationship definitions. For example, the Has Maintenance relationship family might store a relationship definition that relates the Pump family to the Work Order family.

- A predecessor entity family.
- A successor entity family.
- Cardinality, which specifies how many entities in the predecessor family can be linked to how many entities in the successor family.

While defining a relationship definition, make sure that they do not spread to subfamilies. In other words, you must create relationship definitions for each specific predecessor and successor family that you want to participate in the relationship. For example, if the Manufacturer family has two subfamilies, Chinese Manufacturer and Canadian Manufacturer, and you want to be able to link Chinese Manufacturer records and Canadian Manufacturer records to Equipment records, you must create a relationship definition for

both the Chinese Manufacturer family and the Canadian Manufacturer family. Defining a relationship for the Manufacturer family alone would not be sufficient.

After you create relationship definitions, you must make sure that you assign family-level privileges, such that the users have permission to access all the families involved in the relationship definition, including the relationship family. Granting permission to only some of the families in a relationship will grant a user only partial access to the records that are linked to one another through that relationship.

Note: You may want to avoid using inactive entity families in relationship definitions. Otherwise, when viewing a record in the Record Manager, and using the **All Possible Families** option, users will see ALL related families, including inactive families.

About Successors and Predecessors

Before creating a relationship definition, you must first decide which two families will participate in the relationship. Then, you must decide which family will be the predecessor and which will be the successor in the relationship.

In many cases, the predecessor is the single part of the relationship equation and the successor is the multiple part. For example, if the relationship is Has Failure, and you determine that a piece of equipment, such as a pump, has a failure, then the pump experiencing the failure is the predecessor because there is one pump, whereas the failure is the successor because a pump might have many failures.

Another way to look at predecessors and successors is to consider that the predecessor comes before the successor. For example, using this guideline, a piece of equipment could be the predecessor and a repair could be the successor because the equipment was in place before it was repaired.

Note: These are guidelines. APM will allow any type of setup that you feel best suits your needs.

About Cardinality

Cardinality for a particular relationship definition specifies how many links can be created between records of the predecessor and successor families. Consider an example where the Has Maintenance relationship relates the Axial Compressor family to the Work Order family. Within this relationship definition, the cardinality would specify how many Work Order records could be linked to a given Axial Compressor record, and vice versa.

The following list provides descriptions of the cardinality rules that can be defined for successors and predecessors. For the purposes of our examples, assume that the Axial Compressor family is the predecessor and the Work Order family is the successor in the Has Maintenance relationship.

- One To One: One and only one predecessor record can be linked to one and only one successor record. For example, one and only one Axial Compressor record can be linked to one and only one Work Order record. Axial Compressor A can be linked to Work Order 1, but Axial Compressor A cannot be linked to any other Work Orders.
- One To Many: One and only one predecessor record can be linked to many successor records. For example, one and only one Axial Compressor record can be linked to many Work Order records. Axial Compressor A can be linked to Work Order 1, Work Order 2, and Work Order 3, and so on.
- Many to One: Many predecessor records can be linked to one and only one successor record. For example, many Axial Compressor records can be linked to one and only one Work Order record. Axial Compressor A and Axial Compressor B could be linked to Work Order 1.
- Many To Many: Many predecessor records can be linked to many successor records. For example, many Axial Compressor records can be linked to many Work Order records. Axial Compressor A and Axial Compressor B can be linked to Work Order 1, and Axial Compressor A and Axial Compressor B can be linked to Work Order 2.

Depending on the entity families and the relationship family involved in the relationship definition, some cardinality options may not be logical for your implementation. Via the Configuration Manager, administrative users can configure the cardinality between entity families according to your company's workflow.

Based on the cardinality defined between entity families through a given relationship family, you will be limited to the number of links that you can create between records when working with the records in the APM. For example, if your system is configured such that a Work Order record can be linked to only one piece of equipment, such as a Pump, you could create a link between Pump 101 and Work Order 1, but you could not link Work Order 1 to any other equipment records. If you tried to do so, APM would generate an error. In this way, cardinality prevents you from creating relationships that should not exist.

Note: A given family can also act as the predecessor in one relationship and the successor in another. For example, the Equipment family is the successor in the Functional Location Has Equipment relationship and the successor in the Equipment Has Equipment relationship.

About Relationship Data

One thing to consider when configuring relationships is whether or not information about the relationship will need to be stored. If so, fields can be defined for that relationship family, and a datasheet can be configured. Each time records are linked via the APM, specific information about the link can be recorded in that datasheet.

For example, suppose a pipe is connected to a pump in your facility. You record various types of information for the pipe in a Pipe record and different information for the pump in a Pump record. But when you link the Pipe record to the Pump record, you need to store information specific to that connection, such as weld type and material.

Fields are defined at the relationship family level and are stored as columns in the relationship family table. Any relationship field that you define, therefore, will be available for any link between any predecessor and successor. So, you might need to create more specific relationship families if you plan to use relationship fields.

Note: When you store data about relationships, you increase the complexity of your system, which could potentially hinder the performance of the system.

Access the Relationship Definition Section

About This Task

You can use the **Relationship Definitions** section to manage all the relationship definitions for a given relationship family.

Procedure

1. Access the Family Management page.
2. In the left pane, select **Relationship**.
3. In the list of relationship families, select the relationship family for which you want to configure relationship definitions.
   The details of the relationship family appear in the workspace, in the **Information** section.
4. At the top of the workspace, select **Relationship Definition**.
   The **Relationship Definition** section appears, displaying a grid with three columns: **Predecessor(s)**, **Successor(s)**, and **Cardinality**.

Create a Relationship Definition

Procedure

1. Access the **Relationship Definition** section.
2. Select ╋ to add predecessor and successor families.
   The **Manage Relationship Definition** window appears.
3. In the **Predecessor(s)** box, select the predecessor family.
   The selected families appear in the **Predecessor(s)** box.

   Note: You can choose to include all the subfamilies of a family by selecting the **Apply to Predecessor Sub-Family** check box.
4. In the **Successor(s)** box, select the successor family.
   The selected families appear in the **Successor(s)** box.
5. Select **Add**.
   The **Manage Relationship Definition** window closes. The selected successor and predecessor families, and the cardinality appear in the **Relationship Definition** section.
6. Select 💾.
   A confirmation message appears, indicating that the relationship definition is created.

   Note: Modifying the cardinality of a relationship definition is not supported and may lead to data integrity being compromised.

Delete a Relationship Definition

Procedure

1. Access the **Relationship Definition** section.
2. Select the relationship definition that you want to delete.
   The **Manage Relationship Definition** window appears.
3. Select **Delete**.
   The **Manage Relationship Definition** window closes and the **Relationship Definition** section appears.
4. Select 💾.
   A confirmation message appears, indicating that the relationship definition is deleted.

Chapter

8

State Configuration

Topics:

About the State Configuration

State Configuration provides a way for APM users to indicate the status of a record and its associated information.

For example, the workflow for requesting maintenance work involves creating a Work Order record, assigning the record to the maintenance personnel, and then closing the record after the work is completed. In this case, it might be useful to show the status of the Work Order record as either Created, Assigned, or Closed.

You can use the Configuration Manager to define State Configuration for a family so that APM users can apply status to records in those families. A family's state configuration consists of the combination of:

- **States**: These identify the status of a record. For example: Proposed, Rejected, Assigned, In Progress and so on.
- **Operations**: These define the available transition between the states. Operations help users to determine what steps should be taken next. For example: Reject, Approve, Assign and so on.

  In most cases, the same user will not be performing all operations. Instead, one user will be responsible for one operation or a small set of operations, while another user will be responsible for another small set of operations. In this way, the operations guide users to perform the tasks for which they are responsible while prohibiting them from performing tasks that they should not participate in.
- **Rules:** These dictate a record's available states and the transitions that change the state.

You will define a family's state configuration by accessing the **State Configuration** section from the top navigation bar. You can use the **State Configuration** workspace to define a state and modify the workflow between the states.

APM provides a baseline State Configuration for several APM families. You can define a State Configurations for any families of your choice. As you define the State Configuration for a family, keep in mind the workflow that you want users to follow. Then, create states and operations that facilitate that workflow and decrease the possibility of user error.

After State Configuration is defined for a family, you can also assign Security Users to State Configuration Roles and states to limit the users that are allowed to change a record's state.

Baseline State Configurations

APM provides a baseline State Configuration for several families. If required, you can extend a baseline State Configuration by adding new states and operations. You cannot, however, remove baseline states and operations that are flagged as **Reserved** in the **Properties** window of the state or operations. This limitation ensures that any baseline functionality that you can perform in the APM using states and operations does not get modified or removed.

Note: If an operation is reserved, the users will not be able to select that operation from the datasheet in the Record Manager.

You can, however, modify or remove any baseline states or operations that are not flagged as Reserved.

Example of State Configuration

Consider the following example of states and operations that you might configure for the Work Order family.

Note that in the following image, a square represents a state, and a line represents an operation. The square at the beginning of an arrow represents a predecessor state, and a square to which the arrow points represents a successor state.
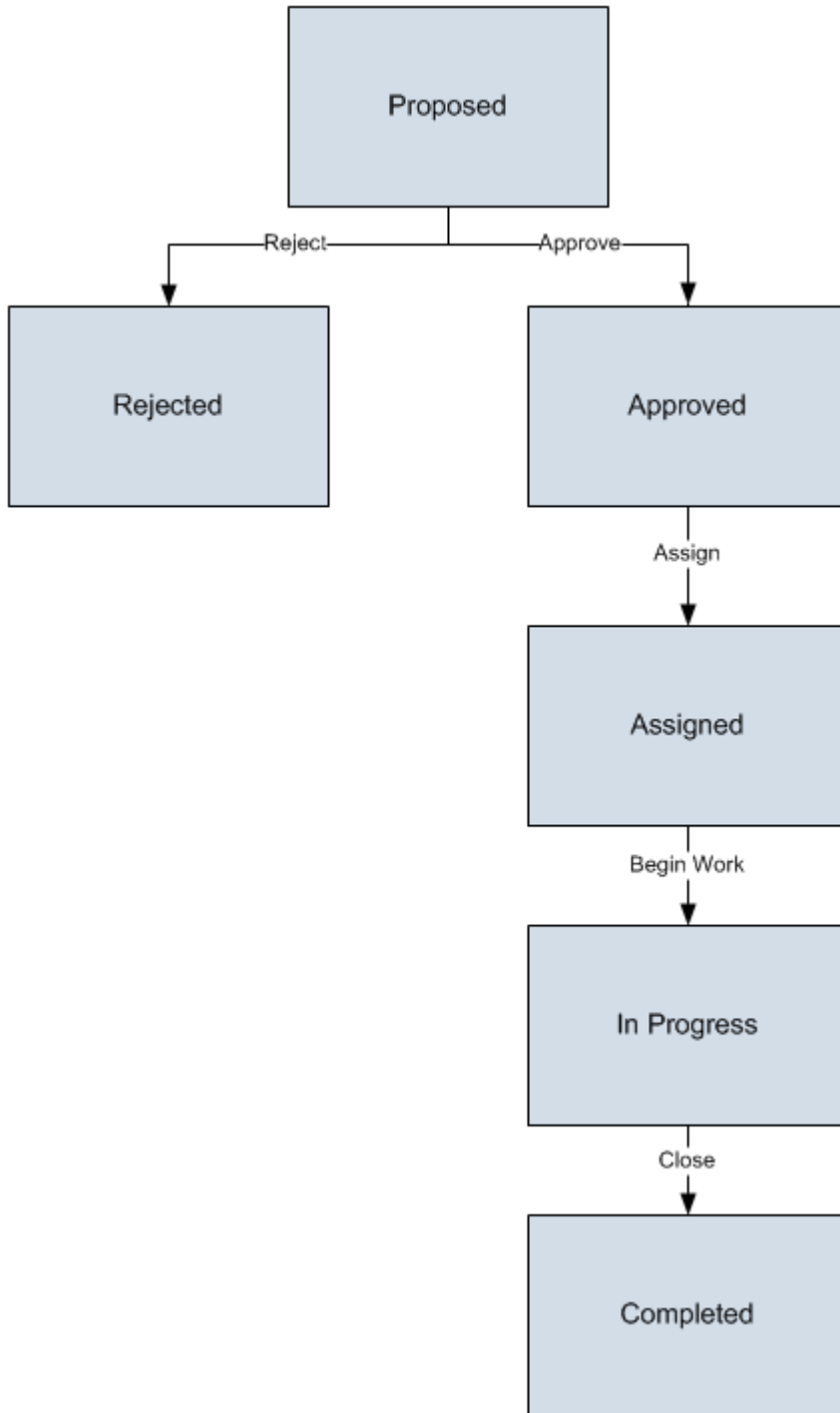
From this diagram, you can see that a Work Order record can be set to any of the following states:

- Proposed
- Rejected
- Approved
- Assigned
- In Progress
- Completed

The operations that cause a record to change from one state to another are:

- **Reject**: Changes the state from Proposed to Rejected.
- **Approve**: Changes the state from Proposed to Approved.
- **Assign**: Changes the state from Approved to Assigned.
- **Begin Work**: Changes the state from Assigned to In Progress.
- **Close**: Changes the state from In Progress to Completed.

The states are intended to provide a visual indicator of the status of a certain record and its associated information. In addition, operations help users determine what steps should be taken next. In most cases, the same user will not be performing all operations. Instead, one user will be responsible for one operation or a small set of operations, while another user will be responsible for another small set of operations. In this way, operations help guide users to perform the tasks for which they are responsible while prohibiting them from performing tasks that they should not participate in.

For example, based on the diagram shown above, for a Work Order record that is Approved, the only available operation to a APM user would be Assign. This operation indicates that the record has been approved and is ready to be assigned to the required user. Likewise, an Assigned record is ready to be implemented, which the operation Begin Work indicates. It is unlikely that the user assigning the work order would be the same who does the work.

As you define the State Configuration for a family, keep in mind the workflow that you want users to follow. Then, create states and operations that facilitate that workflow and decrease the possibility of user error.

About Enabling or Disabling the State Functionality

Note: To define a State Configuration for a family, it depends on the level where you want to define it.

Procedure

- To define the state configuration, at any level, you need to select the **Enable State Functionality** button. On selecting this button:
  Three new fields will be created automatically if you are enabling the State Configuration for the first time for the selected family: State, Owner, and Last Entered Date. You can add these fields to any datasheet if you want APM users to be able to see the values in places such as the Record Manager.

  Note: If you add the fields to a datasheet, we recommend that you modify the datasheet captions. If you do not modify the captions, the default captions will be MI_SM_STATE_ID_C, MI_SM_STATE_OWNER_ID_C, and MI_SM_STATE_ENTERED_D.

  ◦ If you are defining State Configuration at parent family level, you can define the states and the operations.
  ◦ If you are defining the State Configuration at the subfamily level, you can:

    ◦ Inherit the configuration defined at the parent family level and make no changes to the defined state configuration.
      For this, you can select the **Use Parent's Configuration** check box. The state Configuration defined for the parent will appear disabled on the workspace and you cannot modify the defined State Configuration.
    ◦ Inherit the configuraation defined at the parent family level and update the defined State Configuration.
      To do this, you can select the **Enable State Functionality** button. The copy of the State Configuration defined for the parent family will appear on the workspace and you can add,

delete or modify the State Configuration copy. You cannot, however, modify the **ID** for the copied states and operations.

- To disable the state configuration for a family or subfamily, select the **Disable State Functionality** button. On selecting this button:

    ◦ All the record of a family will be moved to null state. The state assignments for all records of this family will also be cleared. When you enable it again by selecting the **Enable State Functionality** button, the records will start from the initial state.

    ◦ If the state configuration is defined for a family and you had selected the **Disable State Functionality** button, then if you select the **Enable State Functionality** button again, the last saved State Configuration will appear in the workspace.

State Configuration Workflow

The State Configuration workflow consist of defining State Configuration for a family and ensuring that the Security Users can transition records belonging to that family. You can define the state configuration workflow by using Configuration Manager and transition from one state to another state.

The following table outlines the complete State Configuration workflow.

Steps	Task	Location
1	Identify or create the family for which you want to define the State Configuration.	Configuration Manager
2	Create State Configuration for families.	Configuration Manager
3	If desired, for the families for which you defined State Configuration, assign Security Roles to states.	Configuration Manager
4	If you assigned State Configuration Roles to states, assign Security Users to those State Configuration Roles.	Security Manager
5	If you selected the **Require a specific user** check box to be assigned to any state, assign Security Users to those states.	Configuration Manager

Actions That are Required in Configuration Manager

The following table explains the actions that you can perform in the Configuration Manager regarding Security Roles. Specifically, it lists the following actions, their results, and an example of each action and result:

- Assigning Security Role to Security Groups.

Action	Example	Result
You assign a Security Role to a Security Group.	You assign the State Configuration Role Asset Strategy Reviewers to the Security Group MI ASM Administrators.	Members of that Security Group can assign users to and from that Security Role via the Security Manager. Example Result: Members of the MI ASM Administrator Security Group can assign users to and from the Asset Strategy Reviewers Security Role via the Security Manager.

- Assigning State Configuration Roles to predecessor states with the **Require a specific user to be assigned to a state** check box selected.

Action	Example	Result
You assign a Security Role to a predecessor state. -and- You select the **Require a specific user to be assigned to a state** check box.	For the Asset Strategy family, you assign the Security Role Asset Strategy Reviewers to the predecessor state Pending Review. -and- You select the **Require a specific user to be assigned to a state** check box.	Example Result: Only the Security User who is assigned to the Pending Review state for a particular Asset Strategy record will be allowed to transition the Asset Strategy record out of the Pending Review state.

- Assigning State Configuration Roles to Predecessor States with the **Require a specific user to be assigned to a state** check box cleared.

Action	Example	Result
You assign a Security Role to a predecessor state. -and- You clear the **Require a specific user to be assigned to a state** check box.	For the Asset Strategy family, you assign the Security Role Asset Strategy Reviewers to the predecessor state Pending Review. -and- You clear the **Require a specific user to be assigned to a state** check box.	Any Security User who is assigned to that State Configuration Role can transition a record out of that state. Example Result: Any Security User who is assigned to the Asset Strategy Reviewers Security Role can transition an Asset Strategy record out of the Pending Review state.

- Assigning Security Role to Successor States with the **Require a specific user to be assigned to a state** check box selected.

Action	Example	Result
You assign a State Configuration Role to a successor state. -and- You clear the **Require a specific user to be assigned to a state** check box.	For the Asset Strategy family, you assign the Security Role Asset Strategy Reviewers to the successor state Active. -and- You select the **Require a specific user to be assigned to a state** check box.	Any Security User can transition a record to that state, assuming that: ◦ That user meets the criteria defined by the predecessor state selections. ◦ The state is assigned to a Security User who is assigned to that Security Role. Example Result: A Security User can transition an Asset Strategy record to the Active state if: ◦ The user meets the criteria defined by the predecessor state. ◦ The Active state is assigned to any Security User who is assigned to the Asset Strategy Reviewers Security Role.

- Assigning State Configuration Roles to Successor States with the **Require a specific user to be assigned to a state** check box cleared.

Action	Example	Result
You assign a Security Role to a successor state. -and- You clear the **Require a specific user to be assigned to a state** check box.	For the Asset Strategy family, you assign the State Configuration Role Asset Strategy Reviewers to the successor state Active. -and- You clear the **Require a specific user to be assigned to a state** check box.	Any Security User can transition a record to that state, assuming that the user meets the criteria defined by the predecessor state selections. In other words, because the check box is cleared, the Security Role that is assigned to the successor state is ignored. Example Result: Any Security User that meets the criteria defined by the predecessor state selections can transition an Asset Strategy record to the Active state.

- Assigning Security Users to Security Role.

Action	Example	Result
You assign a Security User to a Security Role.	You assign the Security User John Smith to the State Configuration Role Asset Strategy Reviewers.	That Security User can transition records: ◦ From any predecessor states to which that Security Role is assigned. ◦ To any successor states that are assigned to a Security User that is assigned to that Security Role. Example Result: John Smith can transition a record: ◦ From any predecessor states to which the Asset Strategy Reviewers Security Role is assigned. ◦ To any successor states that are assigned to a Security User that is assigned to the Asset Strategy Reviewers Security Role.

- Assigning Security Users to Security Roles.

Action	Example	Result
For a given record, you assign a Security User to a state.	For an Asset Strategy record, you assign the Security User John Smith to the Draft state.	Only that Security User can transition that record from that state. Example Result: Only John Smith can transition the Asset Strategy record from the Draft state.

About Baseline State Configurations

APM provides a baseline State Configuration for several families. If desired, you can extend a baseline State Configuration by adding new states and operations. You cannot, however, remove baseline states and operations that are flagged as **Reserved** in the **State Configuration** section. This limitation ensures that any baseline functionality that you can perform in the APM system using states and operations does not get modified or removed. Note that if an operation is reserved, APM users will not be able to select that operation from the datasheet in the Record Manager.

Tip: You can modify or remove any baseline states or operations that are not flagged as **Reserved**.

Baseline State Configuration Roles

The following Security Roles are available in the baseline APM:

- MI ACA Owner
- MI ASI User
- MI ASM Analyst
- MI HA Facilitator
- MI HA Owner

- MI RBI Analyst
- MI RCM User
- MI Recommendation Management User
- MI SIS Administrator
- MI SIS Engineer

About Assigning Security Roles to Predecessor States

You can assign Security Roles to successor states to define when users are allowed to transition a record to that state. For example, consider the State Configuration for the APM General Recommendation family, which contains the following predecessor and successor states for the Cancel operation:

- **Predecessor**: Reviewed
- **Successor**: Cancelled

You can confirm the predecessor and successor state for any operation by viewing the **Properties** window of that operation. In the following image, you can see on the **Properties - Cancel** window that for the Cancel operation, the predecessor state is Reviewed and the successor state is Cancelled. In the following image, you can see on the **Properties** window that for the Cancel operation, the predecessor state is Reviewed and the successor state is Cancelled.

In the following image, you can see on the **Properties-Reviewed** window that the State Configuration Role, MI Recommendation Management User, is assigned to the predecessor state: Reviewed.

As a result of this assignment, any user who is assigned to the Security Role, MI Recommendation Management User, will be allowed to transition a APM General Recommendation record out of the Reviewed state.

Notice that in the preceding image where the Recommendation Manager Role is outlined, the **Require a specific user to be assigned to a state** check box is selected. If it were selected, an additional layer of protection would be applied to APM General Recommendation records in the Reviewed state.

When the check box is cleared:

- Any user who is assigned to the Recommendation Manager Role can transition a record out of the Reviewed state.

When the check box is selected:

- For each individual record, only the user who is assigned to the Reviewed state for that record will be allowed to transition it out of the Reviewed state.

  In other words, the Security Role that is assigned to the state determines which Security Users are eligible to transition the record out of that state. Only the specific user that is assigned to the Reviewed state for a given record, however, will be allowed to move the record out of the Reviewed state.

Note: Security Users can be assigned to State Configuration Roles via the Security Manager.

About Assigning Security Roles to Successor States

You can assign State Configuration Roles to successor states to define when users are allowed to transition a record to that state. For example, consider the State Configuration for the APM General Recommendation family, which contains the following predecessor and successor states for the Cancel operation:

- Predecessor: Reviewed
- Successor: Cancelled

You can confirm the predecessor and successor state for any operation by viewing the **Properties** window of that operation. In the following image, you can see on the **Properties - Cancel** window that for the Cancel operation, the predecessor state is Reviewed and the successor state is Cancelled.

In the following image, you can see on the **Properties-Cancelled** window of the state that the Security Role, MI Recommendation Management User, is assigned to the successor state: Cancelled.

Properties - Cancelled

Cancel   Remove   OK

ID * :

MI_CANCELLED

Caption * :

Cancelled

☐ **Initial State**

☐ **Reserved State**

☑ **Require a specific user to be assigned to a state**

Available Roles:

☐ AQA Secured Super Users

☐ AQA SM2 Approvers

☐ AQA SM2 Authors

☐ AQA SM2 Implementation Team

☐ AQA SM2 Review Board

Selected Roles:

☐ MI RCM Administrator

☐ MI Recommendation Management User

As a result of this assignment, a user can transition a APM General Recommendation record to the Cancelled state if the Cancelled state is assigned to a user who is assigned to the Recommendation User Security Role.

Notice that in the preceding image where the Recommendation Manager Role is outlined, the **Require a specific user to be assigned to a state** check box is selected. If it were cleared, a layer of protection would be removed from APM General Recommendation records entering the Cancelled state.

When the check box is selected:

- A APM General Recommendation record can be set to the Cancelled state when any user who is assigned to the Recommendation User State Configuration Role is assigned to the Cancelled state.

When the check box is cleared:

- No one is required to be assigned to the Cancelled state in order for a user to transition it to the Cancelled state.

Note: Security Users can be assigned to Security Roles via the Security Manager.

Examples of Assigning Security Roles to States

Consider the following examples of assigning Security Roles to states and selecting or clearing the Require a specific user to be assigned to a state check box. All examples assume that:

- You are working with the APM General Recommendation family.
- The predecessor state is Reviewed.
- The successor state is Cancelled.

Example 1:

State	Assigned Role	Require a specific user to be assigned to a state?
Reviewed	Recommendation Manager	Yes (check box is selected)
Cancelled	Recommendation User	Yes (check box is selected)

In this scenario, if a APM General Recommendation record is in the Reviewed state, you can change it to the Cancelled state if:

- You are assigned to the Recommendation Manager Security Role.
- You are assigned to the Reviewed state for the APM General Recommendation record.
- Any member of the Recommendation User Security Role is assigned to the Cancelled state for the APM General Recommendation record.

Example 2:

State	Assigned Role	Require a specific user to be assigned to a state?
Reviewed	Recommendation Manager	No (check box is cleared)
Cancelled	Recommendation User	No (check box is cleared)

In this scenario, if a APM General Recommendation record is in the Reviewed state, you can change it to the Cancelled state if:

- You are assigned to the Recommendation Manager Security Role.

Note that:

- You are not required to be assigned to the Reviewed state for the APM General Recommendation record.
- No one is required to be assigned to the Cancelled state for the APM General Recommendation record.

Example 3:

State	Assigned Role	Require a specific user to be assigned to a state?
Reviewed	Recommendation Manager	Yes (check box is cleared)
Cancelled	Recommendation User	Yes (check box is selected)

In this scenario, if a APM General Recommendation record is in the Reviewed state, you can change it to the Cancelled state if:

• You are assigned to the Recommendation Manager Security Role.
• Any member of the Recommendation User Security Role is assigned to the Cancelled state for the APM General Recommendation record.

Note that:

• You are not required to be assigned to the Reviewed state for the APM General Recommendation record.

Example 4:

State	Assigned Role	Require a specific user to be assigned to a state?
Reviewed	Recommendation Manager	Yes (check box is selected)
Cancelled	Recommendation User	No (check box is cleared)

In this scenario, if a APM General Recommendation record is in the Reviewed state, you can change it to the Cancelled state if:

• You are assigned to the Recommendation Manager Security Role.
• You are assigned to the Reviewed state for the APM General Recommendation record.

Note that:

• No one is required to be assigned to the Cancelled state for the APM General Recommendation record.

Example 5:

State	Assigned Role	Require a specific user to be assigned to a state?
Reviewed	None	Yes (check box is selected)
Cancelled	None	Yes (check box is selected)

In this scenario, if a APM General Recommendation record is in the Reviewed state, no one will be able to change it to the Cancelled state because a specific user must be assigned to the Cancelled state but there are no Security Roles assigned to this state, meaning that no one is even eligible to be assigned to the Cancelled state.

Example 6:

State	Assigned Role	Require a specific user to be assigned to a state?
Reviewed	None	No (check box is cleared)
Cancelled	None	No (check box is cleared)

In this scenario, if a APM General Recommendation record is in the Reviewed state, anyone will be able to change it to the Cancelled state because there are no State Configuration Role restrictions and a specific user is not required to be assigned.

Access the State Configuration Section

About This Task

You can use the **State Configuration** section to define a new state or operation, or modify an existing state or operation for an **Entity** family.

Procedure

1. Access the Family Management page.
2. In the left pane, select **Entity**.
   The associated family list appears.
3. Select the family for which you want to define a State Configuration.
   The workspace for the selected family appears displaying the **Information** section.
4. At the top of the workspace, select **State Configuration**.
   The **State Configuration** section appears.

Add a New State to a Family

When defining the State Configuration for a family, keep in mind the workflow that you want users to follow. Then, create states and operations that facilitate that workflow and decrease the possibility of error. After defining the workflow between the states, you can display the states on the datasheet and manually move the states defined in a workflow.

Procedure

1. Access the **State Configuration** section.
2. Depending on your requirement:
   - If you are at parent family level, select **Enable State Functionality**.
   - If you are at the subfamily level and you want to use the state configuration defined at the parent level, select **Use Parent's Configuration** check box and then select **Enable State Functionality**.
   - If you are at the subfamily level and you want to define a new State Configuration, then select **Enable State Functionality**.

   The **Hide State Transition Control** check box and the **Add State** button appears enabled.
3. Select **Add State** to define a new state.
   The **Properties-New State** window appears.
4. As needed, specify the values in the following fields:

- **ID**: Delete the text that was generated automatically, and type an ID for the new state.
- **Caption**: By default, when you select the **Caption** box, it is populated automatically with the value that you typed in the **ID** box. You can change the caption if required.
- **Initial State**: Select the option if you want this state to be the initial state in the workflow.

  Note: You must have one state defined as the initial state and the initial state appears in dotted circle.
- **Reserved State**: This option is available only for the baseline states. If the state is marked as **Reserved State**, then you cannot delete that state. You can, however, modify the **Caption** of the state.
- **Require a specific user to be assigned for a state**: Select the option to assign a user for the state. When the record gets transitioned to that state, then you must assign specific user from the **Selected Roles**.

5. If you want the state to appear on the datasheet, clear the **Hide State Transition Control** check box. By default, the check box is not selected. If you do not want the state to appear on the datasheet, select the **Hide State Transition Control** check box, and then select **Save**.

   Note: You can now hide or show the state configuration on a datasheet for a subfamily, even if the state configuration is inherited from the parent family.
6. For the Roles:

   - To assign roles, in the **Available Roles** box, select the roles, and then select .
     The selected roles appear in the **Selected Role** box.

   - To remove the assigned roles, in the **Selected Roles** box, select the role and then select .
     The selected role is removed from the **Selected Roles** box.

   Note: You can select to search for a role.
7. Select **OK**.
   The **Properties** window closes and the new state appears on the workspace.

Disable State Functionality

☐ Hide State Transition Control | **Add Operation** | **Add State** | **Save**

8. Select **Save** to save the State Configuration.
   Your changes are saved.

Add a New Operation to a Family

Before You Begin

- To add an operation, you must have added at least two states.

Procedure

1. Define the states.
   The **Add Operation** appears enabled.
2. Select **Add Operation**.
   The **Properties-New Operation** window appears.
3. As needed, enter the values in the following fields:

   - **ID**: Delete the text that was generated automatically, and type an ID for the new operation.
   - **Caption**: The **Caption** box is populated automatically with the value that you typed in the ID text box. You can change the caption if desired.
   - **Predecessor State**: Select the state that should serve as the predecessor state, or the state from which this operation will transition a record. For example, if a record can go from Created to Assigned via the Assign operation, to add the Assign operation, you would need to select the Created state as the predecessor state.
   - **Successor State**: Select the state that should serve as the successor state, or the state to which this operation will transition a record. For example, if a record can go from Created to Assigned via

the Assign operation, to add the Assign operation, you would need to select the Assigned state as the successor state.

- **Is Reserved**: This option is available only for the baseline operation. If the operation is marked as **Is Reserved**, then you cannot delete that operation. You can, however, modify the **Caption** of the operation.

4. Select **OK**.
   The new operation appears on the workspace.
5. Select **Save** to save the State Configuration.
   The changes are saved.

Modify a State

You can modify the properties of an existing state. For example, you can change the caption of a state Draft to Draft 1, mark an existing state as initial state, remove the roles assigned to a state, and so on.

Before You Begin

- The state exists in the workspace.

Procedure

1. Access the **State Configuration** section
2. In the **Manage State Configuration** workspace, select the state that you want to modify.
   The **Properties-<Label>** window appears, where the <Label> is the name of the state that you want to modify.
3. As needed, modify the available fields.
4. To remove the assigned roles, in the **Selected Roles** box, select the role, and then select ⬅.
   The selected role is removed from the **Selected Roles** box.
5. Select **OK**.
   The updated state appears in the workspace.
6. Select **Save**.
   The state is modified.

Modify an Operation

You can modify the properties of an existing operation. For example, you can update the predecessor or successor state of an operation.

Before You Begin

- The operation exists in the workspace.

Procedure

1. Access the **State Configuration** section.
2. Select the operation you want to modify.
   The **Properties-<Label>** window appears, where the <Label> is the name of the operation that you want to modify.
3. Modify the fields as required.
4. Select **OK**.
   The updated operation appears in the workspace.

5. Select **Save**.
   The State Configuration operation is modified.

Delete a State

Before You Begin

- You cannot delete a state if it is the predecessor or successor state in an operation. Before you delete a state that is used in an operation, you must delete the operation. In addition, you can delete a state only if no records are currently set to that state.

Procedure

1. Access the **State Configuration** section.
2. In the workspace, select the state that you want to delete.
   The **Properties-<Label>** window appears, displaying the properties of the state, where <Label> is the name of the state that you want to delete.
3. Select **Remove**.
   The **Delete State** window appears asking if you want to delete the state.
4. Select **Yes**.
   The state is removed and no longer appears in the workspace.
5. Select **Save**.
   The State Configuration for the family is deleted.

Delete an Operation

Procedure

1. Access the **State Configuration** section.
2. In the **Manage State Configuration** workspace, select the existing operation.
   The **Properties-<Label>** window appears, where <Label> is the name of the operation.
3. Select **Remove**.
   The **Delete Operation** window appears asking if you want to delete the operation.
4. Select **Yes**.
   The operation is removed and no longer appears in the workspace.
5. Select **Save**.
   The State Configuration operation for the family is deleted.

Chapter

9

Associated Pages

Topics:

Associated Pages Construction and Configuration

Associated Pages are links that are configured for a specific family, and which provide access to internal or external locations, such as a page in APM, a webpage, or an external file. You can configure Associated Pages for any entity family so that when users view a record belonging to that family, links will appear on the Associated Pages pane to provide users with access to those items. Associated Pages are meant to provide additional information or functionality related to the record that is currently being viewed.

To create Associated Pages, you must be familiar with constructing URLs for APM features. When you create Associated Pages, it is useful to be familiar with URLs that use an Entity Key parameter as it allows you to pass the Entity Key of the record to the URL.

You can configure Associated Pages for the families through Configuration Manager. You have two options when designing the menu on which they will appear. You can:

- Place them directly on the root menu which is the root Associated Pages menu.
- Place them on one or more submenus, which cascade down from the root menu. Each submenu that you create can also contain one or more submenus of its own.
  If you choose to organize items on submenus, you can create one or more submenus, each with its own set of items. In addition, when you use submenus, you can divide the items on the menus into different groups.

Access the Associated Pages Section

Procedure

1. Access the Family Management page.
2. In the left pane, select **Entity**.
   The family list appears.
3. Select the family to which you want to add a new field.
   The workspace for the selected family appears, displaying the available tabs. By default, the **Information** section appears.
4. At the top of the workspace, select the **Associated Pages** tab.
   The **Associated Pages** section appears, displaying the grid populated with the Associated Pages that are already defined for the selected family.

Properties of Associated Pages

You can configure the properties of an Associated Page or a submenu when you add a new Associated Page or submenu for a family or by modifying an existing Associated Page or submenu that already exists for a family. In both cases, you can configure properties on the **Menu Information** window. The grid on the **Associated Pages** section displays a list of Associated Pages that are associated with a selected family and any submenus that are used to group the Associated Pages.

For each item in the list, the following columns of information are displayed:

- Type: A flag that indicates that the item is a submenu. The submenu can be a submenu of the root menu, which is either the root Associated Pages menu or it could be a submenu of another submenu.
- Appears On: The name of the menu on which the Associated Page will appear.
- Caption: The label that will appear for the Associated Page. If desired, you can manage translations for that string.

- URL: The URL that will be used to construct the link for the Associated Page. A value will appear in this field only for Associated Pages, not for submenus.
- Applies when: A flag that specifies when the Associated Page will appear. Each Associated Page can appear:
  - All the time: The Associated Page will always appear, regardless of other conditions that exist.
  - Only one record is selected: The Associated Page will appear only when one record is selected in the search results. Note that this option applies only when the Associated Page is displayed in the shortcut menu of search results.
  - When user is a Super User or a member of the MI Power User security group: The Associated Page will appear only when the user who is logged in to the APM Super User or a member of the MI Power User Security Group.
- Bold: A flag that indicates whether the label for the Associated Page will be displayed with bold text.

Fields of the Menu Information Window

Fields	Description	Behavior and Usage
Apply When	The option that indicates when the Associated Page should appear.	You can choose: • **All the time:** The Associated Page will always appear, regardless of other conditions that exist. • **Only one record is selected:** The Associated Page will appear only when one record is selected in the search results. • **When user is a Super User or a member of the MI Power User security group:** The Associated Page will appear only when the user who is logged in is a Super User. **Note:** If you change the **Apply When** settings of a submenu from **All the time** to a more restrictive option, a message appears, indicating that the change will be propagated to ALL of the child items. In addition, if you are configuring settings for a submenu, you cannot choose an **Apply When** setting that is less restrictive than that of the menu on which the submenu appears. For example, if the Inspection submenu appears on the Internal URLs submenu, which is configured to appear Only one record is selected, the Inspection submenu cannot be configured to appear All the time.
Appears On	Specifies the menu on which the Associated Page should appear.	This could be the root menu or a submenu appearing on either the root menu or another submenu. The default value is **Root Menu**, but you can select a submenu if any submenus have been created. This list is populated with an alphanumeric list of all the submenus defined for this family.
Caption	The text that will appear as the label for the Associated Page.	This field is required. You can create a separator by typing a hyphen in the **Caption** field.
Hyper Link Information	Configures the properties of an Associated Page.	Selected by default.

Fields	Description	Behavior and Usage
Make Bold	Specifies whether or not you want the Associated Page to appear in bold text.	You can select the check box if you want the Associated Page to appear in bold text.
Sub-Menu Information	Configures the properties of a submenu that is used to group Associated Pages.	You can select one or more submenus, which cascade down from the root menu.
URL	The URL for the Associated Page.	This field appears when you select **Hyper Link Information** and is a required field for all Associated Pages. You can specify an internal APM URL or an external URL. In either case, you must define the scheme within the URL (e.g., https://).

Associated Page URLs

The base URL route that is used for associated pages is **record-manager**. The following table describes the various paths that build on the route, and the elements that you can specify for each.

Parameter	Description	Accepted Value(s)	Notes
Other	Passes Entity Key to an Associated Pages URL.	Numeric Entity Key	Passes the Entity Key from Record Manager to an Associated Page URL.

Example: Associated Page URLs

Example URL	Destination
#record-manager/**[enty_key]**	Passes the Entity Key from Record Manager to an Associated Page URL.

Passing Values from Records into URLs on the Associated Pages

Via Configuration Manager, you can create Associated Pages for a family. When you are viewing a record that belongs to a family, these Associated Pages will appear as links in the **Associated Pages** pane. You can create Associated Pages using any URL that uses the #<name of the page> or http:// as the scheme.

The following examples show several ways to pass a value to a URL.

Example 1: Pass a Single Value Parameter into a URL

Suppose that you have created a report and the report contains a parameter (P0) that accepts an entity key of Full Inspection family record. When you provide an entity key, the report displays data for Full Inspection record. You can create a link in the **Associated Pages** pane so that you will be able to view this report whenever you are viewing a record in Full Inspection. To do so, you would construct a URL as follows:

```
#ssrs/viewer/Public\Meridium\Modules\Inspection\Reports\Full Inspection
Report/P0=[ENTY_KEY]
```

- `#ssrs/viewer/Public\Meridium\Modules\Inspection\Reports\Full Inspection Report` specifies the report to open in the Report Viewer.
- `Public\Meridium\Modules\Inspection\Reports\Full Inspection Report` is the Catalog path and file name of the report that you want to open.
- P0 specifies that you are supplying a value for the first prompt in the report.
- [ENTY_KEY] is the variable that will be replaced at runtime by the entity key of the actual Full Inspection record that you are viewing.

Example 2: Pass a Multi-Value Parameter into a URL

Suppose that you have created a report and the report contains two parameters. The first parameter (P0) accepts an entity key and the second parameter (P1) accepts a static value. After the P0 and P1 parameters are provided, the report displays data for Full Inspection record. You can create a link in the **Associated Pages** pane so that you will be able to view this report whenever you are viewing a record in Full Inspection. To do so, you would construct a URL as follows:

```
#ssrs/viewer/Public\Meridium\Modules\Inspection\Reports\Full Inspection
Report/P0=[ENTY_KEY]/P1=[Value]
```

- `#ssrs/viewer/Public\Meridium\Modules\Inspection\Reports\Full Inspection Report` specifies the report to open in the Report Viewer.
- `Public\Meridium\Modules\Inspection\Reports\Full Inspection Report` is the Catalog path and file name of the report that you want to open.
- P0 specifies that you are supplying a value for the first parameter in the report.
- [ENTY_KEY] is the variable that will be replaced at runtime by the entity key of the actual Full Inspection record that you are viewing.
- P1 specifies that you are supplying a value for the second parameter in the report.
- [Value] is the static value that you provide to open the report.

  Note: If you do not provide any static value for this parameter, then a window will appear and you will need to manually select the value for P1.

Example 3: Pass a Multiple Value Parameter into a URL

Similarly, in the previous example, if P1 accepts multiple static values (Value 1 and Value 2), then you can create a link in the **Associated Pages** pane so that you will be able to view this report whenever you are viewing a record in Full Inspection. To do so, you would construct a URL as follows:

```
#ssrs/viewer/Public\Meridium\Modules\Inspection\Reports\Full Inspection
Report/P0=[ENTY_KEY]/P1=[Value_1]/P1=[Value_2]
```

- `#ssrs/viewer/Public\Meridium\Modules\Inspection\Reports\Full Inspection Report/P0=[ENTY_KEY]/P1=[Value_1]/P1=[Value_2]` specifies the report to open in the Report Viewer.
- `Public\Meridium\Modules\Inspection\Reports\Full Inspection Report/ P0=[ENTY_KEY]/P1=[Value_1]/P1=[Value_2]` is the Catalog path and file name of the report that you want to open.
- P0 specifies that you are supplying a value for the first parameter in the report.
- [ENTY_KEY] is the variable that will be replaced at runtime by the entity key of the actual Full Inspection record that you are viewing.
- P1 specifies that you are supplying multiple values for the second parameter in the report.
- [Value_1] and [Value_2]: are the static values that you provide to open the report.

Note: If you do not provide any static value for these parameters, then a window will appear and you will need to manually select the values for P1.

Syntax for Variable Parameter Values in Associated Pages

In the Configuration Manager, you can create Associated Pages, which are URLs that are associated with a specific entity family. Associated Pages will be available in the APM when a user is viewing a record that belongs to a family for which Associated Pages have been defined. In general, the syntax for URLs that serve as Associated Pages is the same as the syntax for URLs that you construct in the APM. One exception to Associated Pages is the URL syntax for specifying a variable parameter value. In the APM system, variable parameter values in query URLs are surrounded by $ (dollar signs). For URLs that serve as Associated Pages, variable parameter values are surrounded by [ ] (square brackets).

Consider an example where the Tank family has a Manufacturer_ID field that stores the name of the company that manufactured the Tank. Now, suppose a query exists that returns a list of tank failures and contains a prompt, with the prompt ID Manufacturer, which accepts the name of a given manufacturer. The purpose of the prompt is to limit the query results to those failures associated with the specified manufacturer. Using this example, you could create a link on the Associated Pages menu that executes this query and passes in to the Manufacturer prompt the Manufacturer ID from the Tank record that is displayed in the Record Manager.

The URL for the link might look something like this: `meridium://Registry/QueryBuilder? QueryPath=Public\Meridium\Queries\Failures by Manufacturer&Manufacturer=[Manufacturer_ID]`

This URL contains one variable parameter value: Manufacturer_ID. When a user executes the Associated Page, the value from the Manufacturer_ID field in the current Tank record will be passed to the Manufacturer prompt in the Failures by Manufacturer query. As a result, the query will return a list of failures associated with the manufacturer of the Tank record that you are viewing at any given time.

Create a New Associated Page or Submenu

About This Task

The following instructions apply to configuring an Associated Page, whether it appears on the root menu or a submenu.

Procedure

1. Access the **Associated Pages** section.
2. In the grid, select ➕.
   The **Menu Information** window appears.
3. Configure the properties as required on the **Menu Information** window.

   a) If you want to create an Associated Page, select **HyperLink**.

      -or-

      If you want to create a submenu, select **SubMenu**.

   b) In the **Appears On** box, select the menu on which the Associated Page or the submenu should appear.

   c) In the **Caption** box, enter the text that will serve as the label for the Associated Page or a submenu.

d) For the **Hyperlink** option, in the **URL** box, enter the URL for the Associated Page.

e) In the **Apply When** list, select when you want this menu to appear.

f) If you want the Associated Page or the submenu header to appear in bold text, select **Make Bold** check box.

g) Select **OK**.
The **Menu Information** window closes, and the Associated Page grid displays the new Associated Page or submenu that you have created.

4. Select ⊟.
The new Associated Page or submenu is saved for the selected family.

Note: The newly created associated page will be available for you in Family Management, whereas to access the associated page from other modules, you must log out and log in to APM. For other users who are being logged in to APM, the associated page will be available only when they log in to the application again.

Modify an Existing Associated Page or Submenu

You can modify the properties of any Associated Page or submenu that has been configured for a family.

Before You Begin

- Create Associated Page or Submenu.

Procedure

1. Access the **Associated Pages** section.

2. In the grid, select the item that you want to modify, and then select ✎ .
The **Menu Information** window appears, displaying the information that is currently defined for the selected item.

3. Modify the information as required.

    Note: Modifying the **Apply When** option of a submenu will automatically modify any related submenus.

4. Select **Save**.
The **Menu Information** window closes, and the grid displays the updated information.

5. Select ⊟.
A confirmation message appears, indicating that the updates are saved.

    Note: The associated page with the modifications will be available for you in Family Management, whereas to access the associated page with the modifications from other modules, you must log out and log in to APM. For other users who are being logged in to APM, the associated page with the modifications will be available only when they log in to the application again.

Delete Associated Page or Submenu

Deleting a submenu will also delete any related Associated Pages. If you want to delete submenus without deleting the Associated Pages that are configured to appear on them, first modify the properties of the Associated Pages such that they do not appear on the submenu that you are deleting.

Procedure

1. Access the **Associated Pages** section.

2. In the grid, select the item that you want to delete, and then select 🗑.
   A message appears, asking if you want to delete the selected items. If the selected item is a submenu, the message will indicate that deleting the item will also delete any Associated Pages that are configured to appear on the submenu.

3. Select **Yes**.
   The dialog box closes, and the item no longer appears in the list.

4. Select 💾.
   A confirmation message appears, indicating that the updates are saved.

   Note: The deleted associated page will no longer be available for you in Family Management, whereas to ensure that the associated page is not accessible from other modules, you must log out and log in to APM. For other users who are being logged in to APM, the deleted associated page will not be available only when they log in to the application again.