## Revision History

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1 Introduction

The SDSFIE Online Model Builder is a web application that provides for the creation and editing of SDSFIE-based data models. The resulting models are an adapted version of the model on which they are based, with the exception of models created by direct import of an Esri XML Workspace document.

NOTE: While this document provides a comprehensive description of the use of the Model Builder, the extensive video training on the SDSFIE Online web site is recommended as an alternate source of information on the functionality of this tool.

2 Get Started

In order to access the Model Builder tool, navigate to the SDSFIE Online website home page (Figure 1).

2.1 Login

If an account has been registered and approved, the user can login by:

Entering Username
Entering Password
Then, select Login to advance to the next screen.

Site Registration

If an account has not been registered for the SDSFIE Online website, select ‘Register’ to access the registration page.

Forgotten Password Forgotten Username

To retrieve a forgotten password, select ‘Reset My Password’.
To recover a forgotten username, select ‘Recover My Username’.
2.2 Launch the Application

Once the login process has been completed, hover over the “Models & Workflows” button then select “Model Builder”.

Figure 3: SDSFIE Online Website Home Page
3 How to use The Model Builder Tool

The Model Builder Tool provides the ability to build an adaptation from an existing parent model, import an adaptation from a file, and view/edit an existing model.

3.1 Build a New Model

The first step to creating a new model is completing the Name and Description fields on the Introductory tab (in red, in Figure 4, below). This is done by:

1. Naming the model
2. Giving the model an alias name
3. Giving the model a version number (optional)

3.1.1 Build a New Model from an Existing Parent Model

To build a new model from an existing parent model, follow the steps below:

1. Select the Component of the parent model from the drop down menu
2. Select the Version of the parent model from the drop down menu
3. Select the parent model from the text field
4. Select “Build New Model” button
   a. The “Reset Fields” button will erase all entered information
5. Model Builder will create the new model then display the Model Builder Page. The Model Builder Page displays the model in a tree view format. Information on viewing and editing the model is described in section 3.3.
3.2 Import an Adaptation from a File

The Model Builder tool allows importing a model adaptation directly from a file. There are two accepted file types:

1. An Excel workbook that describes an adaptation as differences from a parent model (named the “Adaptation Submission Workbook”)
2. An XML Workspace document that represents an Esri geodatabase.

3.2.1 Import the Adaptation Submission Workbook (Excel)

3.2.1.1 Import the Adaptation Submission Workbook
Select the “Import Adaptation Submission Workbook” button to import an adaptation from an Excel file. The system will then present the Import Adaptation Submission Workbook dialog box. The format of the Excel Adaptation Submission Workbook is very specific to Model Builder. An example Adaptation Submission Workbook is also provided and can be downloaded by selecting the “Get example Adaptation Submission Workbook” link. Blank template files are provided and can be downloaded by selecting the “Get blank Adaptation Submission Workbook template” link.
3.2.1.2 Select the File

Navigate to the populated Adaptation Submission Workbook file, and select it for import:

1. Click the Choose File button
2. Select the file to import and click the Open button

3. Because populated Adaptation Submission Workbooks are rarely error-free, an option exists to validate the content before performing the import. The validation checks the structure of the file and checks some of the validity of the file content. To do this, click to check the Validate Only checkbox and then click Import to begin the validation process.
Progress messages will be displayed in the Progress area and errors and warnings will be displayed in the Errors/Warnings area.

a. If there are errors, read the error message and make the indicated adjustments to the Adaptation Submission Workbook content. This process may need to be done iteratively until the Adaptation Submission Workbook is valid.

b. If there are no errors, move to the next step.

4. Once validated, the Adaptation Submission Workbook can be imported. To do this, uncheck the “Validate Only” checkbox then click Import.

5. Errors may occur during importing which the validation process doesn’t detect because of the complicated nature of the adaptation process. Any remaining content errors will be reported during the import process and should be fixed by following the instructions in the error message.

6. If the Business Requirements sheet and the Requirements (Policy) Documents sheet are populated, the document information will be inserted into the respective database tables by component. Any entity elements which have been linked to the documents in the Adaptation Submission Workbook will be linked in the database using the linking tables. Only Component Admins for the component can import Adaptation Submission Workbooks with Business Requirements or Requirements Documents.

7. Once the “Success!” message displays after the progress messages, select “Close” to close the Import Adaptation Submission Workbook dialog. The new adaptation appears in the “Select Existing Model to View/Edit” area. To begin further edits or to view the model, simply select the newly created model and click Edit Existing Model. The Model Builder Page displays the selected model in a tree view format. Information on viewing and editing the model are described in section 3.3.
3.2.1.3 Importing Business Requirements and Requirement Documents

Business Requirements and Requirement Documents are created by importing an Adaptation Submission Workbook which contains these items. Business Requirements/Requirement Documents can only be created by Component Admins. If the user does not have the “Component Admin” role, the creation of the Requirements Documents and creation of the Business Requirements are skipped during the Import Adaptation Submission Workbook process.

If the user has the “Component Admin”, verify the “Submitter Component” of the Adaptation Submission Workbook matches the user’s component.
The “Component” column of the Business Requirements needs to match the “Submitter Component” on the Project Sheet. The Requirements Documents “#s” column link with number of the Requirements Document to which it is tied.

3.2.2 Import Workspace File (ESRI XML)

Appendix A and Appendix B provide instructions for creating a model by importing an XML Workspace file. To begin additional editing, or to view the newly imported model, simply select the newly created model and select “Edit Existing Model”. The Model Builder Page displays the selected model in a tree view format. Information on viewing and editing the model are described in section 3.3.
3.3 View/Edit an Existing Model

The Model Builder tool allows users to view and edit existing models.

3.3.1 Select a Model

To view or edit an existing model:

1. Select the model from the list of models
2. Select the “Edit Existing Model” button

![Figure 12: Model Selection Interface](image-url)
3.3.1.1 Profile a Model

Profile (delete) a model by selecting the “Profile Model” option from the “Model” menu in the top left corner of the detail window. This option profiles the model and displays the introductory page where the model status is updated to display a status of Profiled.

Figure 13: Profile Model from Model Builder Page
3.3.1.2 Restore a Profiled (Deleted) Model

Models which have been deleted are easily accessible. This is accomplished by completing these steps:

1. Check the “Show Deleted Models” checkbox
2. Select the profiled model
3. Click the “Restore Model” button

Once these steps are completed, the status of the model will change from Profiled to Draft.

![Figure 14: Model Status Change](image)

By following the steps above, the model status changes from Profiled to Draft.
3.3.2 Edit Model Detail

To edit the details of the model, such as name or description:

1. Select the model and Click “Edit Existing Model” (See 3.3.1)
2. Click on the Model Detail tab
3. Edit the details as needed
4. Click the “Save Changes” button

![Figure 15: Model Detail Tab and Saving Changes](image)
3.3.3 Edit an Element within a Model

To edit an element within a model:

1. Click on the expand (+) button to expand the tree view, as needed (and as shown in Figure 16, below)

2. Then right click within the tree view to edit the model in one of the following ways:
   a. Create New (see Section 3.3.3.1)
   b. Import New (see Section 3.3.3.2)
   c. Profile / Restore (see Section 3.3.3.3)
   e. Merge Existing Model into Model (see Section 3.3.3.4)
   f. Create New Merged Entity / Merge Entities into this Entity (see Section 3.3.3.5)

![Figure 16: Editing Model Elements](image)
3.3.3.1 Create New
A new element can be added to the model by right clicking any level in the tree view. The following diagram (Figure 17) depicts what is available at each level.

![Figure 17: Creating New Model Elements](image)

3.3.3.2 Import New
Elements can be imported by right clicking any level in the tree view. The following diagram (Figure 18) depicts what is available at each level.

![Figure 18: Importing New Model Elements](image)

3.3.3.3 Profile/Restore
An elements can be profiled or restored by right clicking any level in the tree view. Profiled elements will not show up in Browse/Generate or Data Dictionary views.
3.3.3.4 Merge Existing Model into Model

By clicking on the Model menu link

Clicking on the link opens the Import Configuration form.

The "From Configuration" is the model to be imported into the model designated in the "From Configuration" dropdown. Note that importing multiple adaptations into a single adaptation one at a time is allowed. Reset clears the form.
3.3.3.5 Create New Merged Entity / Merge Entities into this Entity
Entities in a child adaptation can be merged together. This will create a merge record in the database which will help during a migration of data from the parent data model to the child data model. There are several different ways to merge entities in the model builder workflow. The merge process can be started by:

1. Clicking the "Model" menu drop-down in the top left corner
2. Right clicking on an element at the folder level
3. Right clicking on an element at the entity level

Clicking “Create New Merged Entity” after any of the above steps will cause the “Select Entities to Merge” window to open with the full list of entities in the left “Possibilities” list, and nothing populated in the right “Entities to Merge” list. When right clicking on the entity Level there is a second merge option named “Merge Entities into this Entity”. Selecting this will cause the “Select Entities to Merge” window to open with the “Entities to Merge” list populated with the entity selected with the right click.

![Select Entities to Merge Window](image)
3.3.3.5.1 Select Entities to Merge

The “Possibilities” list displays the entities available to be merged. The list is filtered by the permissible geometries of the entities selected for the merge. To select an entity for merge, click on the entity then select the right arrow. This action moves the entity from the “Possibilities” list to the “Entities to Merge” list and filters the remaining entities in the “Possibilities” list. Selecting an entity in the “Entities to Merge” list and clicking the left arrow will move the entity back to the bottom of the “Possibilities” list. Once all entities to be merged are in the “Entities to Merge” list, click the “Next” button to continue to the next step in the merge process.

Figure 22: Populated Entities to Merge
3.3.3.5.2 Define the Merged Entity

The next step in the merge process is to define the target entity. If the merge process was started by selecting “Create New Merged Entity” link, then the next window will be empty and all the information will need to be filled out for the target entity. If the process was started by selecting “Merge Entities into this Entity”, the window will be populated with information for the selected entity and fields which can’t be changed are disabled.

![Define the Merged Entity form blank](image)

Figure 23: Define the Merged Entity form blank

After completing the “Define the Merged Entity” form by populating the required fields and any optional fields, use the “Next” button to move on to the next step. A “Previous” button is available to go to the previous step in case changes need to be made.

![Populated Define the Merged Entity form](image)

Figure 24: Populated Define the Merged Entity form
3.3.3.5.3 Select Attributes for the Merged Entity

The next form in the merge process is the “Select Attributes for the Merged Entity” form. Select attributes to be added to the merged entity from the list of attributes tied to all entities selected for the merge.

All attributes are automatically selected to be tied to the target entity but some attributes are disabled as SDSFIE standards state these attributes are required to be in the target entity. This is the case for the following categories of attributes:

1. Standard attributes
2. Attributes tied to source entities that are required
3. Attributes existing in the entity when merging into an existing entity.

Attributes which do not fall in the above categories can be deselected, meaning they will not exist in the target entity.
After deselecting attributes not desired for the target entity, press the “Next” button to continue on to the next step in the entity merge process. A “Previous” button is available to go to the previous step in case changes need to be made.
### 3.3.3.5.4 Set Defining Attribute

The next step is defining the attribute/enumenrat values. After clicking “Next” on the attribute selection window, the user receives a prompt about using an existing attribute as the defining attribute, which is used to distinguish between the merged entities. When merging one entity into a different existing entity, this prompt will not display and the merge process moves to the “Declare Defining Attribute/Enumerant” step.

Selecting “Yes” opens the “Select Existing Attribute as Defining Attribute” form. A drop-down form is populated with selected attributes which are constrained by an enumeration and have a data type of “Char” or “String”. If “Yes” is selected and none of the attributes meet the criteria, an alert appears with this information. Clicking "OK" will display a blank “Declare Defining Attribute/Enumerant” form.
Selecting “No” opens the “Declare Defining Attribute/Enumerant” form.

3.3.3.5.4.1 Use Existing Attribute

Selecting “Yes” displays the following form which allows users to select an attribute from the drop-down list as the defining attribute. Selecting the “Cancel” button skips this step and displays a blank “Declare Defining Attribute/Enumerant” window.

After selecting an attribute from the “Select Defining Attribute List”, the “Declare Defining Attribute/Enumerant” window opens with the Attribute Model Name, Attribute Alias Name, and Attribute Definition populated and disabled. The data type is set and disabled for the following cases:

- Defaults to “YesOrNo” when merging one entity into a different existing entity
- Defaults to “Char” when merging 3 or more entities into a new entity
- Default to “Char” when merging 2 or more entities into an existing entity

The user can select a different attribute by clicking “Previous” on the “Declare Defining Attribute/Enumerant” form to return to the “Select Attributes for the Merged Entity” form then following the steps again.
3.3.3.5.4.2 Declare Defining Attribute/Enumerant

The “Declare Defining Attribute/Enumerant” form allows the user to tie defining values to each entity. When an existing attribute is the defining attribute drop-downs display with a list of enumerants tied to the attribute’s constraining enumeration. The defining value can be an enumerant selected from the drop-down or typed in manually.

![Declare Defining Attribute/Enumerant form from Existing Attribute](image)

The data type is enabled when merging 2 entities into a new entity and an existing attribute is not selected as the defining attribute. In this case, the data type options are “YesOrNo” and “Char”. If “YesOrNo” is selected, one value must be “Yes” and the other value must be “No”.

When creating a defining attribute value with a data type of “Char”, any value can be entered into the text fields.
Selecting the “Previous” button displays the “Select Attributes for the Merged Entity” form and clears all attribute information entered/selected. Selecting the “Save” button submits the information for the merge process and opens a window with an auto-scrolling information field reporting the steps of the merge process.

When the “Progress” window is completed and there aren’t messages in the “Errors/Warnings” window, select the “Close” button to close the window and reload tree.
3.3.3.6 Edit Business Requirements / Requirements Documents
Selecting an entity in the tree opens an entity detail page in the right portion of the window.

Selecting the “Business Requirements/Requirements Documents” button opens the “Requirements” window.
If the adaptation’s component does not have business requirements or requirements documents, the window will appear blank.

![Image of the Requirements window with blank Business Requirements and Requirements Documents sections.](image.png)

*Figure 36: No Requirements Documents or Business Requirements for Adaptation’s Component*
If the Adaptation’s Component has Business Requirements and Requirements Documents, the window appears with items for checking/unchecking.

![Requirement Window of Entity without Ties to Requirements](image)

*Figure 37: Requirement Window of Entity without Ties to Requirements*
If Requirements Documents are tied to Business Requirements which are tied to an Entity, the Requirements Documents will be checked in the Requirements Documents Grid as well as the Business Requirements.

![Figure 38: Business Requirements and Requirements Documents Tied to Entity](image)

### 3.4 Model Submission and Review

The Model Builder tool allows a user to submit a completed model and allows Component Managers and Adaptation Reviewers to review and approve/reject the submitted model.

The workflow for a user to submit a model is as follows:

1. Create a draft model
2. Add/Edit/Profile elements in the model
3. Submit the model for review

The workflow for a Component Manager/Adaptation Reviewer to review the model is as follows:

1. Review the submitted model and Approve/Reject elements
2. If elements are rejected, send back to owner for modification (Reject the model)
3. Repeat the first two steps until model has no rejected elements
4. Approve the model
3.4.1 Submit a Model for Review
To submit a model for Review:

1) Select the model and click “Edit Existing Model” (See 3.3.1)

2) Click the 'Model' menu drop-down at the top-left of the page

3) Select “Submit Model”

4) Select ‘Yes’ on the verification dialog box.

Click the 'OK' button on the success dialog box
3.4.2 Rejecting / Approving Model Elements

Adaptation review and approval is available to individuals within a Component who have an “Adaptation Reviewer”, “Adaptation Approver”, and/or “Component Admin” role. If a user account is tied to this functionality the user will see a set of radio buttons in the top part of the 'View/Edit an Existing Model' selection box on the introduction page.

![Figure 40: Adaptation Approver Available Radio Buttons](image)

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When using the Adaptation Reviewer portion of Model Builder, there are multiple ways to approve/reject draft elements inside the model. These actions and results are described below.

1. To approve or reject an element individually, click the ‘Approve' or ‘Reject' buttons on the bottom of the Element Detail page in Model Builder.

![Figure 41: Approve/Reject Individual Element Buttons](image)
2. To approve or reject multiple elements in the tree, right click an element and select Approve or Reject. All draft elements tied to the selected (right-clicked) element will be approved/rejected as well. Figure 42 shows the location of these buttons in the interface.

3. To approve all draft elements in a model, select 'Approve All Draft Elements' from the 'Model' menu in the top left corner of the page (see Figure 43).
Recommended Practice:

When a model is being reviewed by a team of Reviewers it is recommended to only “reject” elements (and not “approve” any elements) until the model is being reviewed by the last person in the team. When an element is “approved”, the status of this element is changed and the previous status of the element is lost. Reviewers later in the line of reviewing won’t have any indication that these elements were submitted as “draft” and updated to “approved” by a previous reviewer.

To avoid this problem, if the first reviewer doesn’t “approve” the element but leaves it as “draft”, then the next reviewer can determine what was changed and will be able to review all of the model changes. The last (final, or lead) reviewer can then decide that all of the remaining draft elements are “approved”, since they weren’t rejected at any time throughout the review process. At that point, the last reviewer can use the ‘Approve All Draft Elements’ button to update the remaining draft elements before completing the review.

3.4.3 Rejecting/Approving a Model

3.4.3.1 Unlock Model

Only one reviewer is allowed to review a submitted model at a time. When a reviewer selects a model for review the model is locked and a lockout counter is set for one hour. If a reviewer is done reviewing but isn’t ready to complete the review process, the reviewer should click the ‘Unlock Model’ button from the ‘Model’ menu drop-down. This button will take the reviewer to the introduction page and unlock the model so other reviewers can review the model. This button is also used if a reviewer is done reviewing at the current time but will continue reviewing at a later point in time. Figure 44 shows the ‘Unlock Model’ button in the ‘Model’ menu drop-down.

Figure 44: Unlock Model Button
3.4.3.2 Complete Review

Reviewers should review the model and reject when they see problems such as duplicated concepts, misspellings, etc. If no problems occur, the model should approve be approved.

When the review process has been completed by a reviewer, or a team of reviewers, the last reviewer should complete the review using the ‘Complete Review’ button in the ‘Model’ menu drop-down, as shown in Figure 45.

There are three cases for completing a review:

4. If any draft elements exist, a pop-up will inform the reviewer there are draft elements and the model can be rejected and returned to the owner with a justification for rejection.
   
   a. The reviewer could also cancel the pop-up and use the ‘Approve All Draft Elements’ button from the ‘Model’ menu drop-down mentioned in 3.4.2 to get rid of these draft elements.

5. If there are no draft elements, but there are rejected elements, a pop-up will display asking for a justification for rejection.

6. If there are no draft elements or rejected elements, then the model becomes approved.

Steps 2 and 3 will result in the reviewer being returned to the introduction page, the model being unlocked and the model being removed from the list of submitted models and returned to the draft list of the owner with an updated status icon.
Appendix A – Exporting an XML Workspace from ArcGIS

To export an XML Workspace document for import into the SDSFIE Registry use ArcCatalog or the Catalog view in ArcMap.

The steps are as follows:

1. In the Catalog tree, of either application, right-click the geodatabase, feature dataset, feature class, or table to export; select the ‘Export’ item from the dropdown menu; then select XML Workspace Document option (as shown in Figure 46, below).

![Image](image.png)

Figure 46: ArcCatalog with the Export XML Workspace Document menu exposed

2. Export the schema without any records from the feature classes and tables by clicking the ‘Schema Only’ option. Specify the path and name of the new XML file.
   a. The file can be saved as an XML file or as a compressed ZIP file. To specify the file type, give the file an .xml, .zip, or .z extension when typing the path and name into the text box.
   b. Specify the file type in the ‘Save As’ dialog box if specifying the path and name by browsing to a folder from the ‘Save As’ dialog box.
   c. Check “Export Metadata” to export the metadata along with the data.
3. Click 'Next>' to preview the contents of the schema information to be copied.
   a. This panel (as shown in Figure 485, below) lists all the data items for which schema information will be copied.
   b. Uncheck the 'Include' check boxes to not export certain feature classes, tables, or relationship classes.

Click “Summary…” to review a summary of the extraction contents and other optional settings. Click “Finish” to export the schema.
Appendix B – XML Workspace Import

Selecting the “Import Workspace File” button, presents the Import XML Workspace form. This will be the point of interface until the XML Workspace has been imported into the SDSFIE Registry.

![Figure 49: Import XML Workspace Form displaying “Browse Files” button location](image)

Select Steps to Perform and Related Options

The seven major steps in the import process are depicted in Figure 50:

1. **Step 1: Transform XML Workspace (Mandatory)**

Step 1 transforms the XML Workspace into a Structured Query Language (SQL) procedure that will be used in the next step. The transformation process extracts information from the metadata of the XML Workspace document to add into the registry.
The information extracted includes model names, alias names, definitions, descriptions, notes, justifications, and much more. Using the SDSFIE-M Metadata Style for ArcGIS enables this kind of information to be added directly into the metadata. The Browse/Generate Workflow also exports all of this kind of information into the metadata of the XML Workspace documents that it generates from models stored in the SDSFIE Registry.

**Best Practice:** Use the SDSFIE-M Metadata Style for ArcGIS to input entity and attribute documentation metadata so that 1) it is available in ArcGIS, 2) it is available in any metadata file or XML Workspace document exported from ArcGIS, and 3) it can be imported into SDSFIE Online.

If the model was generated using SDSFIE Online (and the Browse/Generate tool) or model names were added to the metadata using the SDSFIE-M Metadata Style for ArcGIS, XML Workspace Import tool will transform the names from the XML Workspace into the model names provided. The tool will store the names that are replaced in this manner as alternate names. This functionality can be turned off by unchecking the "Replace feature and object class names with model names" check box in the XML Workspace form (see Figure 49).

**Best Practice:** Alternate names can be created by providing an XML Workspace input file that has a) <ModelName> tags or metadata containing model names. The former can be accomplished by either generating from Browse/Generate or by editing the XML Workspace directly. The latter can be accomplished using the SDSFIE-M Metadata Style for ArcGIS.

The content of the <Name> tags will be used for the alternate names. Alternate names can also be created by using Model Builder’s “Import Adaption Excel” functionality.

This step is not optional and is executed no matter what file the user selects for import. It is therefore not mentioned in the user interface. However, progress messages are displayed from this step as the XML Workspace is validated and processed using an XML Stylesheet Language Transformation (XSLT) process; thus, keep you can keep track of where it is in the file by noticing the progress messages preceded by the word “XSLT”.

- **Step 2: Create Initial Model (Mandatory)**

Step 2 executes the SQL procedure created in Step 1 and creates a draft model in the SDSFIE Registry. At this point the model is almost exactly like the model in ArcGIS.

This step is mandatory and is executed no matter what file the user selects for import. It is, therefore, not mentioned in the user interface. Progress messages from this step are preceded by the word “SQL”.

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1 Available at [https://metadata.ces.mil/dse/ns/DISDI/sdsfiemetadatastyle](https://metadata.ces.mil/dse/ns/DISDI/sdsfiemetadatastyle)
• **Step 3: Conflate Geometry (Optional)**

Step 3 performs the process of “conflating geometries”. This optional process will combine all feature classes in the XML Workspace document that are the same concept except for differing geometry (and in some cases, attribution).

This step is necessary because in ArcGIS a feature class can only have a single allowable geometry type, while in an SDSFIE logical data model (LDM), an entity can have multiple allowable geometries. This is why we may see “Entity_P”, “Entity_L”, and “Entity_A” to represent that same concept with three different geometries in ArcGIS. In the case of the example just provided, the Conflate Geometry step will create a single entity named “Entity” in the LDM in the SDSFIE Registry.

The Conflate Geometry step is smart enough to locate geometry conflation candidates by a) examining metadata generated by SDSFIE Online or b) examining names and taking into account default suffixes used to indicate geometry. Specify what the “geometry suffixes” are, to inform the XML Workspace Import tool, so it can take advantage of that information when locating geometry conflation candidates. Using the default geometry suffixes (“_P”, “_L”, and “_A”), the Validation Workflow would identify the candidate in the previous paragraph for example.

**Best Practice:** Make sure to name (or rename) feature classes which represent the same concept using a standard set of geometry suffixes so the Validation Workflow can correctly identify conflation candidates.

This step is optional, but is turned “on” by default, which is why there is a check mark by the phrase “Conflate Geometry” in the user interface (see Figure 51). The interface allows setting the geometry suffixes, as well, with a default of “_P”, “_L”, and “_A”.

Figure 51: Import XML Workspace Form displaying “Steps to Perform” defaults

- **Step 4: Conform to Parent Model (Optional)**

Step 4 performs a matching of entities in the XML Workspace document with names in a “parent model” selected by the user and then conforms matched entities in the XML Workspace to those matched in the parent. Select a model to serve as the parent model for the imported XML Workspace, this means the XML Workspace represents an adaptation of that parent model. The intention of “selecting a parent model” is to specify the particular SDSFIE-V LDM that is the parent of the imported feature and object classes.

The matching is done by comparing the Name and the ModelName elements in the XML Workspace for the feature or object class with the “Model Name” in SDSFIE. The metadata can also contain a “Model Name” field and, if present, the Validation Workflow will use that name in matching. Note that, if the “Replace feature and object class names with model names” check box is checked, then replacement will occur BEFORE Step 4 and the Name elements will be stored as alternate names.

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2 This check box is located near the top left of the window, just under Status Bar.
When the Validation Tool is conforming the model to the parent, it does a number of conforming tasks to the elements in the model. It only does these conforming tasks if there is a "Model Name" match between the imported feature or object class and the parent model. The tasks are:

1) Update the entity properties to match the entity properties from the parent. See the SDSFIE-V Implementation Guidance to see all of the entity properties. This task will always import any superclass of the entity matched in the parent into the imported model. A sub-option tells the Validation Workflow to profile that superclass so that it is not included in generation output.

2) For the matched entity, add any attributes in the parent that are not in the imported entity. A sub-option tells the Validation Workflow to profile any added attributes so that they are not included in generation output.

3) For the matched entity, update the attribute properties to match the attribute properties from the parent. This tasks will update the properties of all attributes in the imported entity that match the attributes of the parent entity to be like those in the parent. See the SDSFIE-V Implementation Guidance to see all of the entity properties.

4) For the matched entity and any matching attributes, update the constraining enumeration, if there is one, to be the same as that in the parent. If this is off, then the constraining enumeration will be as imported.

This step is optional, but is turned “on” by default, which is why there is a check mark by the phrase “Match Parent Model” in the user interface (see Figure 51 and 52). The interface allows selecting a parent model from a dropdown list of approved models (see Figure 53). Options that provide for the cases above are also include on the interface. The parent model will not be selectable from the “Additional Models” pulldown in the “Replace Missing Definitions with Definitions from Other Models” step because it is the model used under the “Replace Missing Definitions with Definitions from Parent Model” step.
Figure 52: Import XML Workspace Form displaying “Parent Model” dropdown and all options.

Figure 53: Import XML Workspace Form displaying “Parent Model” dropdown open
• **Step 5: Define Conceptual Matches (Optional)**

Step 5 provides for the cases in which, for a feature or object class that is identical to a concept in the parent model, but has a different name than in the parent model, and would like to conform it to the parent entity as in step 4. For example, consider a feature class in the imported model named “ControlledAccess” that is the same concept as “AccessControl” in the parent model. By making the match for the Validation Workflow, it is identified as a conceptual match. The Validation Workflow will present a list of extended entities\(^3\) as potential conceptual match candidates, and allows selection of a profiled entity (those entities in the parent model that did not match anything in the imported model) as a conceptual match. Once all matching is complete, the Validation Workflow will conform the model using the exact options specified in step 4.

Step 5 is optional, but is turned “on” by default, which is why there is a check mark by the phrase “Define Conceptual Matches” in the user interface (see Figure 52).

• **Step 6: Replace Missing Definitions (Optional)**

Step 6 extracts definitions from matched entities (and their attributes and so on) in the parent and replaces anything in the imported model (Step 6a). Step 6 can also try to find definitions from other models (Step 6b). Finally, the user is consulted to supply definitions and can do so interactively.

Best Practice: Users should provide definitions for all entities and attributes in the metadata (using a Metadata Style such as the SDSFIE-M Metadata Style for ArcGIS) before exporting the XML Workspace document.

  o **Step 6A: Replace Missing Definitions from Parent Model (Optional)**

When replacing missing definitions with definitions from the parent model, XML Workspace Import will determine if there is a match between the names of the elements in the import and the names of the elements in the model. If it finds a match, then it will populate the definition from the parent model into the imported element.

This step is optional, but is turned “on” by default, which is why there is a check mark by the phrase “Replace Missing Definitions from Parent Model” in the user interface (see Figure 54).

  o **Step 6B: Replace Missing Definitions from Other Models (Optional)**

When replacing missing definitions with definitions from other models, XML Workspace Import will cycle through the Selected Models, in order, and, perform match and replace as in the parent model case. The order that the models appear in the Selected Model list is the order in which they are processed, so be sure to select them in the order to be processed.

The selection of models is done using two dropdowns (depicted in Figure 54). The available models are in the left dropdown. Once selected, the model is moved into the

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\(^3\)“Extended entities are feature types and object classes in the imported model that have “Model Names” that do not match any entity in the parent model.
right pulldown and is thus added to the selected list. When a model is selected in the right pulldown it is moved into the left pulldown thus removing it from the selected list. This step is optional, but is turned “on” by default, which is why there is a check mark by the phrase “Replace Missing Definitions from Other Model” in the user interface (see Figure 54).

![Figure 54: Import XML Workspace Form displaying “Replace Missing Definitions Other Models”](image)

- **Step 7: Finalize (Mandatory)**

Step 7 is a mandatory step that adds or updates any missing standard attributes and real property attributes, and also performs other model cleanup procedures. The following sub-steps (depicted in Figure 55) within the Finalize step are optional:

- **Add Missing Standard Attributes** — If selected, XML Workspace Import will add any SDSFIE Standard Attributes that are missing. These attributes will conform to parent model version. If the Match Parent Model step is not included, the user is prompted to provide the version of standard attributes to include (as in Figure 56).

- **Add Missing Standard Attributes at Latest Version** — If selected, XML Workspace Import will add any SDSFIE Standard Attributes that are missing. These attributes will conform to SDSFIE-V Implementation Guidance, version 4.0.
• Update Standard Attributes — If selected, XML Workspace Import will update any SDSFIE Standard Attributes found in the imported entities to conform to parent model version. If the Match Parent Model step is not included, the user is prompted to provide the version of standard attributes to update (as in Figure 56).

• Update Standard Attributes at Latest Version—If selected, XML Workspace Import will update any SDSFIE Standard Attributes found in the imported entities to conform to SDSFIE-V Implementation Guidance, version 4.0.

• Update Real Property Attributes—If selected, XML Workspace Import will update any SDSFIE Real Property Attributes found in the imported entities to conform to parent model version. If the Match Parent Model step is not included, the user is prompted to provide the version of real property attributes to include (as in Figure 56).

• Update Real Property Attributes at Latest Version—If selected, XML Workspace Import will update any SDSFIE Real Property Attributes found in the imported entities to SDSFIE-V Implementation Guidance, version 4.0.

Figure 55: Import XML Workspace Form displaying “Finalize Options” defaults
Starting the Import Process
Once the optional steps to perform and the related options have been selected, clicking the “Import” button begins the import process (see Figure 57). If the import button is disabled, then one of two things need to occur:

1) Select the XML file to import
   OR
2) Select the parent model to match
**Interaction During the Import Process**

Once the import process begins, the interface will provide visual feedback about what is going on. Depending on the optional steps collected, further feedback may need to be provided to the process via user interaction. These cases are explained in the following sections.

- **Accept Geometry Conflation Step**

  If the Conflate Geometry step is selected to execute AND one or more candidates are detected (the candidate recordset), each candidate in the recordset will have the opportunity to be adjusted and approved. There are three inputs required per conflation candidate (see Figure 58):

  1) What is the model name of the resulting conflated entity? This is provided in the “Model Name” text box.

  2) What is the default geometry? This is indicated by clicking on the “Make Default” check box by the appropriate geometry.

  3) Is the candidate approved? This is indicated by clicking on the “Approve?” checkbox and will have the effect of advancing to the next candidate.
Best Practice: It is assumed that because a geometry is in the imported model, it should be made permissible in the corresponding SDSFIE LDM in the Registry. Therefore, to not include a geometry, remove the corresponding feature class from the XML Workspace by not including it when exporting from ArcGIS (see Figure 48). Once all of the correct items have been approved, click the “Accept Geometry Conflations” button.

Figure 58: Import XML Workspace Form at “Geometry Conflation” step

Once all geometry conflation candidates have been visited (and approved or not), confirm the decision to perform the conflations approved in the previous step (as in Figure 59).
• **Provide Conceptual Matches**

If Define Conceptual Matched step is selected to execute AND one or more entity extensions are detected in the import (the candidate recordset) AND one or more entities in the parent model have been profiled (do not exist in the imported model), then conceptual matches can be made to the parent model for each match candidate in the recordset.

A pulldown is provided that contains all profiled entities from the parent model (see Figure 60). If a conceptual match exists, find the conceptual match in the pulldown and select it. This will result in an assignment of the concept as a match (see Figure 61).

Once all match candidates have been visited and assigned (or not assigned), clicking “Make Concepts Match” button will perform the updates to the imported model after a confirmation step (see Figure 62).
Figure 60: Import XML Workspace Form at "Make Concepts Match" step

Figure 61: Import XML Workspace Form at "Make Concepts Match" step with a match made
• **Replace Missing Definitions**

If the Replace Missing Definitions step is selected to execute AND one or more elements exist where definitions are not found in either the parent or other models (the candidate recordset), a definition can be provided for each candidate in the recordset.

For each candidate, a text area is provided to enter the definition and a check box that must be checked to make the actual definition assignment (see Figure 63). A “View Context…” window is provided that contains the details of the entity (for which the definition is missing) to display the structure of the feature or object class (see Figure 64).

Once all match candidates have been visited and assigned or not, clicking “Make Concepts Match” button will perform the updates to the imported model after a confirmation step (see Figure 65).
Figure 63: Import XML Workspace Form at “Missing Definitions” step

Figure 64: Import XML Workspace Form after clicking “View in Context” for missing definitions step
• **Go Back in XML Workspace Import**

![Figure 65: Import XML Workspace Form after clicking “Accept All” for missing definitions step](image)

![Figure 66: Import XML Workspace Form at completion of Import process](image)
• **Close XML Workspace import**

**Figure 67: Import XML Workspace Form displaying “Close” button.**