

Oracle Financial Services Model Management and Governance

User Guide

Release 8.1.1.0.0

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ORACLE
Financial Services

OFS Model Management and Governance User Guide

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1 Preface

This preface provides information for the Oracle Financial Services Model Management and Governance application (OFS MMG) User Guide.

Topics:

- [Access to Oracle Support](#)
- [Audience](#)
- [Additional Resources](#)
- [Conventions Used](#)
- [Acronyms](#)

1.1 Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit:

- <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info>
- <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs> if you are hearing impaired.

1.2 Audience

This document is intended for the system administrators and users configuring the workspace and models in OFS MMG.

1.3 What is New in This Release

Workspace

- Support Append option for Data Population
You can choose to either overwrite the data or append to the existing data.
- Support Rejection Threshold during Workspace Population
You can provide the maximum number of inserts that can fail while loading data to a given table from all the sources. In case of threshold breach, all the inserts into the particular Target Schema will be rolled back. However, it will continue with populating the next Target Schema.
- Support Data Population for Secondary and other Workspace Schemas.
- Data Population using Scheduler Service.
- For more information, see the *Populate a Workspace* Section.
- Allow Data Sourcing from multiple sources.

- For more information, see the Managing Data Source Section.
- New theme for UI.

General

- Login Screen Application name is configurable now.

Pipeline Builder

- Threshold Sets Creation
- Execution parameters and Threshold Sets creation Model Run Summary
- Model Run Compare - Inputs/Outputs
- Pipeline Script Template **Refresh**, Auto-align, Revert-align, Hide/Show Overview, and Show Full Labels options on Pipeline Canvas.

For more information, see the Create Paragraphs using Pipeline Designer Section.

Model Enhancements

- Allow for Model deletion in Production
- Support ipynb notebook dump imports
- Remove Add Model/Objective option in Production Workspace

Data Pipeline

For more information, see the Managing Data Source Section.

Dataset: Support of Dataset to manage the entire operation related to Data Set.

For more information, see the Managing Dataset Section.

1.4 Additional Resources

This section identifies additional resources for the OFS MMG Application Pack. You can access the online documentation for the OFS AAI 8.1.1.0.0 from the [Oracle Help Center \(OHC\)](#) and the OFS MMG 8.1.1.0.0 from the [Oracle Help Center \(OHC\)](#).

- OFS Model Management and Governance Release Notes
- OFS Model Management and Governance Installation Guide

To find additional information about how Oracle Financial Services solves real business problems, see our website at www.oracle.com/financialservices.

1.5 Conventions Used

The following table lists the conventions used in this guide.

Table 1: Conventions Used in this Guide

| Convention | Meaning |
|---------------------------|---|
| <i>Italics</i> | <ul style="list-style-type: none"> Names of books, chapters, and sections as references Emphasis |
| Bold | <ul style="list-style-type: none"> The object of an action (menu names, field names, options, button names) in a step-by-step procedure Commands typed at a prompt User input |
| Monospace | <ul style="list-style-type: none"> Directories and subdirectories File names and extensions Process names Code sample, including keywords and variables within the text and as separate paragraphs, and user-defined program elements within the text |
| Hyperlink | Hyperlink type indicates the links to external websites, internal document links to sections. |

1.6 Acronyms Used

The following table lists the acronyms used in this guide.

Table 2: Acronyms Used in this Guide

| Conventions | Description |
|---|---|
| BA | Business Analysts |
| Infodom | Information Domain |
| Navigation Tree Menu or Navigation Menu | Left-hand side menu |
| OFS AAI | Oracle Financial Services Analytical Application Infrastructure |
| OFSAA | Oracle Financial Services Analytical Applications |
| OFS MMG | Oracle Financial Services Model Management and Governance |
| Production Infodom | Production Information Domain |
| Sandbox Infodom | Sandbox Information Domain |
| SA | System Administrator |
| URL | Uniform Resource Locator |
| UI | User Interface |

2 Getting Started

This section gives an introduction to OFS Model Management and Governance and the requirements to use the application.

Topics:

- [About this Guide](#)
- [About Oracle Financial Services Model Management and Governance](#)
- [Oracle Financial Services Model Management and Governance Workflow](#)
- [Components of Oracle Financial Services Model Management and Governance](#)
- [Mapping User Groups](#)
- [Signing into the Oracle Financial Services Model Management and Governance Application](#)
- [Using the Application UI Features](#)
- [Using the OFS MMG Compliance Studio Application](#)

2.1 About this Guide

This guide has information about configuring and publishing workspaces using the OFS Model Management and Governance application. The further sections in this guide provide information for the creation and deployment of models into production. Use it for information about workspace and model management or help with the processes in the application. For other products such as OFS AAI, see the [Additional Resources](#) section.

2.2 About Oracle Financial Services Model Management and Governance

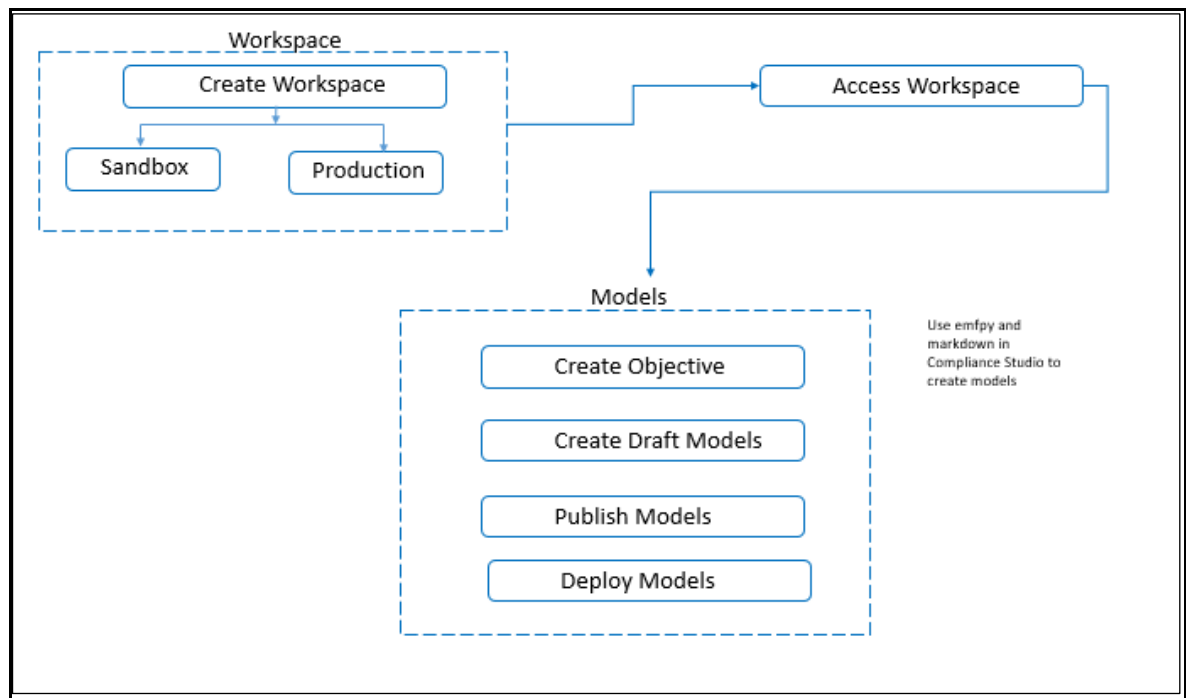
Financial institutions require models that work on traditional statistical techniques, modern machine-learning methods, computational and simulation models. Oracle Financial Services Model Management and Governance leverage the Data Studio environment to develop, deploy, and manage models at the enterprise level.

The OFS Model Management and Governance application enables institutions to implement their IT policies while providing flexibility and freedom that Data Scientists and Statistical Modelers desire. OFS MMG's design facilitates financial institutions to manage external regulatory and internal governance policies by building testing models in a workspace environment. A workspace is provisioned and authorized for use (usually by an administrator) before making it available to modelers. Administrative users grant analysts and modelers access to workspaces along with a subset of production data to build models. Validated and approved models can then be promoted from workspaces to the enterprise model repository. Models in the repository can then be woven into analytical application flows crafted by mixing data management tasks, model execution, and deterministic business logic.

2.3 Oracle Financial Services Model Management and Governance Workflow

The workflow involves the creation of workspaces and the creation of Models mapped to the Workspaces. Models are then configured as training models that you can use to perform model visualizations and test for the outcomes. You can then publish a model into production and make it available to users after you have determined that the models and the parameters used to construct the models meet the requirements of your business logic.

Figure 1: Oracle Financial Services Model Management and Governance Workflow



2.4 Components of Oracle Financial Services Model Management and Governance

The following are the components of Oracle Financial Services Model Management and Governance application:

- [Workspace Management](#)
- [Model Management](#)
- [Dataset](#)
- [Scheduler Service](#)
- [Model Audit](#)
- [Model Actions](#)

2.4.1 Workspace Management

Workspace Management is where the workspace Administrators define datasets and make them available to modelers in Oracle Financial Services Model Management and Governance. It is an environment where the data is prepared for modelers to use in their modeling creation activity.

Workspaces are provisioned with the data required for modeling by administrators, who configure workspaces with subsets of production data. The data in the workspace is made available to modelers using datasets, who then build models with the dataset without any exposure being provided to the physical data tables and columns in the database. In effect, the data is ready for the modelers and they do not have to undergo the arduous task of accessing and querying the database. See the [Using Workspace Management](#) section for information on how to use Workspace Management in the application.

2.4.2 Model Management

Modeling refers to the process of designing a prototype based on a structured data model, for statistical analysis and to simulate real events and processes. Models in a workspace can be created or modified by a user with access to the workspace. Model versions are preserved in the workspace along with execution and output histories. Once a model has been validated in the workspace and considered fit for use, modelers can request to push the model into the production environment.

[Use Model Management](#) to create models from pre-defined models to predict business trends and validate the existing models with the help of Compliance Studio.

2.4.3 Scheduler Service

The Scheduler Service is a service in the infrastructure system that automates behind-the-scenes work that is necessary to sustain various enterprise applications and functionalities. This automation helps the applications to control unattended background jobs program execution.

The Scheduler Service contains a graphical user interface and a single point of control for the definition and monitoring of background executions.

2.4.4 Dataset

The Dataset allows you to manage the entire operation related to data set.

2.4.5 Model Audit

The Model Audit window provides the complete details of model. This shows the information such as, when Model was created, who created the Model, workflow of Model, for example when this Model became champion or deployed, and so on.

2.4.6 Model Actions

The Model Actions window allows you to view the list of models associated with the workspace.

2.5 Mapping User Groups

Users must be mapped to User Groups that are mapped to the required roles to access OFS MMG. The following subsections provide information about the user groups and roles required in addition to the information about configuring the user groups.

Topics:

- [User Groups](#)
- [User Group - Role Mapping](#)

2.5.1 User Groups

The following table gives details about the User Groups in the Oracle Financial Services Model Management and Governance application. See the [Oracle Financial Services Analytical Applications Infrastructure Administration Guide](#) for more information.

Table 3: User Groups

| User Group Name | User Group Description |
|-----------------|--|
| IDNTYADMN | Identity Administrator group |
| IDNTYAUTH | Identity Authorizer group |
| MDLREV | The Modeling Reviewer Group. Users mapped to this group have access to the menu items in the OFS COMPLIANCE STUDIO application that are related to model review activities. |
| MDLAPPR | The Modeling Approver Group. Users mapped to this group have the rights to approve models created by the users. |
| MDLBATCHUSR | The Modeling Batch User. Scheduler can use this Group for executing batches. |
| WKSPADMIN | The Workspace Administrator Group. Users mapped to this group have access to all the menu items in the OFS COMPLIANCE STUDIO application. Additionally, they have authorization rights to create and populate workspaces. |
| MDLUSR | The Modeling User Group. Users mapped to this group have access to all the menu items in the OFS COMPLIANCE STUDIO application that is related to model creation. |
| DSUSRGRP | General Role Users mapped to this group have permission to access/modify MMG Studio Interpreter Configurations. |

| User Group Name | User Group Description |
|-----------------|--|
| DSREDACTGRP | Roles for applying redaction in graph. This group will be applicable to only those users for whom graph redaction is required. |

NOTE

At the first-time login, User Group mappings are initialized from AAI/IDCS for the newly provisioned users. These will be reflected in MMG Admin Console in next MMG login.

If User Group mappings are deleted in AAI/IDCS, it would not delete in MMG Admin Console. Admin needs to delete this in MMG Identity screens too.

Only the group with MDLSUMM role will be displayed in the Workspace provisioning steps.

MDLSUMM function is mapped to the MDLACCESS role.

2.5.2 User Group - Role Mapping

Map the user groups in the application to the roles in the following table to enable access to the OFS MMG application.

Table 4: User Group to Role Mapping

| Group Name | Role Name |
|-------------|------------------------|
| DSREDACTGRP | DSREDACT |
| IDNTYADMN | Batch Advance Role |
| IDNTYADMN | Batch Write Role |
| IDNTYADMN | Admin Link Role |
| IDNTYADMN | User Advanced Role |
| IDNTYADMN | Group Advanced Role |
| IDNTYADMN | Role Advanced Role |
| IDNTYADMN | Function Advanced Role |
| IDNTYAUTH | Group Authorize Role |
| IDNTYAUTH | User Authorize Role |
| IDNTYAUTH | Group Read Role |
| IDNTYAUTH | Admin Link Role |
| IDNTYAUTH | Function Read Role |

| Group Name | Role Name |
|-------------|------------------------|
| IDNTYAUTH | Role Read Role |
| IDNTYAUTH | Role Authorize Role |
| MDLAPPR | DSINTER |
| MDLAPPR | Model Authorize |
| MDLAPPR | Model Deployment |
| MDLAPPR | Workspace Read |
| MDLAPPR | Model Read |
| MDLAPPR | Model Access |
| MDLAPPR | Workspace Access |
| MDLAPPR | DSAPPROVER |
| MDLBATCHUSR | DSBATCH |
| MDLREV | Workspace Read |
| MDLREV | Model Review |
| MDLREV | Model Access |
| MDLREV | Workspace Access |
| MDLREV | DSUSER |
| MDLREV | Model Read |
| MDLUSR | Model Advanced |
| MDLUSR | Model Write |
| MDLUSR | Model Read |
| MDLUSR | Batch Advance Role |
| MDLUSR | Model Execute |
| MDLUSR | DSUSER |
| MDLUSR | Model Access |
| MDLUSR | Workspace Access |
| MDLUSR | Workspace Read |
| MDLUSR | Datasource Access |
| MDLUSR | Datasource Write |
| MDLUSR | Datasource Read |
| WKSPADMIN | Workspace Access |
| WKSPADMIN | DSADMIN |
| WKSPADMIN | Identity MGMT advanced |
| WKSPADMIN | Workspace Authorize |

| Group Name | Role Name |
|------------|-----------------|
| WKSPADMIN | Workspace Read |
| WKSPADMIN | Workspace Write |
| DSUSRGRP | DSADMIN |

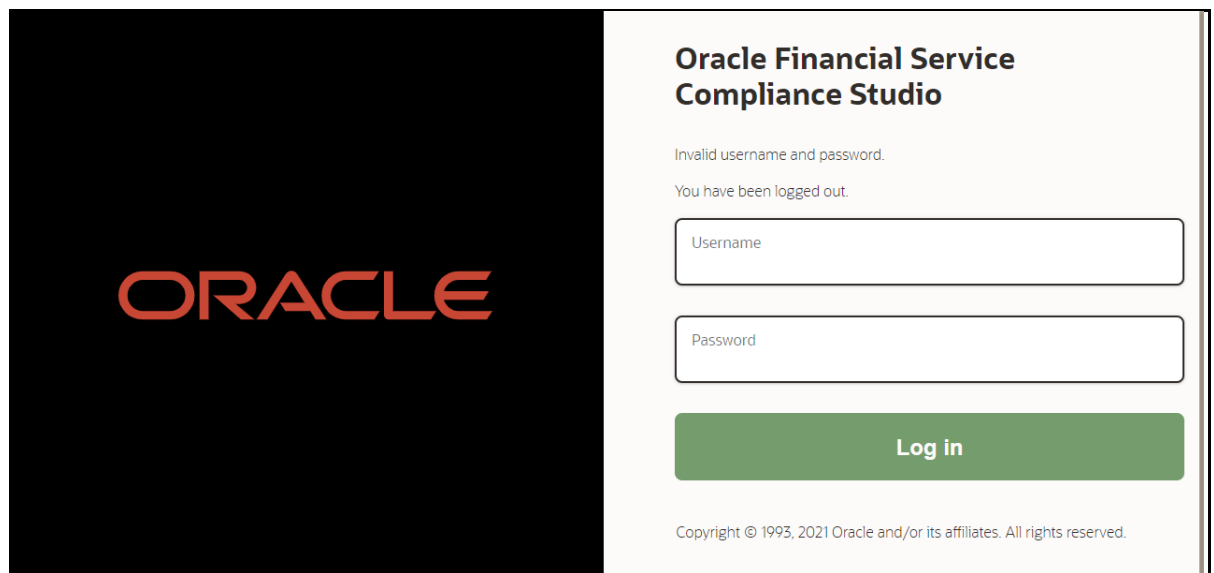
2.6 Signing into the Oracle Financial Services Model Management and Governance Application

After the application is installed and configured, you can access the Oracle Financial Services Model Management and Governance application.

To access Oracle Financial Services Model Management and Governance, follow these steps:

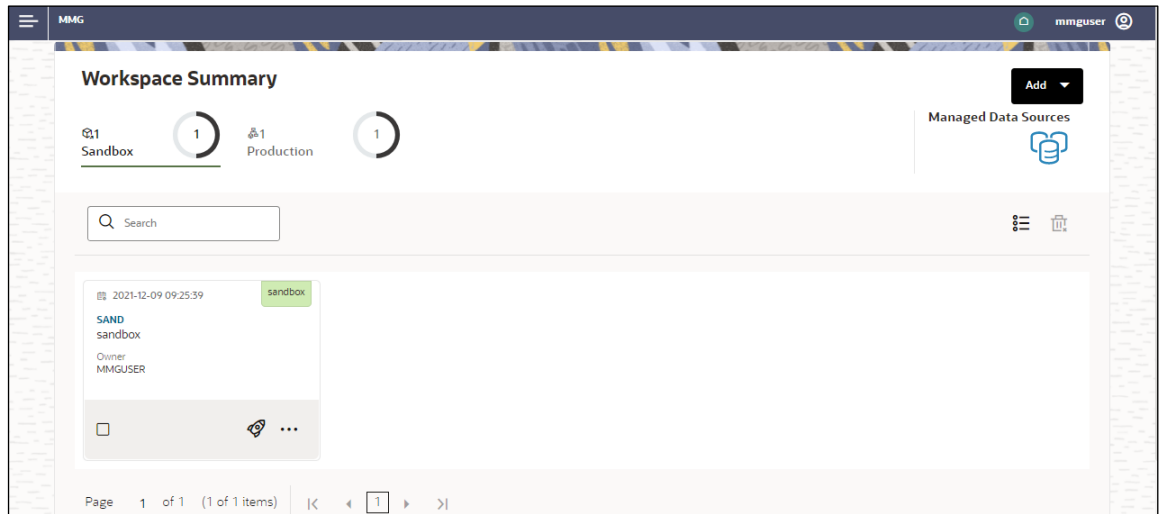
1. Enter the application URL in your browser. The **Login** page is displayed.

Figure 2: OFS Model Management and Governance Application Login Page



2. Enter your **User ID** and **Password**.
3. Click **Log in**. The Workspace Summary page is displayed.

Figure 3: Model Management and Governance Application Selection



2.7 Using the Application UI Features

This section describes the user-interface of the Oracle Financial Services Model Management application. These are the common features that are found across the modules of Oracle Financial Services Model Management. It describes the organization of the user interface and provides step-by-step instructions for navigating through the application.

Topics:

- [Home Page Components](#)

2.7.1 Home Page Components

The Home Page contains the following sections:



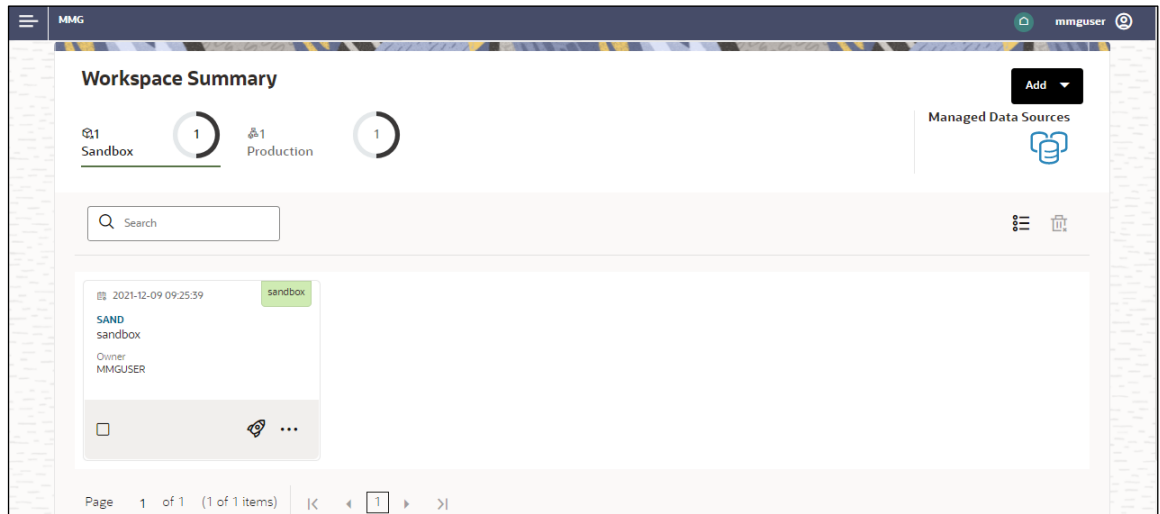
- Header
- Home icon 
- Application Navigation 
- Workspace Summary

Figure 4: Home Page



2.7.1.1 Home Page icon



Click **Home** icon to navigate to Workspace Summary page from **any other window in MMG application**.

2.7.1.2 Application Navigation



Click Application Navigation icon to navigate to Dashboard, Dataset, Advance Options, and other sections of MMG application.

2.7.1.3 Header

The Header displays icons, buttons, and text for generic information and access to the OFSAA application's features. The following user-interface elements are displayed for OFS MMG:

- **User Name:** Displays the logged-in user name. Click this to select from the following options in the drop-down list:
 - **Admin:** Navigate to IDCS page.
 - **Logout:** Select to log out of the application.

2.7.1.4 Workspace Summary

Shows the list of Workspaces. Select the checkbox next to the Workspace that you want to View, Edit, Copy, or Delete. Click **Add** to create a new Workspace. You can search a Workspace using Workspace Code, Owner, Creation Date, or Workspace Type fields. The search list shows the Workspace details with Workspace Code, Owner, Creation Date, and Type.

2.8 Using the OFS MMG Compliance Studio Application

The OFS MMG application displays windows and pages that are interconnected to the OFS AAI and Compliance Studio. Primarily, you will create Workspace. Within these Workspaces, you will create models, compare them for the best fit, and promote one to production.

Use the information in the following topics to create the workspaces and models:

- [Using Workspace Management](#)
- [Using Model Management](#)

2.8.1 Prerequisites

The prerequisites for OFS MMG are as follows:

- To create a workspace, your user profile must be mapped to the Workspace Administrator role. For more information, see the [User Groups](#) section.
- To use a workspace to create models, your user profile must be mapped to the Model User role (such as a modeler). For more information, see the [User Group - Role Mapping](#) section.

3 Using Workspace Management

Workspace management allows you to create and manage workspaces in the Financial Services Model Management and Governance application.

Workspace can be in the production environment (deployed) or they can exist in a separate instance on their own (on local for testing purposes) with a copy of data that comes from the desired data source (production or external data source).

You can view the following details on Workspace Summary page:

- Number of Sandbox Workspaces
- Number of Production Workspaces
- Managed Data Sources

Topics:

- [Accessing the Workspace Summary Page](#)
- [Create A Workspace](#)
- [Launch A Workspace](#)
- [Populate A Workspace](#)
- [Delete A Workspace](#)

3.1 Accessing the Workspace Summary Page

The Workspace Summary page gives access to the various workspace functions such as create and delete.

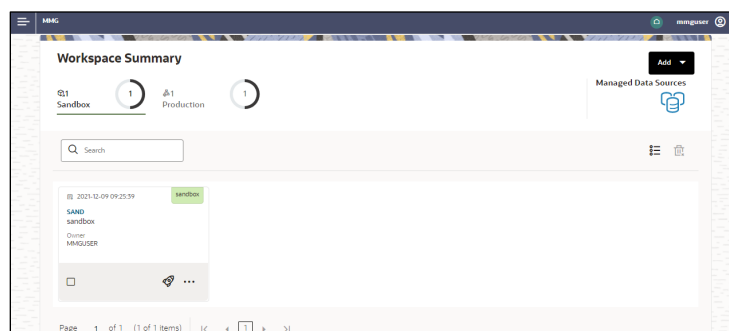
NOTE

Users Groups must be mapped to the Workspace Admin role to access the Workspace Summary page.












To access the Workspace Summary page, follow these steps:

After login to **Financial Services Model Management and Governance** application, the **Workspace Summary** page is displayed. The page displays workspace records in a table.

Figure 5: Workspace Summary Page



The following table provides descriptions for the fields and icons on the **Workspace Summary** page.

| Field or Icon | Description |
|--------------------|---|
| Search | The field to search for Workspace. Enter specific terms in the field for which you want to search and press Enter on the keyboard to display the results. |
| Card and Grid View | Click the Card View  or Grid View  on the top-right corner of this pane to view the workspace as a block or a table, respectively. |
| Delete All | Click Delete All  to delete all the Workspaces. |
| Workspace Code | The code of the Workspace. |
| Description | The description for the Workspace |
| Creation Date | The date on which the Workspace was created. |
| Type | Shows the type of Workspace as Sandbox or Production |
| Add | Click Add  and select Workspace to create a new Workspace. See the Create a Workspace section for more information. |
| Launch Workspace | Click Launch Workspace  next to corresponding workspace to display the Workspace Dashboard with application configuration and model creation menu. See the Launch a Workspace section for more information. |
| Populate Workspace | Click Action  next to corresponding Workspace and select Populate Workspace  to populate the workspace with dataset data. See the Populate a Workspace section for more information. |
| Edit Workspace | Click Action  next to corresponding Workspace and select Edit Workspace  to edit the Workspace. |
| Delete Workspace | Click Action  next to corresponding Workspace and select Delete Workspace  to delete the Workspace. See the Delete Workspace section for more information. |

3.2 Create a Workspace

The Workspace creation requires entry of the source of dataset, validation, and deployment. Besides, the OFS MMG application may require users of different function groups to create and approve a Workspace. In other words, a user associated with the modeler function group creates a Workspace and the approval and deployment are done by a user associated with the modeling administrator function group. See the [Mapping User Groups](#) section for more information.

UGDOMMAP function should be mapped to the user performing sandbox creation operation. Otherwise the create operation will fail.

To create a Workspace, follow these steps:


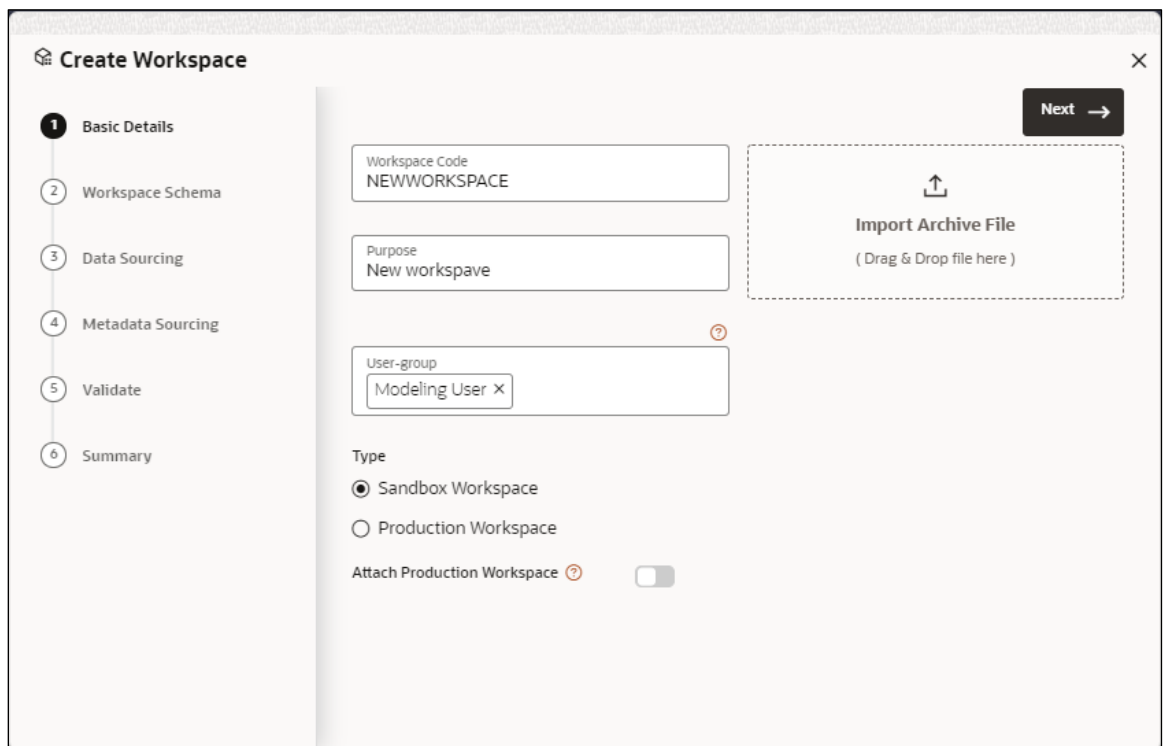
1. Navigate to Workspace **Management** Summary page to display the **Workspace Summary** page. The page displays workspace records in a table.
2. Select  to create a Workspace in the Workspace **Summary** window.

Figure 6: Workspace Creation Window



The screenshot shows the 'Create Workspace' window with a progress indicator on the left. The steps are: 1. Basic Details, 2. Workspace Schema, 3. Data Sourcing, 4. Metadata Sourcing, 5. Validate, and 6. Summary. The 'Basic Details' step is currently active. The form contains the following fields and options:

- Workspace Code:** NEWWORKSPACE
- Purpose:** New workspave
- User-group:** Modeling User (with a close icon)
- Type:** Sandbox Workspace, Production Workspace
- Attach Production Workspace:**

On the right side, there is a dashed box labeled 'Import Archive File' with the instruction '(Drag & Drop file here)'. A 'Next' button with a right arrow is located in the top right corner.

The window displays a progress indicator at the left that indicates the active window

where you are entering details. Click **Previous**  to go back a step

and click **Next**  to go to the next step.

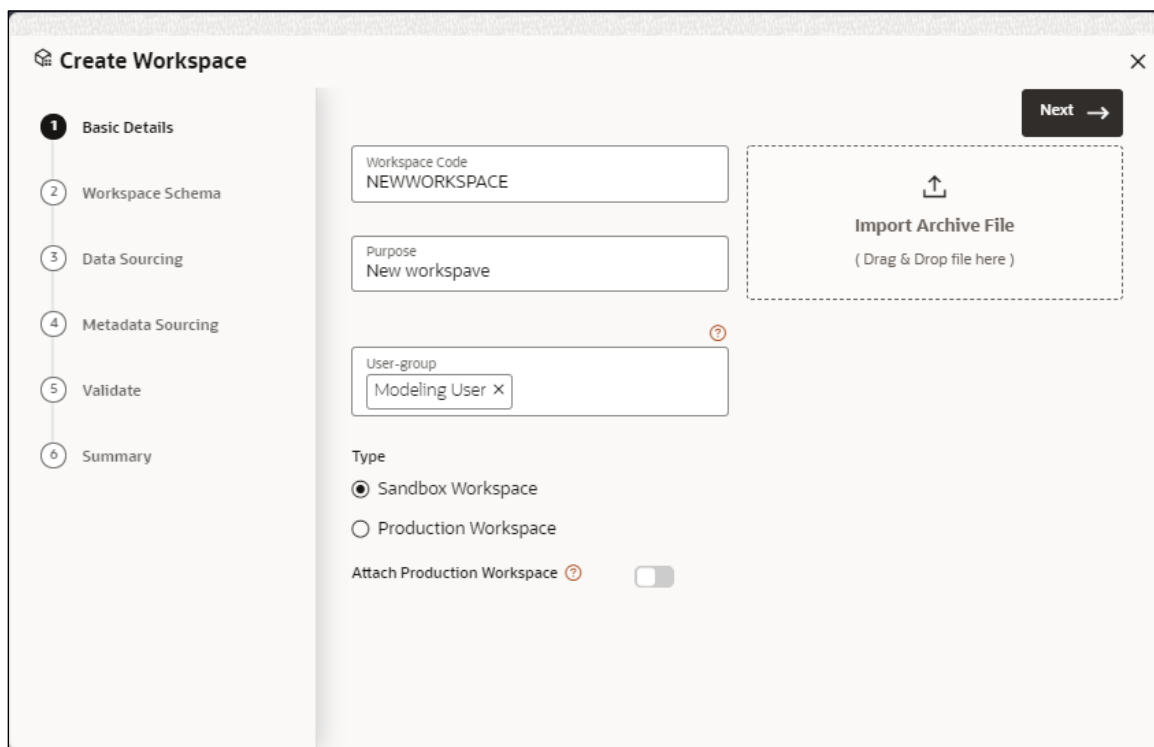
The following steps show the various phases from workspace creation to deployment:

- a. [Configure Basic Details](#)
- b. [Configure Workspace Schema](#)
- c. [Configure Data Sourcing](#)
- d. [Configure Metadata Sourcing](#)
- e. [Validate Workspace](#)
- f. [Display Summary](#)

3.2.1 Configure Basic Details

Enter basic configuration details in this window.

Figure 7: Configure Basic Details



The screenshot shows the 'Create Workspace' window with a progress indicator on the left. The progress indicator has six steps: 1. Basic Details (active), 2. Workspace Schema, 3. Data Sourcing, 4. Metadata Sourcing, 5. Validate, and 6. Summary. The main content area is titled 'Configure Basic Details' and contains the following fields and options:

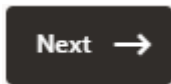
- Workspace Code:** NEWWORKSPACE
- Purpose:** New workspave
- User-group:** Modeling User x
- Type:**
 - Sandbox Workspace
 - Production Workspace
- Attach Production Workspace:**
- Import Archive File:** (Drag & Drop file here)

A 'Next' button is visible in the top right corner of the window.

To configure the basic details for the workspace, follow these steps:

1. Enter the required details in the **Basic Details** pane as shown in the following table.

| Field | Description |
|----------------------------|---|
| Workspace Code | Enter the code of the workspace. This field is limited to 20 characters. |
| Purpose | Enter the purpose of the creation of the Workspace. |
| User-group | Click on this field to display a list of User-group values. Select the required value. <ul style="list-style-type: none"> • Modeling Approver • Modeling Reviewer • Modeling User |
| Type | Select the type of Workspace as Sandbox or Production. UGDOMMAP function should be mapped to the user performing sandbox creation, else create operation will fail. |
| Attached Production Schema | Move the toggle switch to the right to enable this option. Enabling it attaches the production schema, which selects the Workspace being created for automatic model promotion. Based on the selection of the OFSAA Schema, the model is promoted to the environment. |
| Import archive file | Enter the archived file to import for basic details. If you use this feature, the other fields described in the preceding rows are auto-populated. Click on the box to open the file selector dialog and select the required configuration file or drag the file from its directory and drop it in the box. |

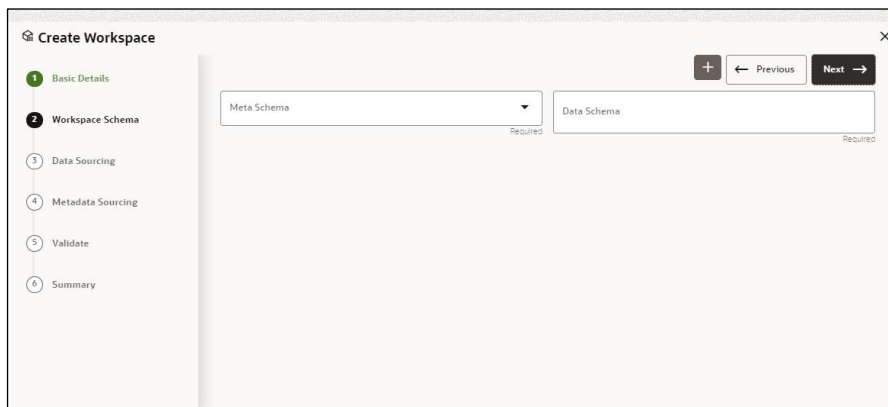


2. Click  to go to the next step.

3.2.2 Configure Workspace Schema

Select the schema operation and enter connection details.

Figure 8: Workspace Schema



To configure the Workspace schema, follow these steps:

1. Select one from the options from the **Meta Source** drop-down list.
 2. You can upload a new data model with the details you provide in the Data Sourcing drop-down list. You can select an existing Schema or add a new Schema.
- **Meta Source:** Every workspace has a schema to store the meta information such as batch ID and so on. This is used for saving all the definitions and metadata related to models.
 - **Data Source:** This is the actual data used for model building.

To add a new Schema, follow these steps:


3. Click Add . The Create Data Source window is displayed.

Figure 9: Create Data Source

4. Enter the required details as shown in the following table.

| Field | Description |
|----------------------|--|
| Database Source Name | Enter the connection URL to the database for the data schema. |
| Description | Enter the description of database connection. |
| Type | Enter the type of the database connection. |
| Wallet Alias | Enter the Wallet Alias. This value should be same as configured using Oracle Wallet. For more information, see the OFS CS Admin Guide. |

5. Click **Create** on Create Data Source window.

6. Click  to go to the next step.

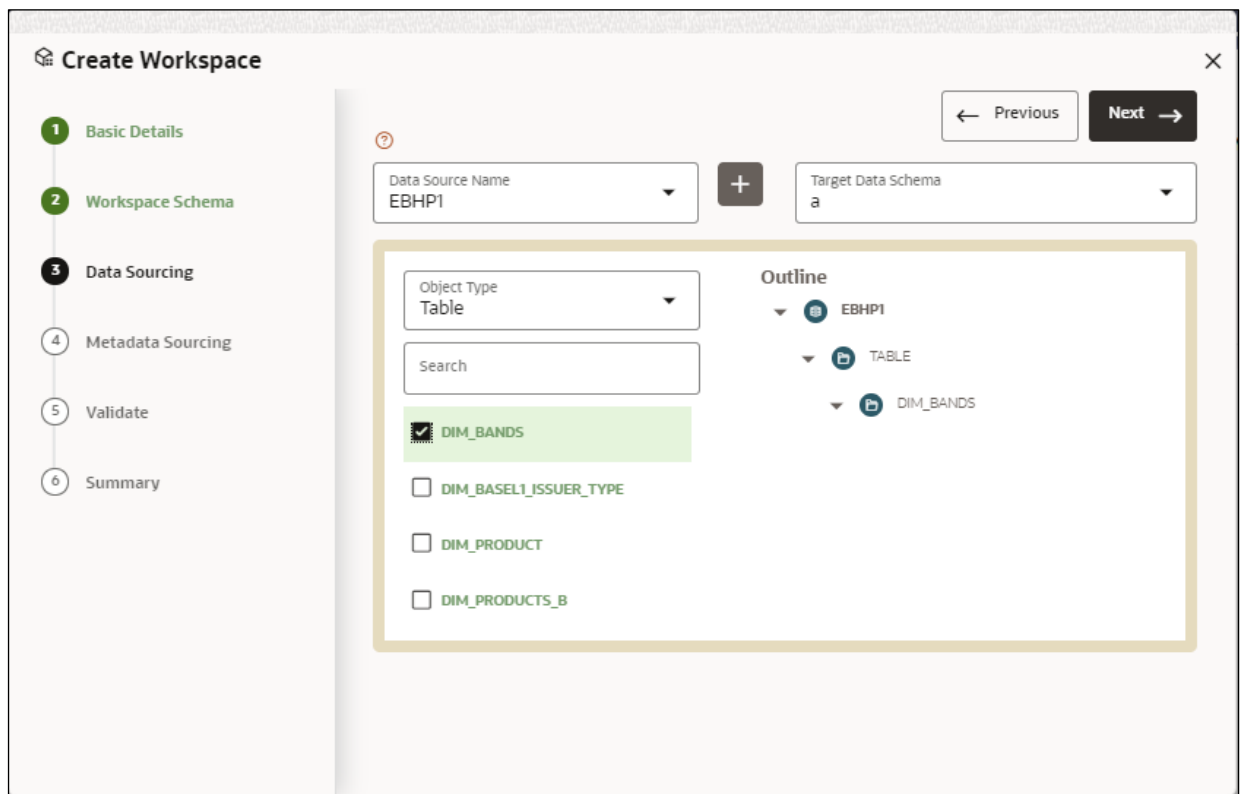
NOTE Click **Test Connection** to check the connection. A success message is displayed.

3.2.3 Configure Data Sourcing

The schema type selected in the previous step requires the definition of database objects to be used for model creation. Enter the details in this window.

NOTE This step does not apply to the prepopulated schema and OFSAA Infodom options in [Workspace Schema](#).

Figure 10: Data Sourcing - External Data Source



To configure Data Sourcing, follow these steps:

1. You can select Data Source from Data Source Name drop-down list or create a new Data Source. To create a new Data Source, see the Configure Workspace Schema section.
2. Select the type of objects to be displayed in the pane that follows the drop-down list. The Object Type drop-down list will be enabled after selecting the Data Source from Data Source Name drop-down list. The following are the options in the drop-down list:
 - Table
 - View
 - Synonym

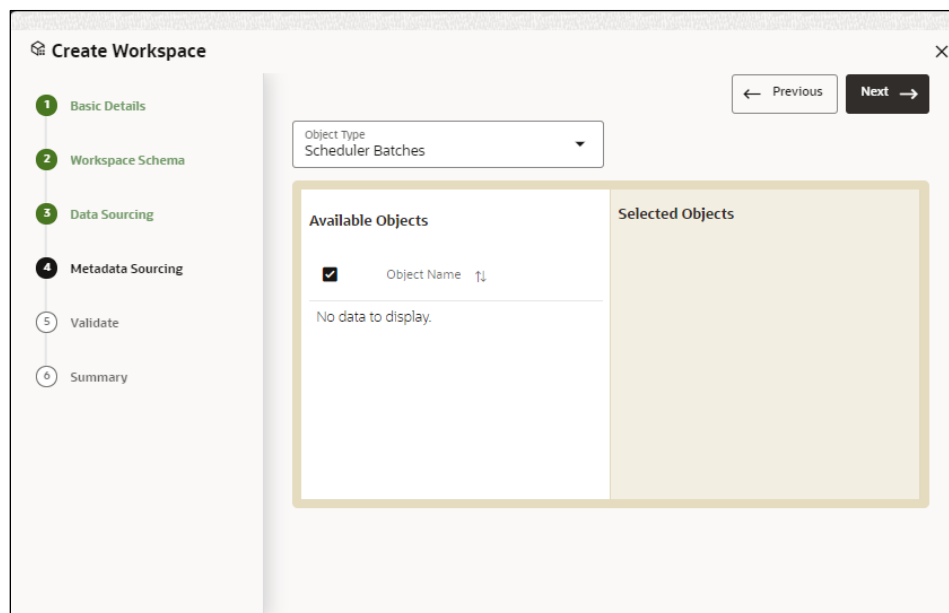
3. Click  to go to the next step.

3.2.4 Configure Metadata Sourcing

The database objects selected in the previous step can be added with metadata for selected objects. Metadata Sourcing is a stage during Workspace provisioning to allow seeding of metadata like scheduler batches at the time of workspace provisioning.

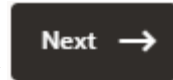
NOTE This step is optional.

Figure 11: Configure Metadata Sourcing



To configure Metadata Sourcing, follow these steps:

1. Select the required schema from the **Object Type (Optional)** drop-down list. The **Available Objects** are displayed in **Selected Objects** pane.



2. Click **Next** to go to the next step.

3.2.5 Validate Workspace

The **Validate** pane displays a preview of the configuration values entered in the previous panes.

Figure 12: Validate Workspace

Create Workspace

1 Basic Details
2 Workspace Schema
3 Data Sourcing
4 Metadata Sourcing
5 **Validate**
6 Summary

← Previous **Finish**

Basic Details

| | | | |
|------------------------------|-----------------|----------------------|--------------------|
| Workspace Code NEW | Purpose test | User-group MDLUSR | Production Infodom |
|------------------------------|-----------------|----------------------|--------------------|

Workspace Schema

| Meta Schema | |
|-------------|----|
| Schema | 12 |
| Data Schema | |
| Schema 1 | a |

Data Sourcing

▶ a

Metadata Sourcing

To validate the Workspace and deploy, follow these steps:

1. Review the details in the **Validate** pane. You can edit the Workspace using Edit.
2. Click **Finish** to creation of the Workspace using **Physicalize Sandbox** option or **Download Configurable Archive**.

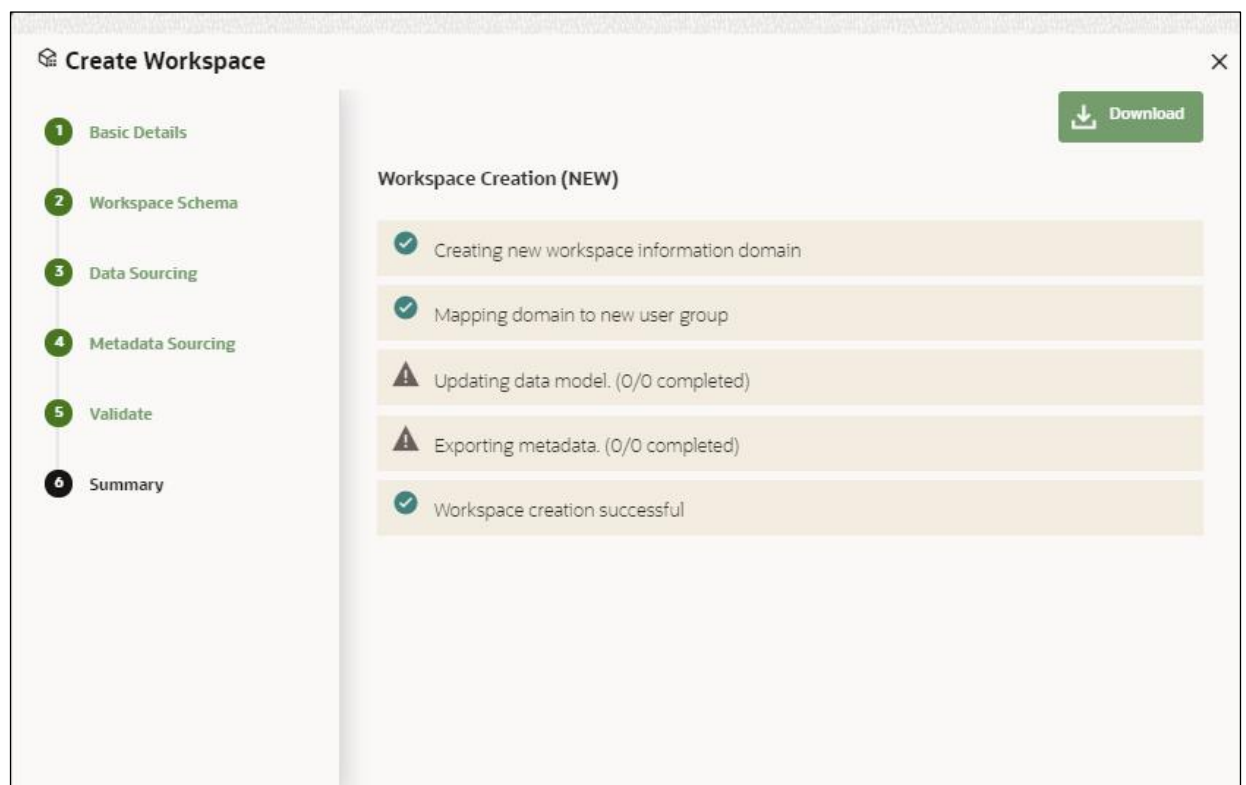
- When you click **Download Configurable Archive**, it exports the metadata information of the workspace in .zip format which can be used later using the Import option.
- When you click **Physicalize Sandbox**, it creates actual workspace.


3. Click  to go to the next step.

3.2.6 Display Summary

The **Summary** pane displays the status of the workspace creation.

Figure 13: Workspace Creation Summary



- Click  to download the deployment report.

3.3 Launch a Workspace

The launching of the Workspace displays the **Workspace** window. The workspace displays a menu for Models and an application configuration and model creation submenu as shown in the following list:

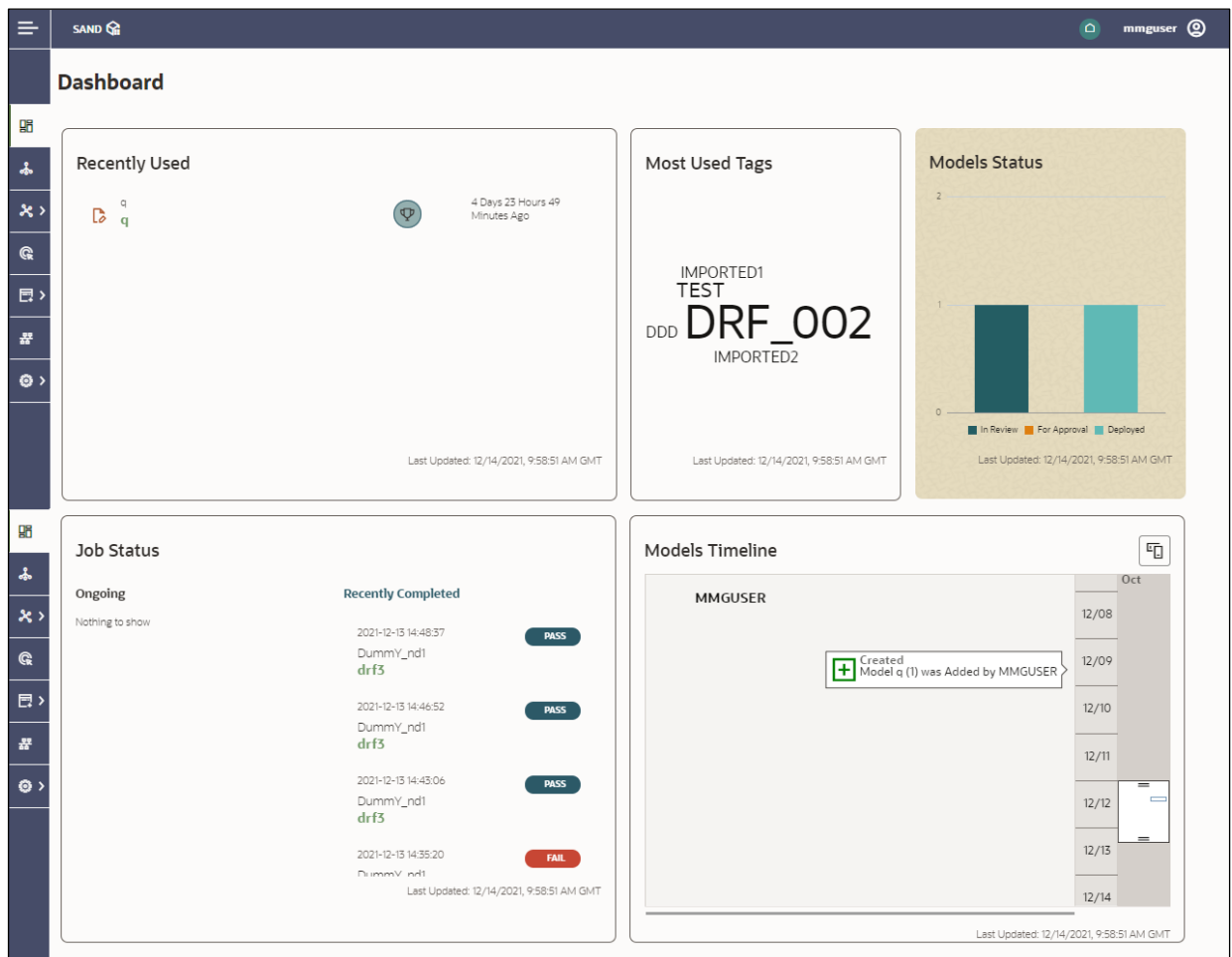
- Dashboard
- Dataset

- Advanced Model Management
- Model Actions
- Scheduler Service
- Model Audit
- Data Studio Options
- Ruleset Details
- Manual Decisioning



1. Navigate to Click Launch next to corresponding Workspace. The Workspace Dashboard is displayed.

Figure 14: Workspace Dashboard



3.4 Populate a Workspace

The workspace is populated with data from the datasets in External sources.

To populate the Workspace, follow these steps:



1. Navigate to the Workspace **Summary** page. The page displays Workspace records in a table.
2. Click Action  next to corresponding Workspace and select **Populate Workspace**  to populate the Workspace with data from a dataset data in the **Populate** Workspace window.

Figure 15: Populate Workspace Window

The following table provides descriptions for the fields in the **Populate** Workspace window.

| Field | Description |
|----------------|------------------------------------|
| Workspace Code | The code of the Workspace. |
| Purpose | The description for the Workspace. |

| Field | Description |
|---------------------------|--|
| Creation Date | The date on which the Workspace was created. |
| Data Source Type | The source of data. The value can be the OFSAA Data Schema or an external data source. |
| Data Filter - Global | Enter the data filter that needs to be applied on all the tables selected for data sourcing. |
| Data Filter - Table level | Provide the data filters individually on the tables here. Note: You can provide multiple table names for the same SQL filter. Global Filters will not be applicable for those tables on which filters have been applied individually. If the same table name is provided in more than one rows here, then filter condition is generated as a conjunction of all the provided filters. |
| Fetch Size | Enter the Fetch size of JDBC properties for data upload |
| Batch Commit Size | Enter the Batch Commit size of JDBC properties for data upload |
| Rejection Threshold | Enter the maximum of number of inserts that may fail for any of the selected tables. You can provide the maximum number of inserts that can fail while loading data to a given table from all the sources. In case of threshold breach, all the inserts into the particular target schema will be rolled back. However, it will continue with populating the next target schema. |
| Write Mode | You can either overwrite the existing data (truncate and insert) or to append to the existing data. You can choose to either overwrite the data or append to the existing data. |

- Click **Populate Workspace** to start the process. Here, you can create the batch using Create Batch, or create and execute using Create and Execute Batch option. On selecting either of these options, a workspace population task gets added to the batch.

NOTE You may require approval from an approver to populate the workspace.

- When you select Create and Execute Batch option, it allows you to create batch and triggers the batch as well.
- When you select 'Create Batch' option, it allows you to prepare the batch and then execute or schedule the batch at a later time through Scheduler Service window.
The Workspace population task execution can be tracked in the 'Monitor Batch' window. Navigate to Scheduler Service and select Define Task.

| Task Parameters | | | | |
|-----------------|-----------------------|-------|----------------------|-------------------------------------|
| Parameter | \$BATCHDATE\$ | Value | Batch Date | <input checked="" type="checkbox"/> |
| Parameter | \$BATCHRUNID\$ | Value | BATCHRUNID | <input checked="" type="checkbox"/> |
| Parameter | Global Filter | Value | <input type="text"/> | <input type="checkbox"/> |
| Parameter | Table Filters | Value | <input type="text"/> | <input type="checkbox"/> |
| Parameter | Additional Parameters | Value | <input type="text"/> | <input type="checkbox"/> |

4. Enter the following parameters for workspace population.

- **Additional Parameters:** Enter the Additional Parameters in following format:

```
{ "fetch_size" :10, "batch_commit_size" :1000,
  "rejection_threshold" : "UNLIMITED", "write_mode" : "OVERWRITE" }
```

- **Global Filter**

Provided input will be applied as a data filter on all the tables selected for data sourcing.

- **Table Filter**

You can provide data filters individually on the tables here. You must provide multiple table names for the same SQL filter. Global Filters will not be applicable for those tables on which filters have been applied individually. In case the same table name is provided in more than one rows here, the filter condition will be generated as a conjunction of all the provided filters.

Enter the Table filters in following format:

```
{ "id":1, "filter": "<filter condition>", "tables": ["TABLE1",
  "TABLE2"] }, { "id":2, "filter": "<filter condition>", "tables": ["TABLE2"] }
```

Note: You can run workspace population for a given workspace any number of times. New tables may be added to the definition. Any new table added to the definition, that is not present in the target schema will be physicalized on update of the workspace. Also, user can add new sources if required.

Any table that is deselected from the data sourcing definition will **NOT** be dropped.

3.5 Edit a Workspace

To edit a workspace, follow these steps:

1. Navigate to **Workspace Management** to display the **Workspace Summary** page. The page displays workspace records in a table.



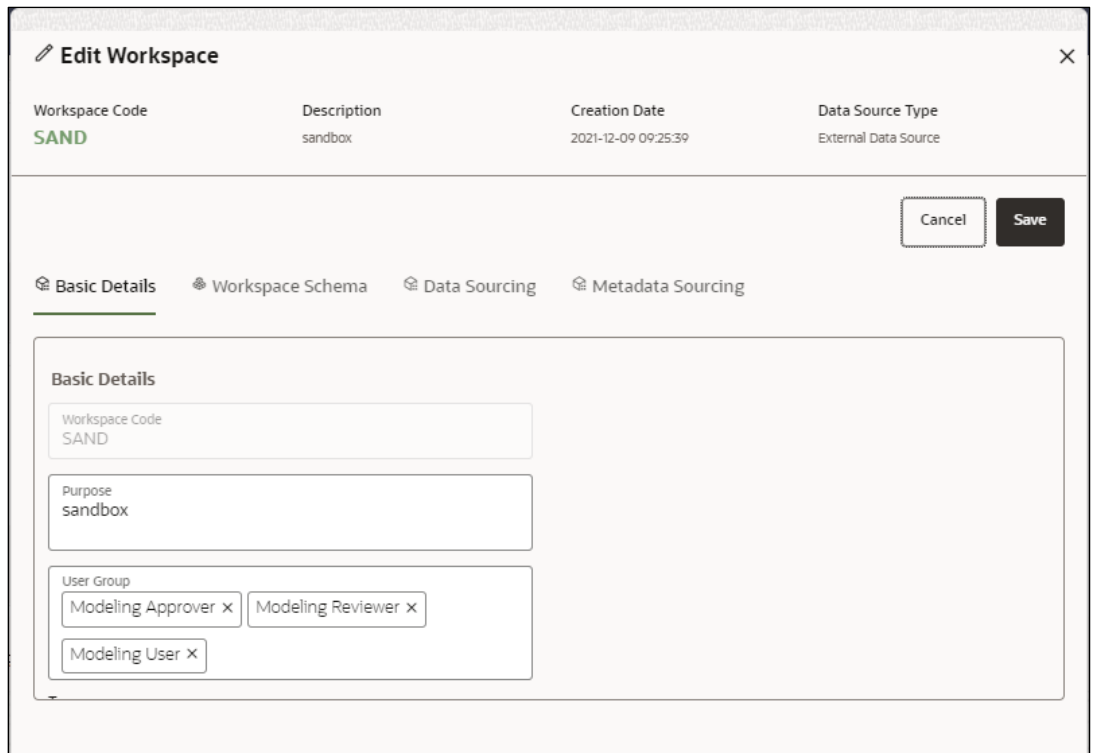
2. Click Action  next to corresponding workspace and select Edit Workspace  to edit the workspace.

Figure 16: Edit workspace Window



The following table provides descriptions for the fields in the **Edit Workspace** window.

| Field | Description |
|-------------------|--|
| Workspace Code | The code of the Workspace. |
| Description | The description for the Workspace. |
| Creation Date | The date on which the Workspace was created. |
| Data Source Type | The data source of Workspace |
| Basic Details tab | To edit the basic details of workspace. Note: You cannot edit workspace Name. |
| Workspace Schema | To edit the Workspace Schema details of workspace. You cannot remove the previously added Data Schema. |
| Data Sourcing | To edit the Data Sourcing details of workspace. |
| Meta Sourcing | To edit the Meta Sourcing details of workspace. |

3. Click **Save**.

3.6 Delete a Workspace

To delete a Workspace, follow these steps:



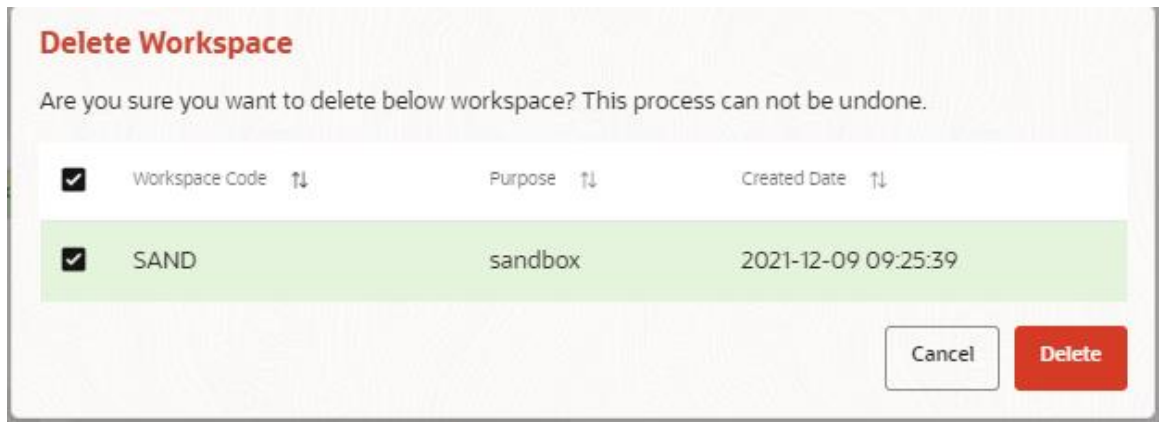
1. Navigate to **Workspace Management** to display the **Workspace Summary** page. The page displays workspace records in a table.
2. Click Action  next to corresponding Workspace and select Delete Workspace  to delete the workspace.

Figure 17: Delete Workspace Window



The following table provides descriptions for the fields in the **Delete Workspace** window.

| Field | Description |
|----------------|--|
| Workspace Name | The name of the workspace. |
| Purpose | The description for the workspace. |
| Creation Date | The date on which the workspace was created. |

3. Click **Delete**. Click **OK** on the confirmation dialog box to confirm or click **Cancel** to cancel.

NOTE You may require approval from an approver to delete a workspace.

3.7 Managing Data Sources

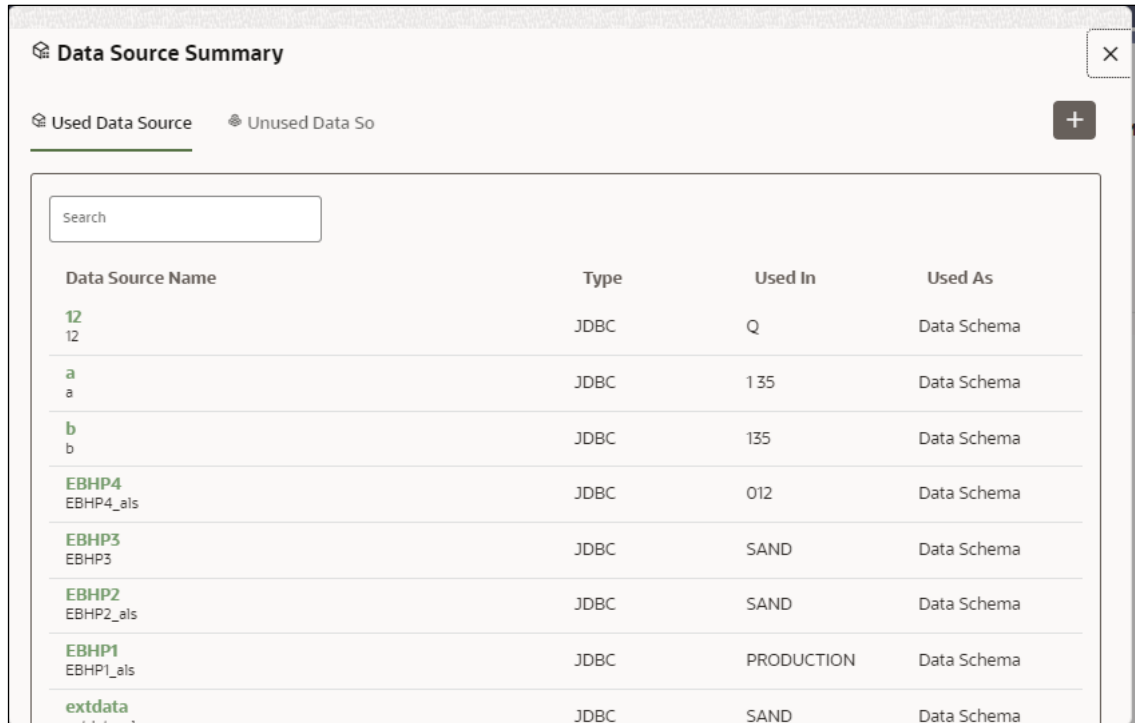
This feature allows you to manage the Data Schemas registered with MMG. The Data Source Summary window shows the list of Data schemas registered with MMG. These

Data schemas can be used either for workspace or for sourcing data. Click Managed Data



Sources to navigate to Data Source Summary window.

This window also allows you to manage these registered external sources.



The Data Source Summary is divided into two sections: Used Data Sources and Unused

Data Sources. Click next to corresponding Workspace and select View Data Source

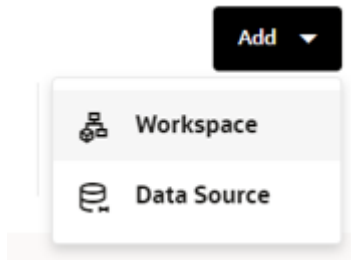


to view the Data Source details.

- **Used Data Sources:**
This shows the list of Data Sources registered with any workspace. Here, you can only view the Data Source details.
- **Unused Data Sources:**
This shows the list of Data Sources those are not registered with any workspace. Here, you can only view, edit, or delete the Data Source details.

To add a Data Source from Workspace Summary window, follow these steps:

1. Navigate to Workspace Summary window.
2. Click Add from the Top-right corner and select Data Source.




The Create Data Source window is displayed.

To add a Data Source from Data Source Summary window, follow these steps:

3. Navigate to Workspace Summary window.



4. Click Managed Data Sources to navigate to Data Source

Summary window and click Add .

For more information, see the [Configure Data Sourcing](#) section.

4 Using Model Management

Model management allows you to create and publish models based on the workspaces created from datasets in the database. The published models are then deployed in production to be consumed by users. Modelers create models by using the Notebooks in the Data Studio. The Notebooks are used to create training models and the iterations of comparison between various models lead to the elimination of undesired models and filters a few robust ones that can be considered for deployment in production. Modelers then use their better judgement to consolidate their choice and fix on one model - the champion model. The champion model is also called the scoring model or the actual model in this document.

Topics:

- [Advanced Model Management](#)
- [Model Audit](#)
- [Model Actions](#)

Topics:

- [Prerequisites](#)
- [Access the Model Management Window](#)
- [Create, Review, Approve, and Deploy a Model](#)
- [Execute Models using Scheduler Service](#)
- [Import a Workspace Model Data into a New Model](#)
- [Use the Model Audit Window](#)
- [Use Scope](#)
- [Use View Models](#)
- [Edit Models](#)
- [Delete Objectives and Models](#)

4.1 Prerequisites

The prerequisites for model management are as follows:

- To create a model, your user profile must be mapped to the Modeler Group. For more information, see the [Mapping User Groups](#) section.
- To create a model, a workspace must be deployed. See the [Create a Workspace](#) Section for more information.
- To approve and deploy a model, your user profile must be mapped to the Modeling Administrator Group. For more information, see the [Mapping User Groups](#) section.

4.2 Access the Workspace Dashboard Window

The Workspace Dashboard window allows you to view the models of launched workspace. The Workspace Dashboard shows the following details of a launched workspace:

- Recently Used model
- Most Used Tags models
- Status of models
- Job Status of models
- Timeline of models

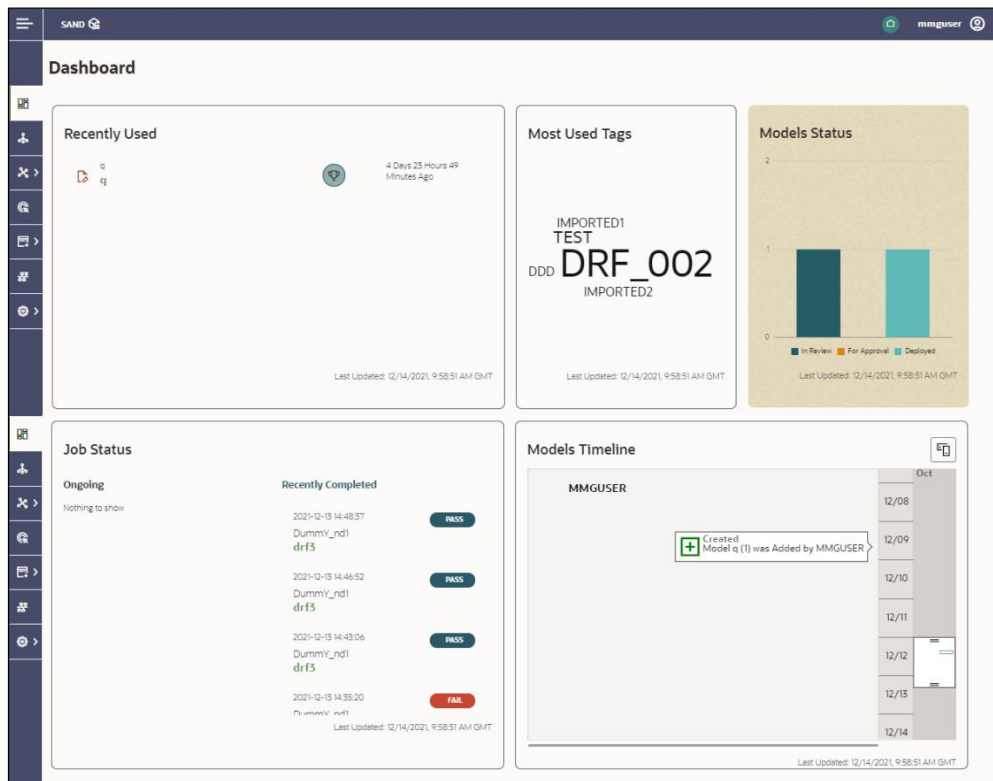
To access the Dashboard window, follow these steps:


1. Navigate to **Workspace Summary** page. The page displays workspace records in a table.



2. Click next to corresponding Workspace to Launch Workspace, The MMG **Dashboard** window is displayed with application configuration and model creation menu.

Figure 18: Workspace Dashboard



Click  to navigate back to Workspace Summary window.


4.3 Access the Advance Model Management Window

The Advance Model Management window allows you to create and publish models.

To access the Advance Model Management window, follow these steps:

1. Navigate to **Workspace Summary** page. The page displays workspace records in a table.



2. Click  next to corresponding Workspace to Launch Workspace, The MMG **Dashboard** window is displayed with application configuration and model creation menu.




















3. Click **Advanced Model Management**  to display the **Model Management** window. The window displays folders that contain models and model records in a table.

Figure 19: Model Management Page


| <input type="checkbox"/> | Objective Name | ID | |
|--------------------------|---|----------------|---|
| <input type="checkbox"/> |  12 | 1639466177775 |  |
| <input type="checkbox"/> |  123 | 1639127109040 |  |
| <input type="checkbox"/> |  Dummy_nd1 Dummy_nd1 Desc | 1639401016285 |   |
| <input type="checkbox"/> |  import | 1639124809016 |  |
| <input type="checkbox"/> |  nilkobj | 16394669310652 | |
| <input type="checkbox"/> |  obj2 | 1639061178990 |    |

4. Navigate to Model.







Figure 20: Draft Model




| <input type="checkbox"/> | Objective Name | ID | Owner | Tags |
|--------------------------|--|---------------|---------|---|
| <input type="checkbox"/> |  clob | 1639487690529 | AAAUSER |  |

ver 1 14-DEC-2021 01:15:21 PM

clob 



The following table provides descriptions for the fields and icons on the **Model Management** page.


| Field or Icon | Description |
|-------------------------------------|---|
| Model Management Page Header | The header that follows the global header in the application. |
| Breadcrumbs | Indicates the position of the current page in the Model Management hierarchy. Use breadcrumbs locator links to navigate back to higher levels in the hierarchy after you have drilled-down through levels of functions.  |
| Requester | Displays that the logged-in user has the Requester privileges when the status is green.  You can create a model. However, to approve and publish, the model must be reviewed by a user with reviewer privileges and approved by a user with approver privileges. |
| Reviewer | Displays that the logged-in user has the Reviewer privileges when the status is green.  You can review models. However, to approve and publish, the model must be approved by a user with approver privileges. |
| Approver | Displays that the logged-in user has the Approver privileges when the status is green.  You can approve models that are created and reviewed. |
| Model Management Page Table | The table displays the objective and model records on the page. |
| Objective and Model | Displays the name of the Objective  |
| Description | Displays the description for the Objective or Model. |
| Created User | Displays the user ID of the user who created the Model. This information does not display for an Objective. |
| Tags | Displays the tags associated with the Objective or Model.  This information does not display for an Objective. |

| Field or Icon | Description |
|------------------------------|---|
| Edit Model | Select  to edit the models in Data Studio. See the Edit Models Section for more information. This information does not display for an Objective. |
| Delete Model | Select  to delete the model from the Confirmation dialog box. Click OK to process or click Cancel to cancel. This information does not display for an Objective. |
| Create Objectives and Models | Select Add  to display a list with the following options: <ul style="list-style-type: none"> • Draft • Objective To create Models, select Draft. To create Objectives, select Objective. See the Create Objective (Folders) and Create Draft Models sections for more information. However, if you want to know about the cycle of model creation, see the Create, Review, Approve, and Deploy a Model Section. |

4.4 Create, Review, Approve, and Deploy a Model

Model creation and deployment undergoes a workflow of Model Governance where the following types of users in the system have privileges that restrict the activities they can do in the model creation and deployment workflow.

| Field or Icon | Description |
|---|--|
| Requester  | You can create a model. However, to approve and publish, the model must be reviewed by a user with reviewer privileges and approved by a user with approver privileges. <ul style="list-style-type: none"> • Model Acceptance • Make Champion – Local NOTE: User Groups must be mapped to the MDLDEPLOY role to access Requester functions. |
| Reviewer  | You can review models. However, to approve and publish, the model must be approved by a user with approver privileges. <ul style="list-style-type: none"> • Model Acceptance • Model Acceptance + Promote to Production • Promote to Production NOTE: User Groups must be mapped to the MDLREVIEW role to access Reviewer functions. |

| Field or Icon | Description |
|---|---|
|  Approver | <p>You can approve models that are created and reviewed. You can then promote to production and make the model the champion in the production.</p> <ul style="list-style-type: none"> Promote to Production Make Champion – Global <p>NOTE: User Groups must be mapped to the MDLAUTH role to access Approver functions.</p> |

The following sections in this topic provide details for the cycle of creation of a model, review, approval, and deployment:

- [Create Objective \(Folders\)](#)
- [Create Draft Models Publish Models \(Scoring\)](#)
- [Show Model Versions](#)
- [Compare Models](#)
- [Understand Model Governance](#)
- [Request Model Acceptance](#)
- [Review Models and Move to Approve or Reject](#)
- [Approve Models and Promote to Production](#)
- [Deploy Models in Production and Make it a Global Champion](#)

4.4.1 Create Objective (Folders)

Create folders called Objectives within which you can create Models.

To create an Objective, follow these steps:



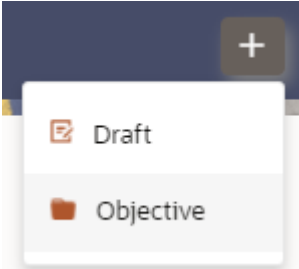
- Click Launch Workspace  next to corresponding Workspace to Launch Workspace to display the **MMG Dashboard** window with application configuration and model creation menu.
- Click **Advanced Model Management**  to display the **Model Management** window. The window displays folders that contain models and model records in a table.

Figure 21: Create Model Objectives

| <input type="checkbox"/> | Objective Name | ID | |
|--------------------------|-----------------------------|---------------|--|
| <input type="checkbox"/> | 12 | 1639466177775 | |
| <input type="checkbox"/> | 123 | 1639127109040 | |
| <input type="checkbox"/> | Dummy_nd1 Dummy_nd1 Desc | 1639401915285 | |
| <input type="checkbox"/> | import | 1639124809016 | |
| <input type="checkbox"/> | nikobj | 1639469310652 | |
| <input type="checkbox"/> | obj2 | 1639061178990 | |

3. Click **Add**  and select **Objective** from the list to display the **Objective Details** dialog box.

Figure 22: Select Objective from Add



4. Enter details in Objective **Name** and **Description** fields in the **Add Objective** dialog box.

Figure 23: Objective Details Dialog box

Add Objective ✕

Objective Name Required

Description

5. Click **Save**.

4.4.2 Create Draft Models

Create Models that are classified as draft models. These models will be reviewed before being sent for Scoring.

To create a draft Model, follow these steps:




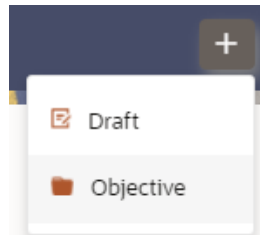
1. Click **Launch Workspace**  next to corresponding Workspace to Launch Workspace to display the **MMG Dashboard** window with application configuration and model creation menu.
2. Click **Advanced Model Management**  to display the **Model Management** window. The window displays folders that contain models and model records in a table.
3. Click **Add**  and select **Draft** from the list to display the **Add Draft** dialog box.

Figure 24: Create Model



4. **Create New Model** is the default setting in the **Model Details** dialog box. Drag the toggle button to select **Import Dump**. Use Create New Model to start from a blank Notebook in Compliance Studio. Import Dump lets you drag and drop an existing file with model data and modify it. To import a model data dump from another model, see the [Import a Workspace Model Data into a New Model](#) section. You can also create a draft under Objective (Folder) also. Click an Objective to open it.

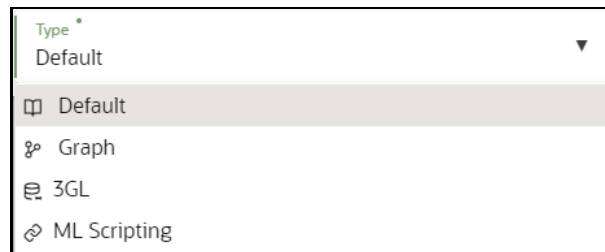
To create a new model, follow these steps:

- a. Enter details for Draft **Name** and **Description**.

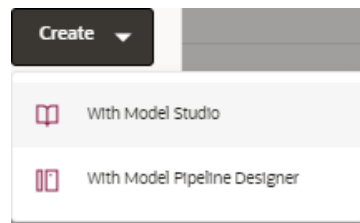
Figure 25: Model Details - Create New Model

- b. Enter a tag and press the **Enter** key to add it in the **Tags** field.
- c. Select **Default** as the type of scripting language to create the Model in the Data Studio from the options available.

Figure 26: Create New Model - Scripting Language Type



- d. Click **CREATE** to display to launch the Data Studio or Data Pipeline for model creation.



- e. For more details, see the [Create Paragraphs in Model Studio Notebooks](#) and Create Paragraphs in Data Pipeline sections.

4.4.2.1 Create Paragraphs in Model Studio Notebooks

After creating the Models in the Workspace, create Paragraphs in the Model Studio window. To create Paragraphs, you must have a working knowledge of scripting and Python.

The following types of paragraph creation are supported for model creation:


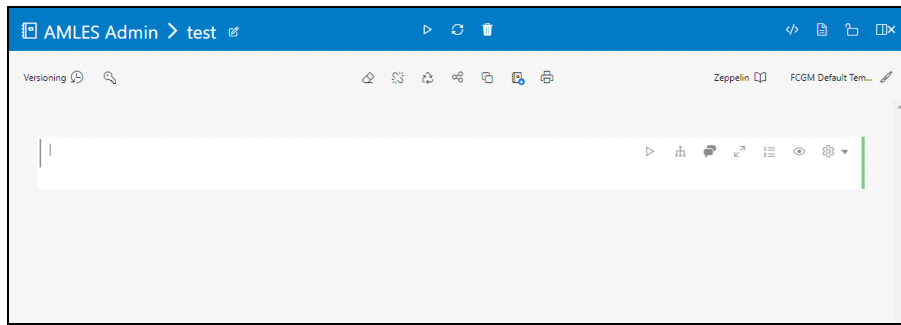

- Add empty Paragraph:  To create Model building scripts in Python.

Figure 27: Create Draft Models in Model Studio Notebooks



To create Paragraphs in the Model Studio Notebooks, follow these steps:


1. Open Model Studio in OFS MMG. Follow the instructions in the [Create Draft Models \(Draft\)](#) section to open it.


2. Click  in Model Studio to add a Paragraph in the Notebook and add the scripting instruction to fetch connection objects in the following format. This creates a cx_oracle based connection object to the datadom of the infodom being passed:

```
conn = mmg.getConnection(<infodom name>)
```

NOTE


The fetch connection objects function works only with %Python interpreters and requires an Oracle client installed on the server that runs Model Studio.

Click  to run the script and display the Notebook ID and the Model Objective ID.

3. Click  in Model Studio to add a Paragraph in the Notebook and add in the following format to fetch current Notebook and Model Objective details:

- Notebook Id: **currentNotebookId**
- Model Objective: **objectiveld**


Click  to run the script and display the Notebook ID and the Model Objective ID.

4. Click  in Model Studio to add a Paragraph in the Notebook and fetch the runtime parameters supported in Model Studio runtime as shown in the following example. This is available for all the interpreters.

For example, enter as follows:

```
%python
```

```
print('threshold value is : ${[threshold]}')
```

Click  to run the script and display.

After the Draft Models are created, publish the Notebooks to create Scoring Models. See the [Publish Models \(Scoring\)](#) section for more information.

4.4.2.2 Create Paragraphs using Pipeline Designer

After creating the Models in the Workspace, create Paragraphs using the Pipeline Designer window.

Pipeline Designer enables you to design the paragraph using widgets (graphical representation) instead of using python codes. In addition, if you can add new paragraphs in Data Studio, the added paragraphs are displayed in the widget format. Similarly, if you create a Notebook using Pipeline Designer, it can be opened for editing in Data Studio using Studio Notebook option.

This helps the Financial Institutes and Banks in following ways:

- Visualization of the data (for example, based on data tasks)
- View the dependency
- Modify the flow of execution or execution order
- Easy for Auditing purpose

You can execute the flow based on requirement. For example, if you have created one flow and want to execute a flow of training paragraphs out of that and other flow as experimental way, then you can modify the using the Training and Experimentation link types. One flow can be break into 2-3 flows for execution purpose.

When a model is edited using the Pipeline Designer/Data Studio, and executed, then a new version of published model is displayed in Model Summary page.

NOTE

When you add a new paragraph from studio and opened the same in pipeline designer, it gets linked to multiple paragraphs.

For example, you have paragraphs P1, P2 and P3 in the same order in a Notebook. It shows in Pipeline Designer canvas as P1 > P3 > P2.

If you add two new paragraphs P1a and P1b in the Notebook after the P1 and open the canvas, this gets reflected as the following:

1. P1 -> P1a -> P1b -> P2
2. P1 -> P3 -> P2

Topics:

- Pipeline Canvas
- Execution Summary
- Notebook

4.4.2.2.1 Pipeline Canvas

You can perform following functions on Pipeline Canvas:

- Creating a Pipeline
- Creating Script Template
- Viewing a Pipeline
- Using Link Connector Nodes
- Execution of Pipeline

Creating a Pipeline

To create a paragraph using pipeline, follow these steps:


1. Navigate to the **Pipeline Designer** page. For more information, see the Creating Draft Models section.
2. Drag and drop the Paragraph widget from the widgets pane in the upper-left corner of the designer pane.
3. Hover the mouse over the Paragraph widget and click  to add Basic Details.

Figure 28: Pipeline Designer

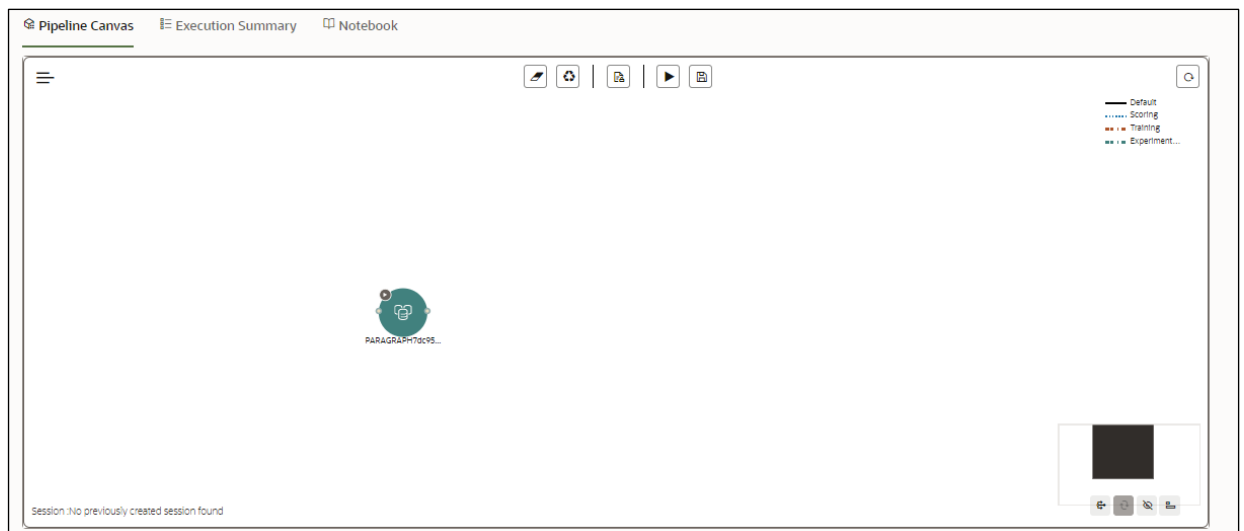



Figure 29: Basic Details for Paragraph

The screenshot shows a dialog box titled "PARAGRAPH5950167" with a close button (X) in the top right corner. The dialog is divided into a "Basic Details" section. This section contains four fields: "Activity Name" with an asterisk indicating it is required, "Description", "Task Type" with a dropdown menu currently showing "Default", and "Track Output" with a toggle switch that is currently turned off. At the bottom of the dialog, there are two buttons: "Cancel" and "Save".

4. Provide details as described in the following table:

| Field | Description |
|---------------|---|
| Activity Name | Enter the Activity Name |
| Description | Enter the description of Activity |
| Task Type | Select the task type. For example, Model Training, Data Analysis and so on. You can also search the task type. |
| Track Output | If this option is selected for any paragraph, then during the model comparison the paragraph details are displayed. |
| Script | Shows the script. |





You can perform the following functions on Pipeline Canvas window:

- Clear Execution Details: Clears the execution details.
- Re-initialize session: Allows you open a new session.
- Studio Notebook: Allows you to view the paragraphs in Studio application.
- Publish: Allows publishing the Notebook.
- Save: Allows saving the Notebook.
- Delete: Click to Delete  icon to delete the current working version. If this is first draft of Model, it will delete all the dependent published version in the Sandbox. If the Model is not first version, then it will delete only the current working version.

- **Download:** Use Download to download the current working version in opened in canvas
- **Execute:** Allows to execute the Notebook. For more information, see Executing a Pipeline

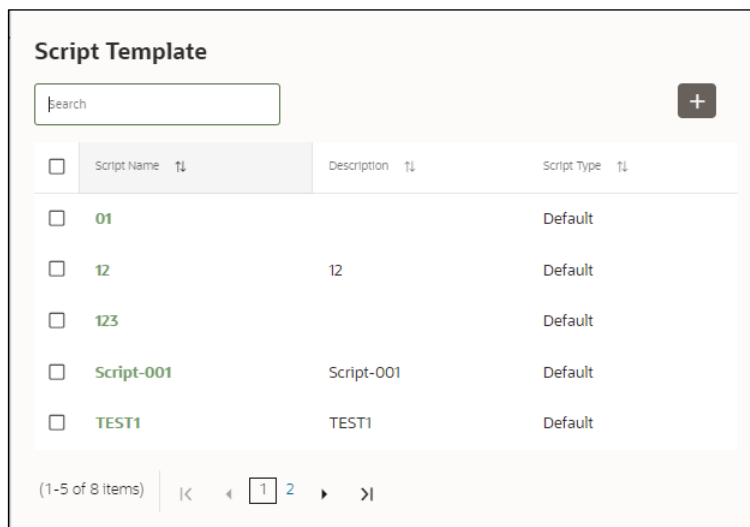
Viewing a Pipeline

The Pipeline canvas window allows you to view the Pipeline using following options:


- **Auto-align** : Arrange all the widgets in vertical order. After saving, the reverting option will not work.
- **Revert-align** : Revert all the widgets if they are Auto-aligned.
- **Hide/Show Overview** : Shows or Hides the overview of widgets.
- **Show Full Labels** : Shows the full name of activity. By default, it shows only 14 characters of label name.


Creating Script

The Script Template window allows you to manage scripts. These scripts can be called for paragraph.



To add a script, follow these steps:

1. Click Tasks  to navigate to Script Template.

2. Click Add  in Script Template window.
3. Enter the following details:

| Field | Description |
|----------------|--|
| Script Name | Enter the Script Name |
| Description | Enter the description of Script |
| Task Type | Select the task type. For example, Model Training, Data Analysis and so on. You can also search the task type. |
| Script Content | Enter Python script |

Script Name *

Required

Description

Task Type


Script Content


```
%python print('Hello World')
```

Using Link Connector Nodes

You can use a dummy node that helps to service connecting functions. If a paragraph in studio got deleted, this type of widget will be placed instead of the paragraph widget in pipeline canvas Node name for deleted node 'Connector'. This helps if the links are not broken. You can drag and drop this node, but will not be associated with any paragraph. If required, you can delete it and provide name and description for it.

To use Link connector nodes, follow these steps:

1. Click Tasks  to navigate to Script Template.

2. Select Link Connector and click . This is a dummy node with no paragraph is created/associated on node save. During execution, this is used in to execute API, but will not get executed. It behaves like non-physicalised paragraph widget on execute.
This node can be used as a dummy start node or connector node.

Executing a Notebook

The Execute icon on Pipeline Canvas allows us to execute the notebook.

The following link types are available in the Pipeline Designer:

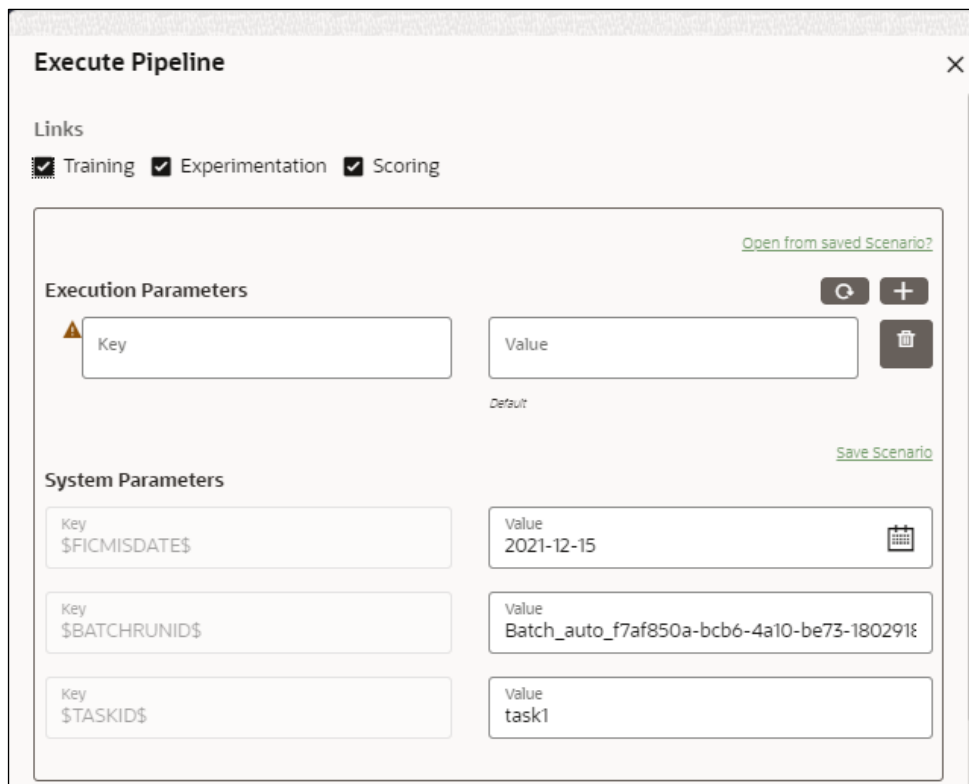
- Default
- Scoring
- Training
- Experimentation

Note: When a model gets published from Model summary page, the Link types configured in Pipeline Designer are set to Default link type.

To execute the notebook, follow these steps:

1. Click Execute to view Execute Pipeline window.

Figure 30: Execute Pipeline




Execute Pipeline

Links

Training Experimentation Scoring

[Open from saved Scenario?](#)

Execution Parameters

| Key | Value |
|---|-------|
|  Key | Value |

Default

System Parameters

| Key | Value |
|-----------------------|---|
| Key \$FICMISDATE\$ | Value 2021-12-15 |
| Key \$BATCHRUNID\$ | Value Batch_auto_f7af850a-bcb6-4a10-be73-180291... |
| Key \$TASKID\$ | Value task1 |

2. Execution parameters are the parameters defined in the notebook required for execution. Select the flow, which you want to execute Scoring, Training, and Experimentation. It displays all the keys defined for all the paragraphs in the notebook with a placeholder for providing the values.
3. Enter the execution Key and Value.

You can also use Runtime parameters for execution. This runtime parameter must be defined in Notebook. If this is defined, you can enter execution value during the process execution.

For more information, see [Create Paragraphs in Model Studio Notebooks](#) section.

The System Parameters window also shows the execution ID, execution Date, and execution Batch. These are required for executing all the paragraphs along with other parameters. It also shows from where the parameter comes from as a subscript.



- **Scenario Creation:** Scenarios are the set of parameters with a specific value required for an instance of execution. It consists Key and Value. You can save the parameters set that can be used for one execution instance and reuse it for the next execution. Each scenario consists of parameters with a specific value to each parameters. Parameters containing no value will not be taken. Each set is identified with a unique code for each objective. While saving the parameter, you have to provide a code for identifying the scenario and description which is not mandatory.



You can save Key Value parameter set using the Save Scenario option. To Save Scenario, enter the Threshold Value and Description in the Scenario window.

- **Importing Scenario:** These saved scenarios can be imported during the execution. It will replace the values of the parameters from the chosen scenario.

To import scenario, follow these steps:

- i. Click "Open from saved scenario". The Threshold Code window is displayed.
- ii. Select the scenarios from the available threshold code. You can import multiple scenarios in the same execution instance. In that case, if there are any common keys, value will be replaced with that from the latest scenario imported.

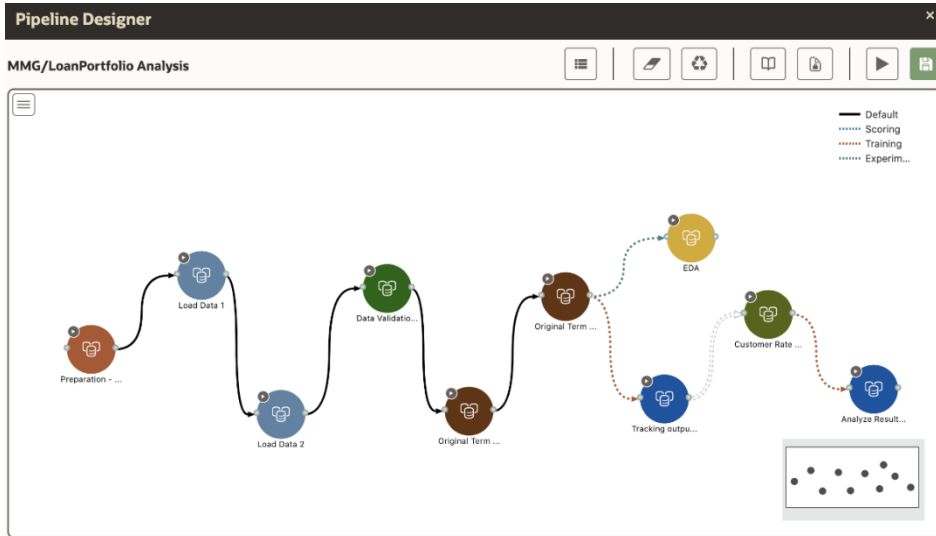
4. You can add new parameters using **Add** . Note: If the parameter is not defined in the notebook, it will not be used for the execution.
5. Execution is performed based on selected link types. It filters out all the not required/unused parameters. And all the unused parameters for the current execution are displayed with a warning . To view the only required parameters, click **Show only required** link.

6. Click Reset  to reset the entered data.
7. Click Delete  to delete the entered Key and Value.

Example:

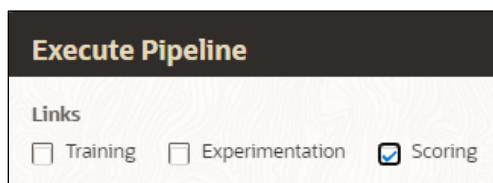
For example, refer to below Figure.

Figure 31: Example of Pipeline Designer



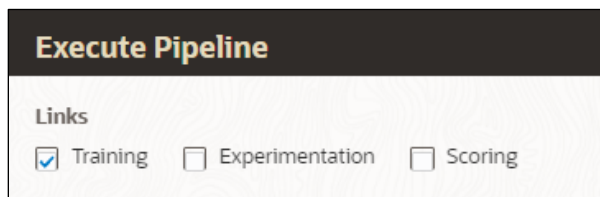
- Here, if you want to execute this Notebook for scoring purpose, then the flow will be executed till EDA paragraph with default paragraphs. To perform this, Click Execute Notebook and select Links as Scoring.

Figure 32: Execute Pipeline



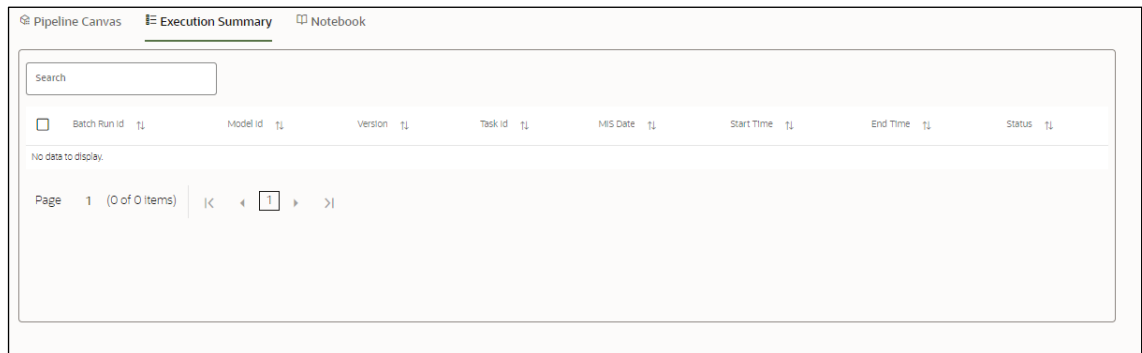
- Similarly, if you want to execute this Notebook for training purpose, then the flow will be executed till Analyze Result paragraph with default paragraphs. To perform this, Click Execute Notebook and select Links as Training.

Figure 33: Execute Pipeline



4.4.2.2 Execution Summary


This section of Pipeline Designer shows the summary of executed pipelines.



Comparing Execution

The Compare option allows you to compare the two executions.

To compare, follow these steps:

1. Navigate to Execution Summary window.
2. Select the executions using the corresponding check-boxes.
3. Click Compare . The Execution Comparison window is displayed.

4.4.3 Publish Models (Scoring)

After creating the Draft Models, publish the Notebooks, which have the Model script.

To create a Scoring Model, follow these steps:



1. Create a Draft Model. See the [Create Draft Models](#) section for more information.
2. Click  next to corresponding Draft Model and select Publish Data Studio  to open Open Model window.

Figure 34: Publish Model

3. Enter the details as shown in the following table.



| Field or Icon | Description |
|-------------------|--|
| Model Name | The field displays the name of the Model. Modify the name if required. |
| Model Description | The field displays the description for the Model. Enter or modify the description if required. |
| Technique | Enter the registered technique to use. |
| Run Version | Select a rub version. |
| Variable Mapping | The table displays the OFSAA variables and datasets used in the creation of the Training Model. |
| Script | The table displays the Paragraphs created in the Training Model. Select the Paragraphs that you want to use to create the Scoring Model. Track Output - Select this to track the output of the paragraph. |

4. Click **Publish**.

4.4.4 View Model Details

You can view model information for deployed models, models that require approval, and so on.

To view model details, follow these steps:

1. Click **Launch Workspace**  next to corresponding Workspace to Launch Workspace to display the **MMG Dashboard** window with application configuration and model creation menu.
2. Click **Advanced Model Management**  to display the **Model Management** window. The window displays folders that contain models and model records in a table.







- The  icon indicates that Model 1 is the champion
3. Hover over the model records to view the various icons.

Figure 35: Mouse over the Model





The icon actions are listed in the following:

- a.  Download Model Data. See the [Import a Workspace Model Data into a New Model](#) section for more details.
- b.  Open in Pipeline Designer. See the Create Paragraphs using Pipeline Designer section for more details.
- c.  Model Detail Comparison - Opens the model comparison window. By default, compares with the Champion model if available, or with a model selected by you. See the [Compare Models](#) section for more details.
- d.  Scope Details - Opens the details for the scope of the model in OFS MMG. See the [Use Scope](#) section for more details.
- e.  Delete Model. See the [Delete Objectives and Models](#) section for more details.

4.4.5 Model Detail Comparison

Model Details Comparison that exist within an objective and review the attributes to promote or dissociate a deployed model.

To compare the model details, follow these steps:

1. Click **Launch Workspace**  next to corresponding Workspace to Launch Workspace to display the **MMG Dashboard** window with application configuration and model creation menu.
2. Click **Advanced Model Management**  to display the **Model Management** window. The window displays folders that contain models and model records in a table.



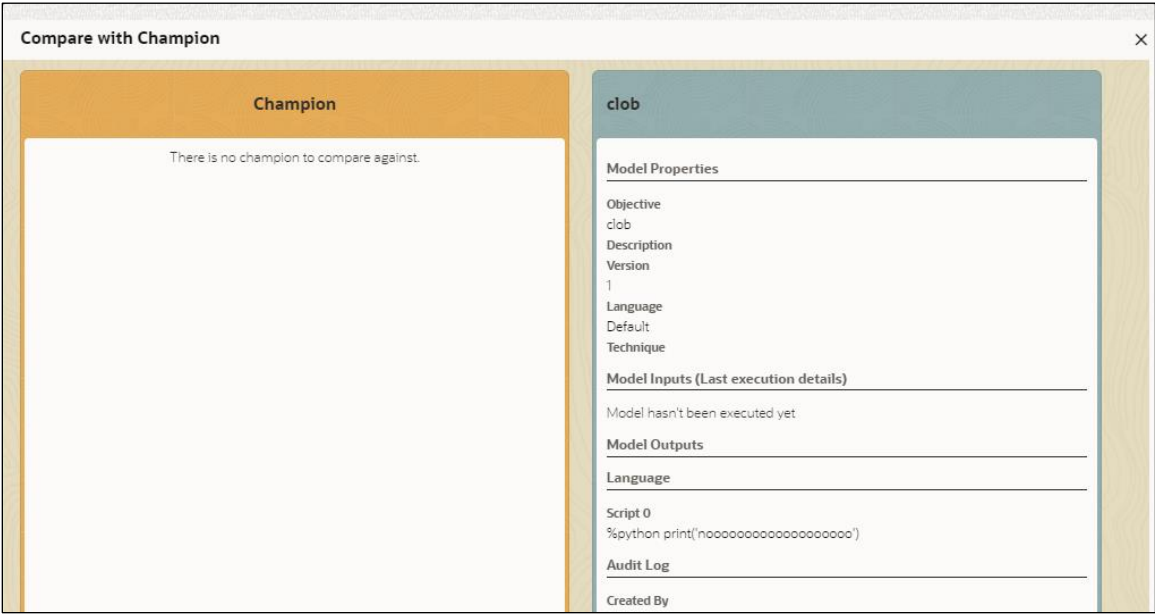
3. Click  next to corresponding Draft Model and select Comparison Model .

Figure 36: Model Details Comparison




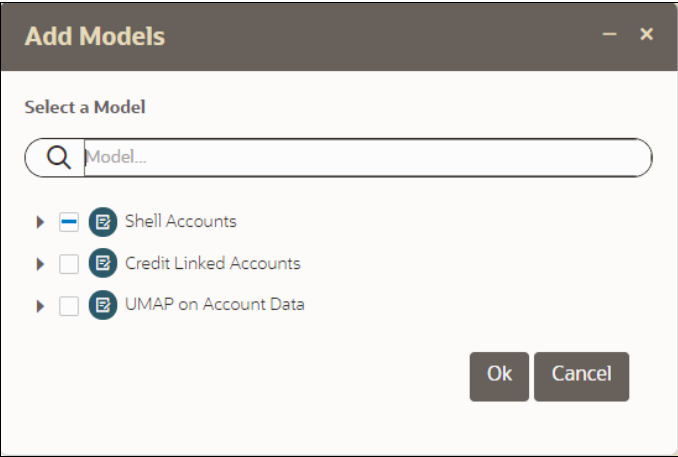


4. Click Add  to add models for comparison. Select two or more models from the Add Model window in the objective to compare.

Figure 37: Select Records to Compare



5. The Model Details Comparison window displays the **Models Details** window with details for the selected models in side-by-side

comparison mode. Use Next  and Previous  to view the models side-by-side.

4.4.6 Understand Model Governance

After [comparing models](#), you must understand the Model Governance system in OFS MMG. The Model Governance has an impact on how the application functions with the various user types and the requests they can place from the Model Details window. You require to understand Model Governance before you request model acceptance, review models, or approve models for production.

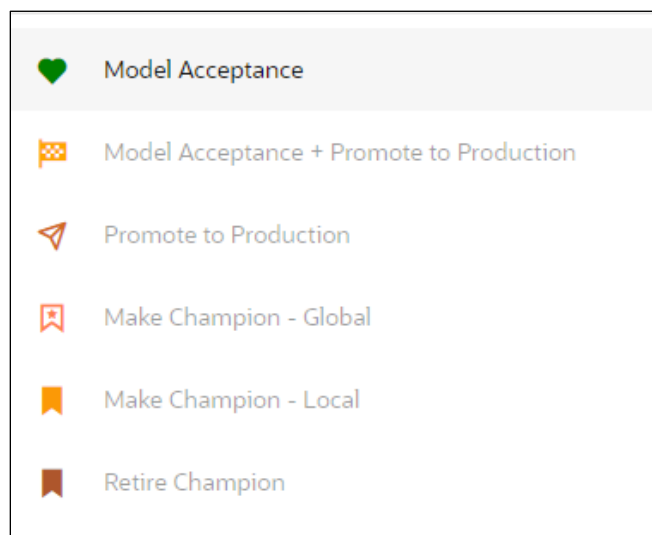
As discussed earlier, the users are of three types:

1. Requester
2. Reviewer
3. Approver

The request consists of the following phases in the Request drop-down list (see the [Request Model Acceptance](#) section for how to access the drop-down list in the Model Deployment window):

4. Model Acceptance
5. Model Acceptance + Promote to Production
6. Promote to Production
7. Make - Champion - Global
8. Make - Champion - Local
9. Retire Champions

Figure 38: The Request Drop-down List



The values in the drop-down list are active based on the type of user (Requester, Reviewer, or Approver) and the phase that the model is in (accepted, promoted to production, global champion, and so on). Let us look at these with a few examples.

Example 1:

Assume that you are a user with Requester privileges and you create a model. Now you can request for the model to be accepted on the Model Details window from the **Request** drop-down list. The values enabled for selection are **Model Acceptance** and **Model Acceptance + Promote to Production**. Let us proceed and assume that you select Model Acceptance, then a user with Reviewer privileges forwards your model to a user with Approver privileges. At this stage, the Approver can choose to reject or accept your model acceptance request. A rejection would bring the model back to the initial state with comments on the updates required before it can be requested for acceptance again. However, if the Approver accepts your model, then the **Make Champion - Local** selection is enabled when you log in. You can create many models and send them for acceptance. After acceptance, any model that is accepted can be made the champion on your local workspace at any time replacing the earlier local champion.



Example 2:

Assume that in the previous example, you selected **Model Acceptance + Promote to Production**, then a Reviewer forwards it to the Approver. The Approver, at this stage, chooses to promote the model to production by selecting **Promote to Production**. The model is now available in the production environment and the Approver can choose at any time to select a model from these models in production and select **Make Champion - Global**. If there exists a Champion model in the production environment, then it will be replaced by the new global champion. However, the earlier champion will still be available in the production environment along with other models and the Approver can choose to make it the global champion again at any time or select any of the other models and make one of them the global champion.

4.4.7 Request Model Acceptance

After comparing models, move the selected models to acceptance. Only a user with either Requester or Reviewer roles can request for model acceptance. The model moved to acceptance is then available to users with the Approver role, who can promote to production. See the [Understand Model Governance](#) section before you start here.

To request a model to promote to production, follow these steps:

1. Click **Advanced Model Management**  to display the **Model Management** window. The window displays folders that contain models and model records in a table.
2. Double click the Model to open it.
3. If a model is a champion, the  icon is displayed on it.



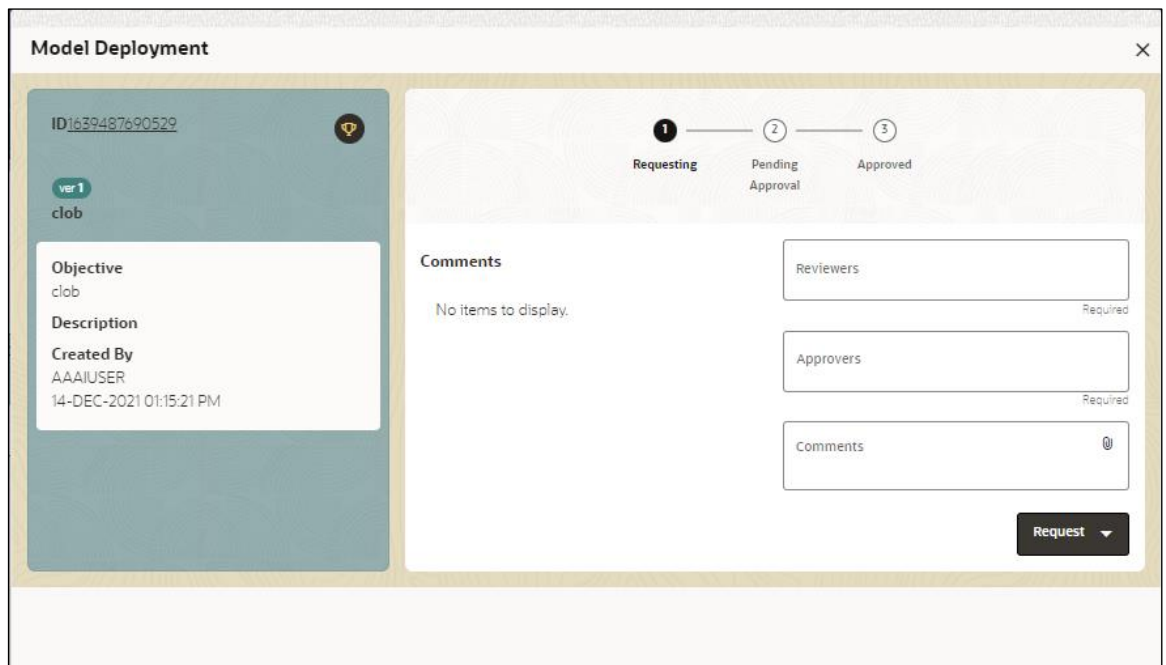
- To make a model a champion from this window, place the mouse in the selected model columns, and click  to display the **Model Details** window. If a model is a champion model, the  icon is displayed.

Figure 39: Model Details Window




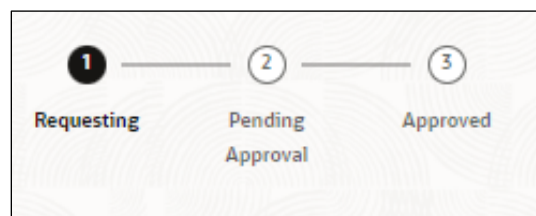
- Select the reviewer group from the **Reviewers** drop-down list.
- Select the Approver group from the **Approvers** drop-down list.
- Enter comments in **Comments** and click  to attach files supporting the comments.
- Use the following features on the window to perform additional actions.
 - View the model status change in the progress indicator. The Progress Indicator displays the various states of progress that the model has been through. Accordingly, you must request, review, or approve models.

Figure 40: Model Approval Progress Indicator



- Click the type of request from the drop-down list:




- Model Acceptance: To review and accept the model creation.
- Model Acceptance + Promote to Production: To review and promote the model to production.
- Make Champion - Local: If the model is not the champion model, select to make it the local champion.
- Promote to Production: To promote a model to production
- Make Champion - Global: If the model is not the champion model, select to make it the Global champion.
- Retire Champion: To retire a Champion model
- Comment History: A record of comments entered in the cycle of model creation and approval with the feature to download attachments.

The model sent for acceptance or for promotion to production is now displayed to a Reviewer when signed in, who must either accept the request or reject it.

4.4.8 Review Models and Move to Approve or Reject

The Reviewer must provide comments describing the action (approve or reject). If comments are related to rejection, then model goes back to the Requester to make changes or to delete it. If comments are related to approval, then model moves further in the workflow and is displayed to an approver. See the [Understand Model Governance](#) section before you start here.

To review a model, follow these steps:




1. Click **Launch Workspace**  next to corresponding Workspace to Launch Workspace to display the **MMG Dashboard** window with application configuration and model creation menu.
2. Click **Advanced Model Management**  to display the **Model Management** window. The window displays folders that contain models and model records in a table.
3. Click  to display the Model Details Window.
4. Review the details and send it back to the Requester for modifications or send it to an Approver.

4.4.9 Approve Models and Promote to Production

The models reviewed and set to promote to production by either the Requester or Reviewer is displayed to the Approver when signed in. The Approver has to either reject

the model and send it back to the requester with supporting comments or approve it for pushing to production. See the [Understand Model Governance](#) section before you start here.

To approve or reject models, follow these steps:





1. Click **Launch Workspace**  next to corresponding Workspace to Launch Workspace to display the **MMG Dashboard** window with application configuration and model creation menu.
2. Click **Advanced Model Management**  to display the **Model Management** window. The window displays folders that contain models and model records in a table.
3. Select a model from the records in the objective.
4. Click  to display the Model Details Window.
5. Click **Approve** or **Reject** with appropriate comments.

4.4.10 Deploy Models in Production and Make it a Global Champion

After approving the models, deploy it to the production environment. You must have an Approver function role and privileges to do this activity.

Note: Sandbox should have the production workspace attached in order to have this option enabled.

To deploy Models in production, follow these steps:

1. Click **Launch Workspace**  next to corresponding Workspace to Launch Workspace to display the **MMG Dashboard** window with application configuration and model creation menu.
2. Click **Advanced Model Management**  to display the **Model Management** window. The window displays folders that contain models and model records in a table.
3. Select the model to deploy and click  to display the details of the model. If a model is a champion, the  icon is displayed.

4.5 Execute Models using Scheduler Service

The models that you have created require that they are executed using Scheduler Service before they can be available to the users of OFSAA applications. For more information on this, see the [Scheduler Service](#).

MMG supports following three Components during the Task creation:

- Model
- Populate Workspace
- Custom

Update following Task Parameters if you have selected Components as Model:

Note: Task Parameters will vary based on the selected Component.

The following window shows the Task Parameters for Model Component.

Figure 41: Task Parameters

| Task Parameters | | | |
|-----------------|-----------------------|--------|-------------------------------|
| Parameter | \$BATCHDATES | Value | Batch Date |
| Parameter | \$BATCHRUNID\$ | Value | BATCHRUNID |
| Parameter | Objective | Value* | Click to select param va... ▼ |
| Parameter | Model | Value* | Click to select param va... ▼ |
| Parameter | Link types | Value | Click to select param value ▼ |
| Parameter | Synchronous Execution | Value | Click to select param value ▼ |
| Parameter | Optional Parameters | Value | |

Note: Fields marked with * are mandatory fields.

- Batch Date: Shows the batch execution date. You can enable or disable this parameter.
- Batch Run ID: Shows the batch execution run ID. You can enable or disable this parameter.
- Objective: Select the Object which you want to use for execution. For more information, see the Create Objective (Folders) section. The Sub Objective is displayed with path. For example, if Test1 is Objective and Test11 is Sub Objective,

and you want to use Test11 Objective for execution, then select this field as Test1/Test11.

- Model: Select the Model of selected Objective. It can be any specific model of Objective or All models of Objective.
 - If the ALL_CHAMPION is selected here, then Objectives with no Champion Model is skipped and the Objectives with Champion Models gets executed.
 - If CHAMPION is selected, and no Champion is present, then Model Execution gets fail.
- Link Type: Select the link type for execution. For example: Training, Scoring, or Training+Scoring. For more information, see the Links in the Pipeline Designer section.
- Synchronous Execution: You can set this parameter to Yes or No.
 - If Synchronous Execution is set to Yes, then execution will wait for the notebook execution status.
 - If Synchronous Execution is set to No, then execution will not wait for the notebook execution status, it will trigger the notebook and update task status as successful in batch monitor.
- Optional Parameters: This is used pass the parameters dynamically.

For example:

```
model_group_name=LOB1,benford_flag=Y,benford_digit=1,from_date=01-Jul-2020,to_date=31-Jul-2021
```

Model_group is parameter defined in model and value can be passed here.

The Create Task window also shows the following Header Parameters, which are not editable:

- User: logged in user name
- Workspace: shows the launched workspace name
- Locale: shows the locale. For example: en_US

If you select Component as Populate Workspace, then to use the data population, enter the following parameters

- Additional Parameters
- Table Filters
- Global Filters

For more information, see the Populating Workspace section.

Create Task
Save Close

| | | | | |
|--|-----------------------|--------|----------------------|---|
| Parameter | \$BATCHDATES | Value: | Batch Date | ✓ |
| Parameter | \$BATCHRUNID\$ | Value: | BATCHRUNID | ✓ |
| Parameter | Global Filter | Value: | <input type="text"/> | ✓ |
| Parameter | Table Filters | Value: | <input type="text"/> | ✓ |
| Parameter | Additional Parameters | Value: | <input type="text"/> | ✓ |
| <div style="display: flex; align-items: center;"> ▼ Header Parameters </div> | | | | |
| Parameter | user | Value: | aaaiuser | ✓ |




4.6 Import a Workspace Model Data into a New Model

The model data from existing models in OFS MMG in .dmp format and the existing model data in MMG in .dsnb can be imported during the creation of a new model.

Note: The import should happen inside an Objective only.

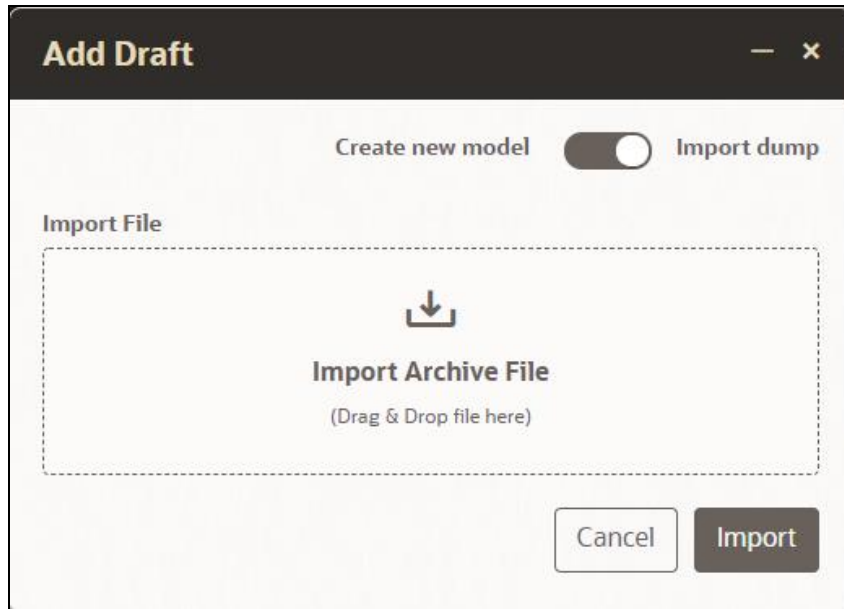
The import of model data lets you reuse and extend on model creation. This topic is part of the procedure of creating Draft Models and after creating a new model using this method, see the [Create Draft Models](#) section for instructions on how to proceed further.

To import model data, follow these steps:

1. Click **Launch Workspace**  next to corresponding Workspace to Launch Workspace to display the **MMG Dashboard** window with application configuration and model creation menu.
2. Click **Advanced Model Management**  to display the **Model Management** window. The window displays folders that contain models and model records in a table.
3. Select an **Objective**.
4. Double click a model to display the model versions in the expanded display.
5. Hover over a model and click  to download the model data dump.

- Click **Add** and  Drafts to display the **Model Details** dialog box for the creation of a new model.

Figure 42: Model Details - Import Dump





- Drag the toggle switch to select **Import Dump**.
- Drag and drop the file into the **Import Dump File** field or click in the box to open the file selector dialog and select a file.
- Click **IMPORT**. A new model is created by importing the model data dump of another model.

4.7 Use Scope Details

The Scope provides a detailed view of the components of the model in the Scope Details window. The window displays a scrollable system.

To access the Scope Details window, follow these steps:

- Click **Launch Workspace**  next to corresponding Workspace to Launch Workspace to display the **MMG Dashboard** window with application configuration and model creation menu.
- Click **Advanced Model Management**  to display the **Model Management** window. The window displays folders that contain models and model records in a table.


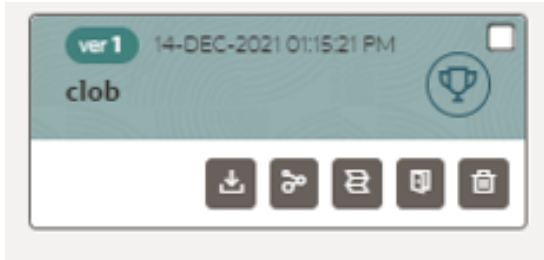
3. Click  and the record expands to display information for the versions and current status of the model.
4. Hover over the model records to view the various icons available for the model.

Figure 43: Mouse over the Model to View Scope Icon




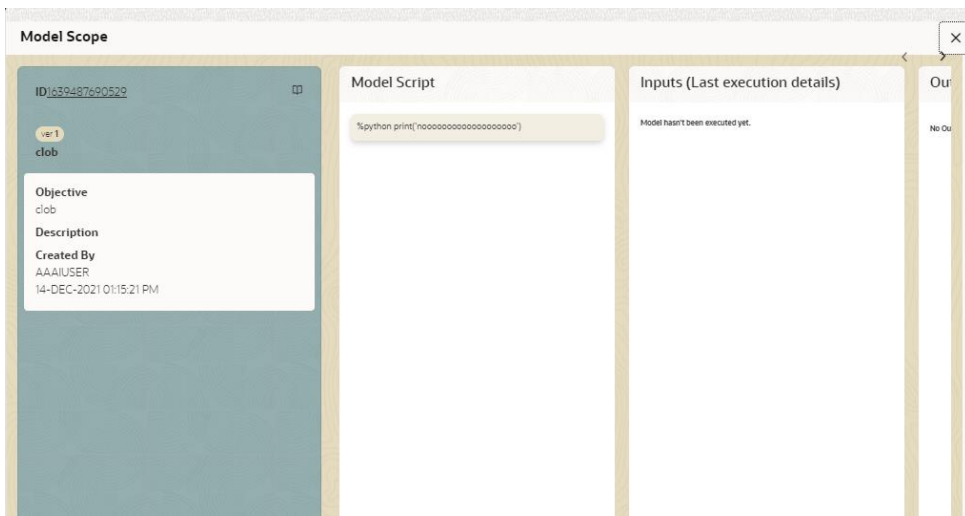
5. Click  to display the Scope Details window.

Figure 44: Mouse Over the Model to View Scope Details window






Use the vertical and horizontal scroll to view the details that make up the model.

4.8 Use View Models

The View Models feature launches the OFS MMG Data Studio window. You can edit models on this window.

To use View Models, follow these steps:

1. Click **Launch Workspace**  next to corresponding Workspace to Launch Workspace to display the **MMG Dashboard** window with application configuration and model creation menu.

2. Click **Advanced Model Management**  to display the **Model Management** window. The window displays folders that contain models and model records in a table.
3. Click  next to corresponding Model and select Open in Pipeline Designer.

See the [Create Paragraphs in Pipeline Designer](#) sections for details on how to use the OFS MMG Data Studio.






4.9 Edit Models

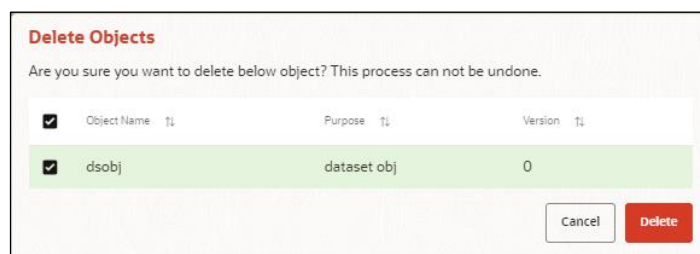
The editing of models created versions that are different from the previously saved model and the cycle of [Model Governance](#) applies to any edited model. You can edit models from the OFS MMG Data Studio window using Python scripting language.

You can edit the script of version 0 only even in Pipeline Designer and Studio. It is not possible in other versions.

4.10 Delete Objectives and Draft Models

To delete Objectives and Models that exist in the Objectives, follow these steps:

1. Click **Launch Workspace**  next to corresponding Workspace to Launch Workspace to display the **MMG Dashboard** window with application configuration and model creation menu.
2. Click **Advanced Model Management**  to display the **Model Management** window. The window displays folders that contain models and model records in a table.
3. Click  next to corresponding Model and select Delete Draft .
4. Select two or more objectives or models from the records.
5. Click  to display the Delete Draft dialog box.
6. Click **Delete** to delete, or click **Cancel** to cancel.



5 Dataset

Dataset allows you to manage the entire operation related to data set. You can perform the following two things using the Dataset window:

- Define a metadata on how you want to create a dataset
- In addition, a mechanism where you can actually take a snapshot of real time data and store it. So, it can be used later in the pipeline.

This is similar to T2Ts, where you can select data from Data Source, such as file, table or other dataset and so on. The data can be imported from one column of one table, and another column from another table, or any file. After extracting the data from tables or files, provide the name to Target Dataset.

The Dataset is a trail based UI that allows you to configure the dataset details.

5.1 Accessing the Dataset Summary Page

The Dataset Summary page gives access to the various Dataset functions such as create, view, and delete.

NOTE Users Groups must be mapped to the SBADMIN role to access the Sandbox Summary page.

To access the Dataset Summary page, follow these steps:



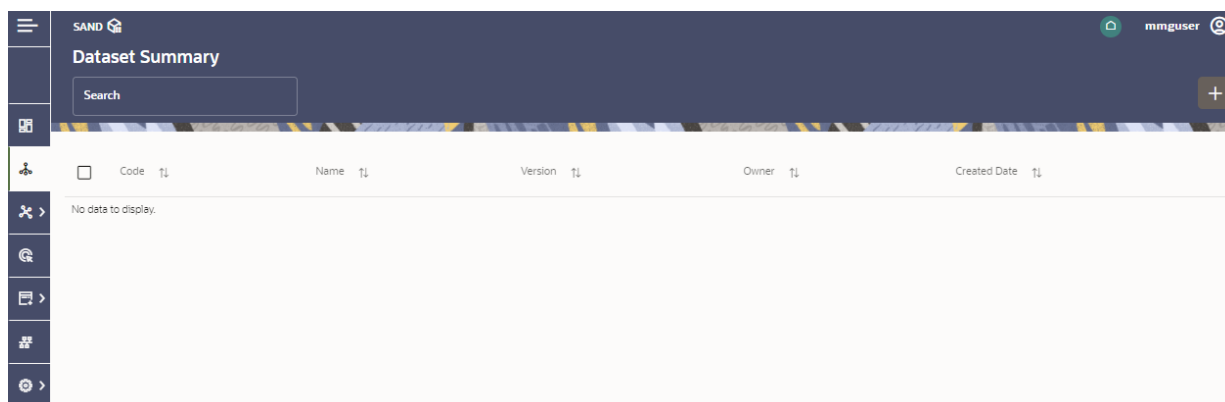

1. Click **Launch Workspace**  next to corresponding Workspace to Launch Workspace to display the **MMG Dashboard** window with application configuration and model creation menu.
2. Click Dataset  to display the **Dataset Management** window. This window displays the dataset records in a table.

Figure 45: Dataset Summary Page



The following table provides descriptions for the fields and icons on the **Dataset Summary** page.

| Field or Icon | Description |
|---------------|---|
| Search | The field to search for Dataset. Enter specific terms in the field for which you want to search and press Enter on the keyboard to display the results. |
| Code | The code of the dataset. |
| Name | The name of the dataset. |
| Description | The description for the Workspace |
| Version | Version of dataset |
| Created Date | The date on which the Dataset was created. |
| Owner | The owner of the dataset. |
| Add | Click Add  to create a new Dataset. See the Create a Dataset section for more information. |

5.2 Create a Dataset

The Dataset creation requires entry of the source of dataset and validation. These datasets are required for schema creation.

5.2.1 Creating a Dataset

To create a Dataset, follow these steps:


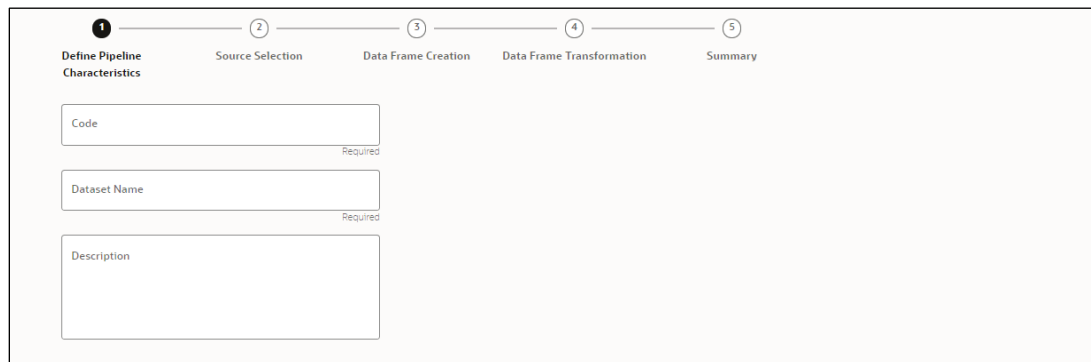
1. Navigate to Dataset Summary page to display the **Dataset Summary** page. This page displays the dataset records in a table.
2. Select  to create a Dataset in the Dataset **Summary** window.

Figure 46: Dataset Creation Window



The screenshot shows a multi-step process for creating a dataset. The first step, 'Define Pipeline Characteristics', is currently active and highlighted with a red circle. The other steps are 'Source Selection', 'Data Frame Creation', 'Data Frame Transformation', and 'Summary'. Below the progress bar, there are three input fields: 'Code' (with a 'Required' label), 'Dataset Name' (with a 'Required' label), and 'Description'.

The following steps show the various phases from Dataset creation:

- Define Pipeline Characteristics
- Source Selection
- Data Frame Creation
- Data Frame Transformation
- Summary


5.2.2 Define Pipeline Characteristics

Enter basic configuration details in this window.

To configure the basic details for the dataset, follow these steps:

1. Enter the required details in the Define Pipeline Characteristics window as shown in the following table.

| Field | Description |
|--------------|---|
| Dataset Code | Enter the code of the dataset. This field is limited to 30 alphanumeric characters. |
| Dataset Name | Enter the name of dataset. This field is limited to 30 alphanumeric characters. Space cannot exceeding 30 characters. You cannot keep this field blank. |
| Description | Enter the purpose of the creation of the dataset. This field is limited to 150 alphanumeric characters. Space cannot exceeding 150 characters. |

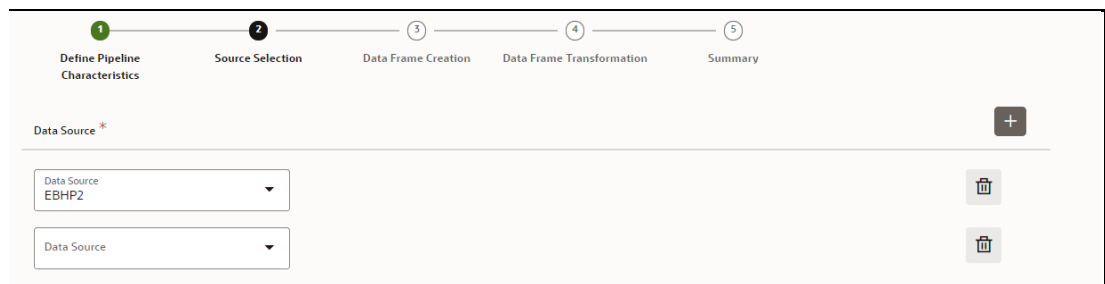
2. Click Next  to go to the next step.

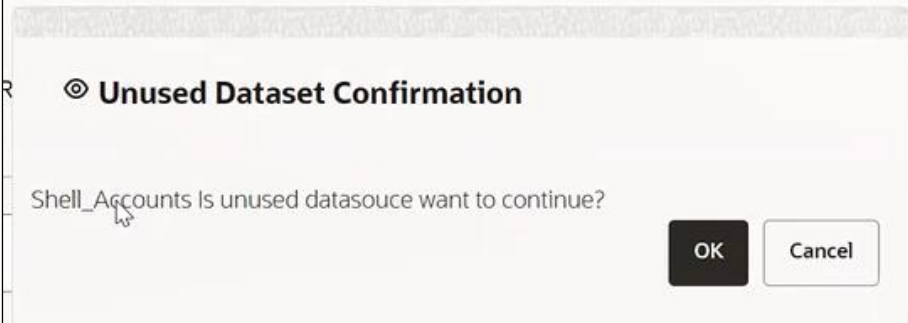

5.2.3 Source Selection


This section allows you to define the source of data.

To configure the Source details for the dataset, follow these steps:

1. Enter the required details in the **Source Selection Details** pane as shown in the following table.



| Field | Description |
|-------------|--|
| Data Source | <p>Here, You can choose the data structures from an existing datasources.</p> <p>The Data Source drop-down list shows all the data sources and the data dorms those are tagged with the corresponding workspace. In addition, this lists all the available unused data source, which can be used. A confirmation message is displayed to tag an unused datasource with workspace.</p>  <p>Here, either use the unused or create a new data set using Add  . When you create a new dataset, it becomes as unused.</p> <p>For more information, see Creating Data Source.</p> |


2. Click Next  to go to the next step.

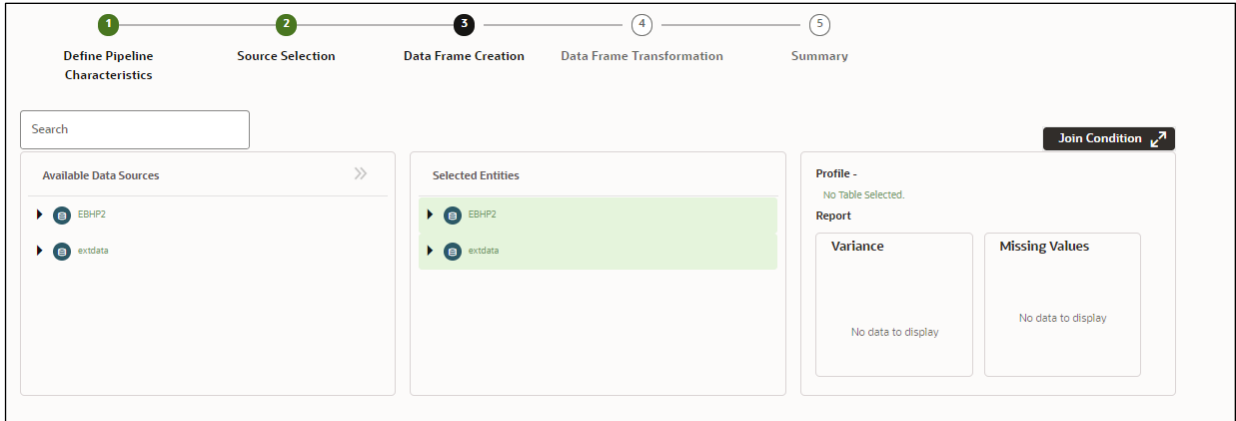
5.2.4 Data Frame Creation

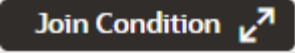
This window allows you to select entity part (for example, column of table) of the data set. The data type selected in the previous step requires the definition of database objects to be used.

To configure the Data Frame Creation, follow these steps:

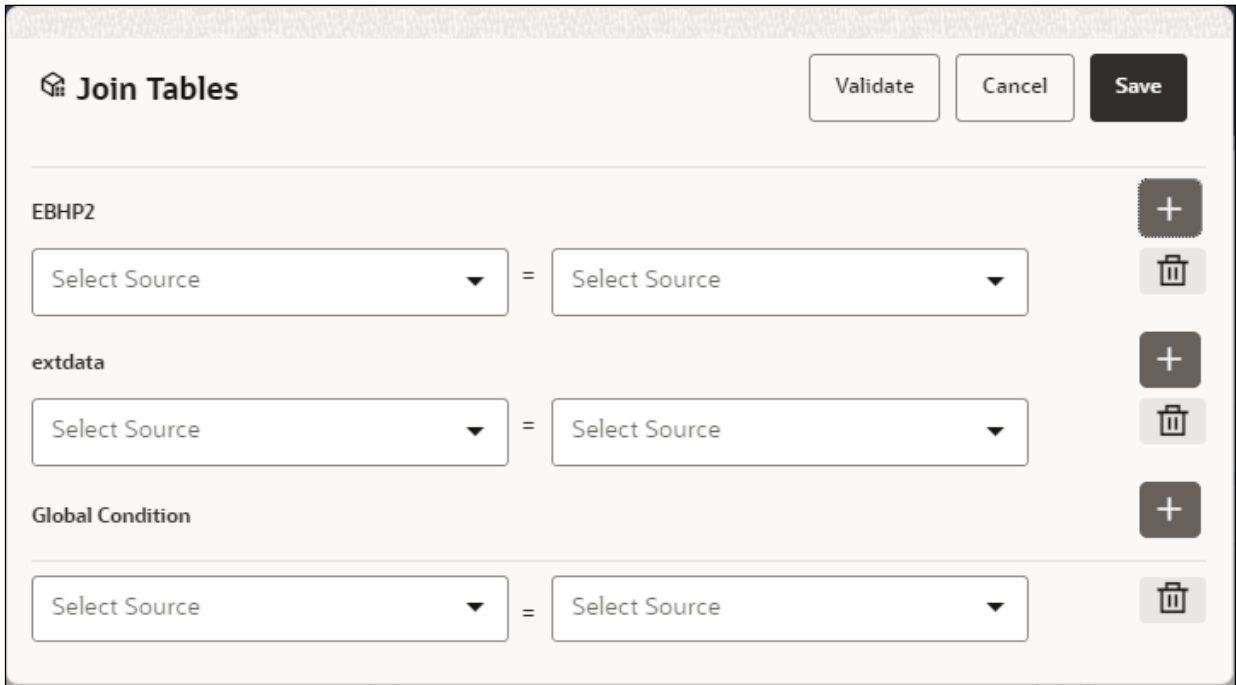
1. Select the required data source from the **Available Data Sources pane** and click >> to move the selected data to **Selected Entities** pane. The **Available Data Sources** section shows the high-level data sources. You can select data from multiple data source entities. The **selected Data Sources** are displayed in **Selected Objects** pane.

2. Click Next  to go to the next step.



- Use Join Condition  to combine the data source details. Each data sources have multiple tables and multiple columns, so you can join them using Join Condition window.

Note: As of now, only INNER JOIN is present.

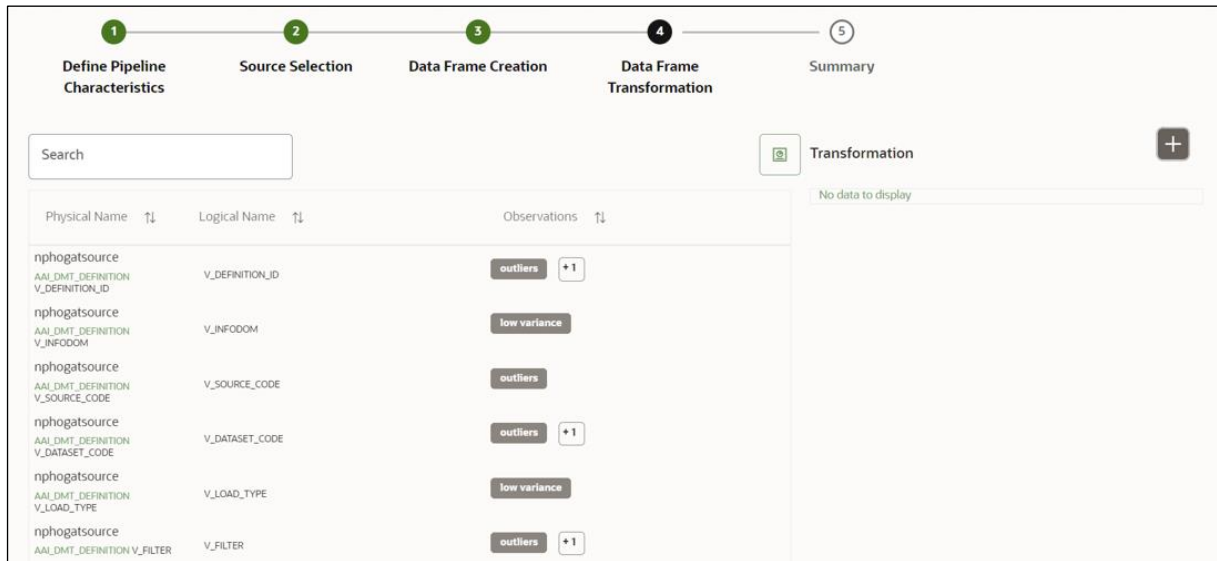


5.2.4.1 Viewing Profile

The Profile section from RHS shows the report based on Selected Objects section. For example, Missing Values report shows the details of missing data in selected table in Selected Objects section and you must fix these missing values before using the selected table. You can perform three types of data transformations to correct PCA, Scaling, and Missing Values.

5.2.5 Data Frame Transformation

This window allows you to transform the data source information. This complete grid displays the Table like structure, which helps you to make the data better using many methods, such as by remove all the missing values, performing scaling and so on. Here, Dataset name is table name and FCC data represents to columnn.



This window shows the following columns:

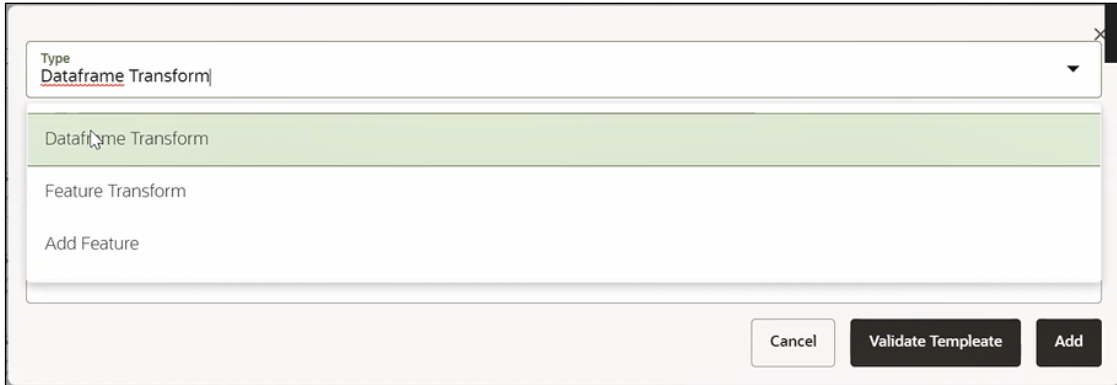
- **Physical Name:** Shows the Physical Name of column.
- **Logical Name.** Shows the Physical Name of column. You can edit the Logical Name.
- **Observations:** The Observations field shows the value of column. For example, if any column is missing any value, you can easily identify missing value columns. Use Transformation button to fix these values. In addition, if all workspace/Infodom has one value, then Observation column can have Constant value and you can ignore this column to include.

The profile button helps you to view profile the final data frame that you have selected. For more information, see the Viewing Profile section.

To define the data transformation, follow these steps:

1. Edit the column details as required.

2. Click Transform . The Transform window is displayed.



3. Select the Transformation Type. Following three types are available:

- Dataframe Transform: This is used to transform entire dataset. For example, if you want to remove all missing values from all the columns of entire dataset.
- Feature Transform: This is used to transform a particular column of dataset.
- Add Feature: This is used to add a new column to dataset. This is useful, if you want to add a new column based on derived T2Ts (from data source).

4. Select the Transform, such as Missing Value, custom transform and so on. In case of Custom Transform, define the details in Script field.

Below are Sample Custom Scripts

- Directly pass input data frame to outputdf_out=df_prev
- Drop first row of data framedf_out=df_prev.drop(0,axis=0) if not df_prev.empty else df_prev
- Drop column from data framedf_out = df_prev.drop('colname',axis=1)

5. Click Validate Template to validate the details.

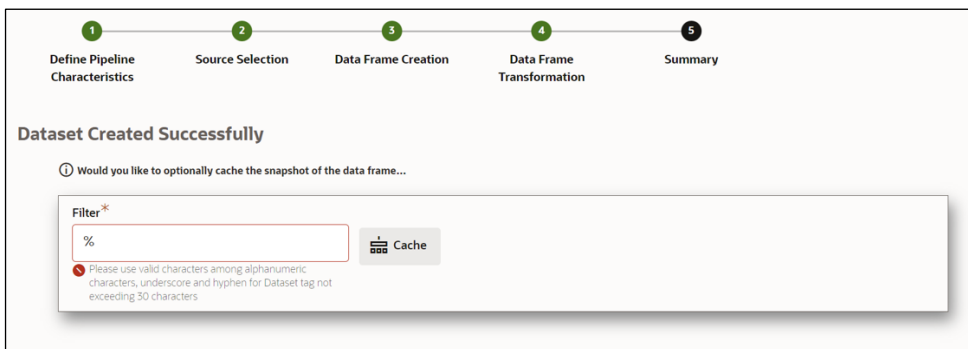
6. Click Add to add the new transformation.

7. Click Finish to navigate to Summary window. This saves the metadata of dataset.

5.2.6 Display Summary

The **Summary** pane displays the status of the dataset creation.

Figure 47: Dataset Creation Summary



Enter the cache (tag) name having alphanumeric char, underscore and hyphen not exceeding 30 characters and click on Cache.

5.3 Caching the Data

To use the dataset in model pipeline or data pipeline, the actual data is fetched using the Cache option. For example, to take the data from data frame on As of Date, create the data frame and provide the name to cache. Only Cache pulls the data from data frame.

This helps the things to work faster when you have millions of data and you want to use intermediate data for use. For example, if you have 1 million data and want to use only 10,000 out of that, then perform the sampling for that 10, 000 entries. This increases the speed of processing, validation of information.

5.3.1 Creating Dataset Metadata

Metadata for creating a dataset can be defined from UI. A new link has been created for this in the LHS panel.

5.3.2 Caching Dataset

- Once the metadata is created, the original data can be cached. A snapshot of the actual data in the dataset at the current time can be stored referenced by a tag name.
- The location for caching is in the datastudio server location
`$DS_HOME/work/ftpshare/mmg/workspace_name/dscode/tag`. The dataset will be saved as a parquet file with name `dscode_tag.parquet`
- When executing all APIs from notebook, workspace has to be attached.
- Caching can be performed in 2 ways
 - From UI, immediately after saving the metadata

Or the users will have to fetch(create) a new snapshot/dataframe of the dataset using the API 'Fetch New Snapshot of dataset' and manually cache using the 'Caching Data Frame' API.

5.4 Useful Dataset APIs from notebook

5.4.1 Listing tags of Datasets Cached from UI

To get a list of all snapshots/tags of a dataset cached from UI, use the API below:

| API | Notebook Script | Notes/Input |
|------------------------|---|---|
| List Tags of a Dataset | <pre>from mmg.datasets import list_tags list_tags(dscode)</pre> | <p>dscode = dataset code - <i>string</i></p> <p>tag = tag with which the dataset was cached - <i>string</i></p> |

5.4.2 Deleting Cached Dataset

A cached dataset can be deleted by using the API below where tag refers to a particular snapshot/timestamp of the dataframe

| API | Notebook Script | Notes/Input |
|----------------|--|--|
| Delete Dataset | <pre>from mmg.datasets import delete_df delete_df(dscore, tag)</pre> | dscore = dataset code - <i>string</i> tag = tag with which the dataset was cached - <i>string</i> |

5.4.3 Listing all Datasets with Metadata saved from UI

| API | Notebook Script | Notes/Input |
|---------------|---|-------------|
| List Datasets | <pre>from mmg.datasets import list_datasets list_datasets()</pre> | |

5.4.4 Fetching Dataset in Notebook

Dataset whose metadata has been saved from UI can be fetched in 2 ways:

8. Dataset that has already been cached from UI can be fetched using first API below by providing the dataset code and tag.(DataFrame will not be recalculated. It will be read from cache.)
9. A new data frame for a dataset can be calculated/fetched using data from the present time with the metadata saved for that dataset as given in second API.

| API | Notebook Script | Notes/Input |
|-------------------------------------|--|--|
| Fetch Dataset Cached from UI | <pre>from mmg.datasets import fetch_ds df = fetch_ds(dscore,tag)</pre> | dscore = dataset code - <i>string</i> tag - <i>string</i> |
| Fetch New Snapshot of dataset | <pre>from mmg.datasets import fetch_ds df = fetch_ds(dscore)</pre> | dscore = dataset code - <i>string</i> |

5.4.5 Cache User's Dataframe from Notebook

A user-made data frame can also be cached using the below API. It will be stored in the the datastudio server in location : `$DS_HOME/work/ftpshare/mmg/workspace_name/cached/tag`. The dataset will be saved as a parquet file with name `cached_tag.parquet`.

Note: This dataframe is not related to dataset created from UI. This is independent of dataset metadata.

| API | Notebook Script | Notes/Input |
|--------------------|--|--|
| Caching Data Frame | <code>from mmg.datasets import cache_df</code> <code>path=cache_df(df, tag)</code> <code>path</code> | <code>df = dataframe to be cached - pandas dataframe</code> <code>tag - string</code> |

5.4.6 Fetching Data Frame Cached from Notebook

The data frame cached from notebook can be fetched using the API below

| API | Notebook Script | Notes/Input |
|-------------------------------|--|---------------------------|
| Fetch dataset cached manually | <code>from mmg.datasets import fetch_ds</code> <code>df = fetch_ds("cached",tag)</code> | <code>tag - string</code> |

5.4.7 List Tags of all Data frames Cached from Notebook

| API | Notebook Script | Notes/Input |
|---------------------------------------|---|-------------|
| List Tags of Manually Cached Datasets | <code>from mmg.datasets import list_tags</code> <code>list_tags()</code> | |

5.4.8 Sample Custom Scripts

Below are few sample scripts which the users can refer to create transformations.

| No | Function | Script | Comments |
|----|--|-----------------------------|----------|
| 1. | Directly pass input data frame to output | <code>df_out=df_prev</code> | |

| | | | |
|----|------------------------------|--|------------------------|
| 2. | Drop first row of data frame | <code>df_out=df_prev.drop(0,axis=0) if not df_prev.empty else df_prev</code> | |
| 3. | Drop column from data frame | <code>df_out= df_prev.drop('colname',axis=1)</code> | FEATURE TRANSFORMATION |

6 Model Audit

At any time, you can audit the models from the Model Audit window. The Model Audit window provides the complete details of model. This shows the information such as, when Model was created, who created the Model, workflow of Model, for example when this Model became champion or deployed, and so on.

The sequence of actions performed in the model lifecycle is listed in the table view and the timeline view (graphical representation).

To audit models, follow these steps:



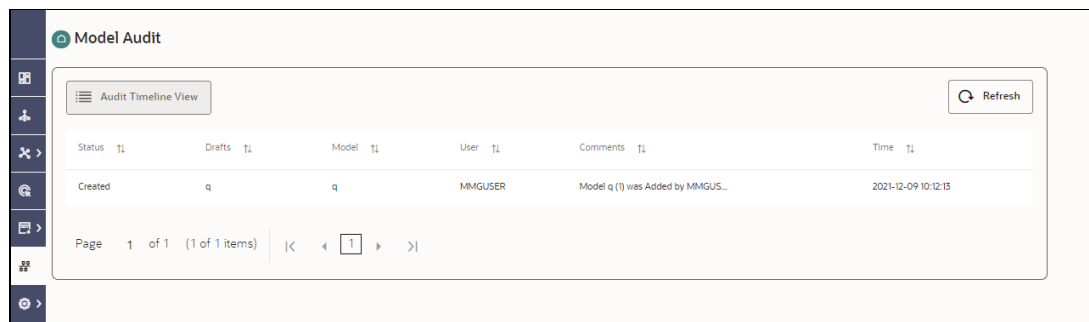
1. Click **Launch Workspace**  next to corresponding Workspace to Launch Workspace to display the **MMG Dashboard** window with application configuration and model creation menu.
2. Click **Model Audit**  to view the time of the various actions performed on the model in the **Model Audit** window.

Figure 48: Model Audit Window



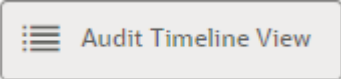
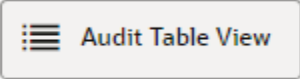

3. Click  for Timeline View. Click  to switch to the regular view. Click  to refresh the Model Audit window.



Figure 49: Model Audit Window Timeline View with Horizontal Time Axis

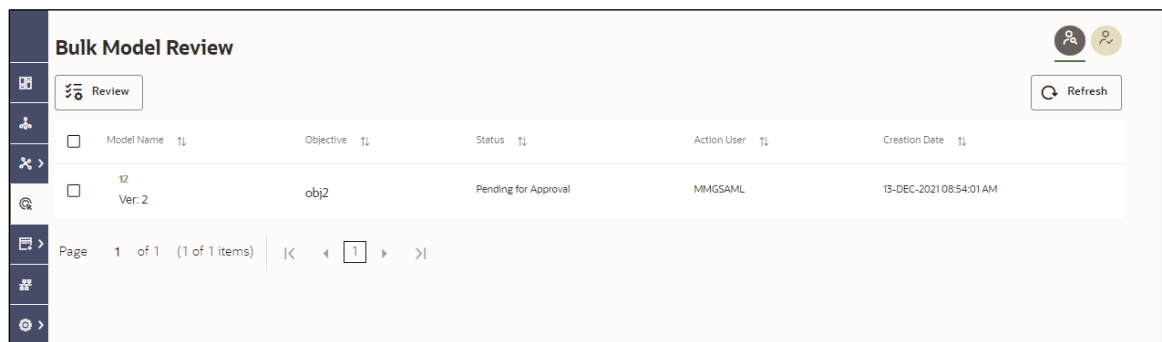


7 Model Actions

The Model Actions window allows you to view the list of models associated with the workspace.

For example, when any Model User sends and Model for review or approval, the user receives the bulk Models in Model Actions window for review or approval. This helps when lot of model are received for review before deployment or some actions need to be performed on many models, such as making models champion locally or globally, and so on.

1. Click **Launch Workspace**  next to corresponding Workspace to Launch Workspace to display the **MMG Dashboard** window with application configuration and model creation menu.
2. Click **Model Actions**  to view the list Models pending for action. For a Reviewer, sample Model Review window is showing below:



3. To review the model, follow these steps:


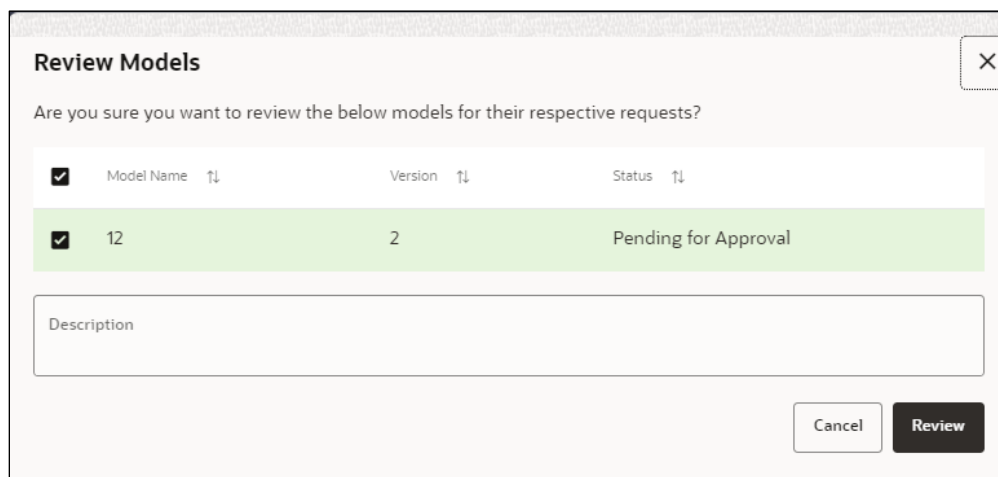
- a. Select the Model using the corresponding check box and click Review .
- b. Enter the comments in Comments field of the Review Models window and click **Review**.

Figure 50: Review Models window



4. For an Approver, sample Model Approve window is showing below:

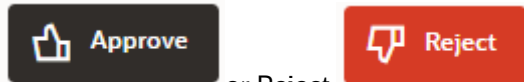
Bulk Model Approval

Approve Reject Refresh

| <input type="checkbox"/> | Model Name ↑↓ | Objective ↑↓ | Status ↑↓ | Action User ↑↓ | Creation Date ↑↓ |
|--------------------------|---------------|--------------|----------------------|----------------|-------------------------|
| <input type="checkbox"/> | 12 Ver: 2 | obj2 | Pending for Approval | MMGSAML | 13-DEC-2021 08:54:01 AM |

Page 1 of 1 (1 of 1 items) | < < 1 > > |

a. To approve or reject the model, follow these steps: Select the Model using the



corresponding check box and click Approve or Reject.

b. Enter the comments in Comments field of the Approve Models window or Reject Models window and click Approve or Reject.

Approve Models ×

Are you sure you want to approve the below models for their respective requests?

| <input checked="" type="checkbox"/> | Model Name ↑↓ | Version ↑↓ | Status ↑↓ |
|-------------------------------------|---------------|------------|----------------------|
| <input checked="" type="checkbox"/> | 12 | 2 | Pending for Approval |

Description

Cancel Approve

Figure 51: Approve Models window

Approve Models ✕

Are you sure you want to approve the below models for their respective requests?

| <input checked="" type="checkbox"/> | Model Name | Version | Status |
|-------------------------------------|------------|---------|----------------------|
| <input checked="" type="checkbox"/> | new | 1 | Pending for Approval |

Comments *

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- Do you need more information? If so, where?
- Are the examples correct? Do you need more examples?
- What features did you like most about this manual?

If you find any errors or have any other suggestions for improvement, indicate the title and part number of the documentation along with the chapter/section/page number (if available) and contact the [My Oracle Support](#).

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