Oracle® Financial Services Data Foundation Cloud Service for Banking

Data Operations Guide

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1 Managing Processes

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1

Managing Processes

Process Orchestration is a design and execution service that empowers process pipeline developers to implement pipelines based on models created by business analysts. This framework enables developers to orchestrate **Run Pipelines** within DFCS and design the artifacts required for these pipelines.

The Process Modeller and the Process Monitor are two key parts of Process Orchestration. The Process Modeller is used to model pipelines. It aids in representing the various artifacts required for modeling and provides implementation details of the DFCS process artifacts. The Process Monitor is used to monitor instantiated pipelines of DFCS.

DFCS supports orchestration of the Run Pipeline, which is any orchestrated pipeline consisting of DFCS tasks and service calls that run within the DFCS context.

1.1 Key Features of Data Operation

- Support for visual modeling of pipelines
- Provision of seeded pipelines with ability to modify them
- Ability to create new Run pipelines
- Support for registration of process, activity, and implementing transition logic separated from the modeling itself
- Built-in Orchestration Engine for task execution
- Provision of multiple components and canvas to visually stitch the DFCS components to form the Run pipeline
- Ability to monitor process during all stages of the execution process

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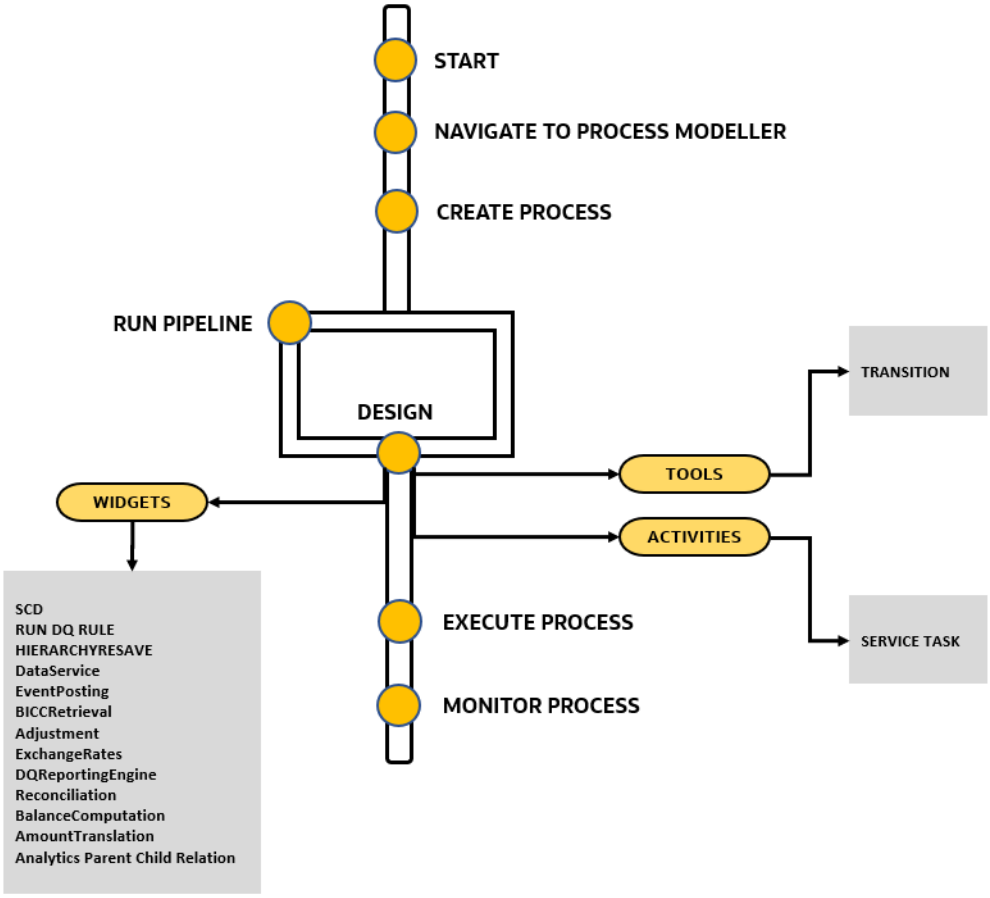
1.2 Process Pipeline Flow

Figure 1-1 Process Pipeline Flow



1.3 Access Process Orchestration

To access Process Orchestration, complete the following steps:

1. From the Home page, click **Process Orchestration** from the LHS menu.

   The **Process Modeller Summary** window is displayed.

2. Select any existing process flow to open it in the **Process Flow Canvas**, or click the **Add** icon to create a new process flow.

   For more details, see the Designing and Executing Pipelines for New User Interface Section.

   The **Process Monitor Summary** window is displayed.

3. To monitor any executed or currently running process, click the **Process Monitor** icon from the page header to view the **Process Monitor** summary page.

   See the Process Monitor for the New User Interface Section for more information.

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1.4 Access Process Orchestration for New User Interface

To access Process Orchestration, complete the following steps:

1. From the Home page, click **Process Orchestration** from the LHS menu.

   The **Process Modeller Summary** window is displayed.

2. Click **Switch to New UI** link to experience the new PMF user interface.

3. Select any existing process flow to open it in the **Process Flow Canvas**, or click the **Create** to create a new process flow.

   For more details, see the Designing and Executing Pipelines for New User Interface Section.

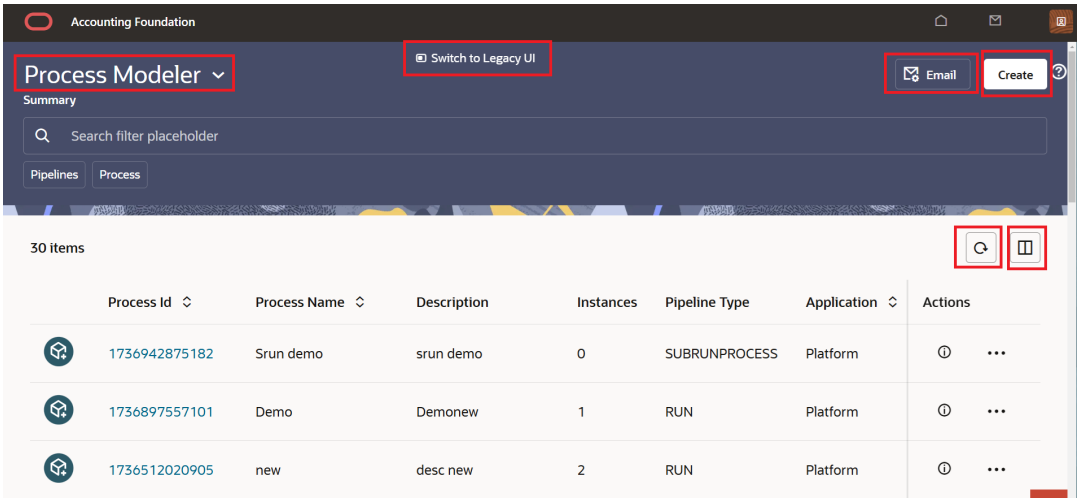
   The **Process Monitor Summary** window is displayed.

4. To monitor any executed or currently running process, click the **Process Monitor** option from the page header dropdown to view the **Process Monitor** summary page.

   See the Process Monitor for the New User Interface section for more information.

   The new PMF user interface is displayed as follows:

Figure 1-2 PMF New UI



The new PMF user interface has the following enhancements:

- Header consists of the drop down for the Process Modeler, Process Monitor and Dashboard options.
- **Create** button to create a new PMF process.
- **Email** button to navigate to PMF Email notification.
- **Refresh** button to refresh the Summary page.
- **Columns** button to display the column details that you wish to view in the summary page.
- **Scheduler** button to schedule a PMF process.

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> **Note**
>
> You can switch back to the legacy user interface at any point in time using the **Switch to Legacy UI** link available at the top of the page.

1.5 Designing and Executing Pipelines for New User Interface

You can design and execute pipelines using the new Process Modeler user interface.

1.5.1 Process Modeler for the New User Interface

The Process Modeler page displays existing pipelines along with their details such as: process ID, process name, process description, pipeline type, instance, and application.

On this page, you have options to:

1. Click **Create** to create a new pipeline.
2. Click the process ID to launch and edit the pipeline.
3. Click the **Menu** button and do the following for each pipeline:

- View a process flow
- Launch the process in a new window.
- Copy a process flow
- Delete a pipeline.
- Monitor the pipeline in the **Process Flow Monitor** window
- Execute a pipeline

Use the **Search** grid to search for a pipeline by providing a keyword containing the process ID, process name, or description. Click the **Reset** icon to reset the search fields.

You can narrow down your search results by additionally selecting the **Pipelines** options to filter pipelines based on pipeline type. Example: To view only **Run Pipelines**, click inside the **Pipeline** list, and select **Run Pipeline**.To view only **Sub Run Process**, click inside the **Pipeline** list, and select **Sub Run Process**. Remove the other pipeline types if already selected and click **Search**.

You can also sort the pipelines on this page based on the **Process ID**, **Process Name**, or **Application**. Click the **Columns** icon and select the columns that you wish to display.

1.5.2 Canvas and Components for New User Interface

The canvas is used to design the process flow. There are Expand/Compact icon, Application Rules, Data Fields, Execution icon at the top of the canvas. After the creation of a process, from the Start node, you can click + icon to add these components such as Activities, Transition and Widgets into the canvas, connect them, and configure each component to design your process flow.

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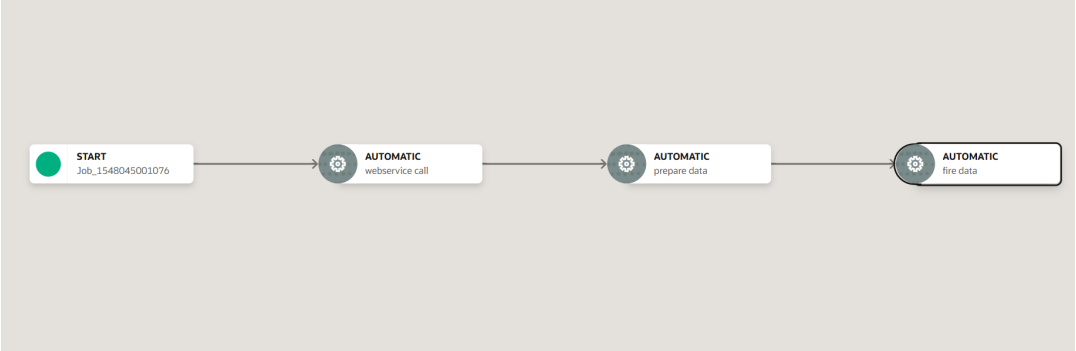
> **Note**
>
> Double-click on the Activities on the canvas or click the **More** icon, select **Properties** of a specific activity to view and edit the Activity details.

1.5.2.1 How to Use a Service Task in the New User Interface

1. Click + icon on the source component, under **Activity** select the **Service Task** icon and it is added on to the canvas.
2. Double-click the **Service Task** component on the canvas to display the configuration window with the **Activity** tab selected.

Figure 1-3 Example of a Service Task in New UI



1.5.2.1.1 Activity Tab in the New User Interface

1. **Activity ID** is auto-populated.
2. By default, the activity ID is populated in the name field. You can enter your own **Activity Name** and **Activity Description**.
3. Select **Status** and **Outcomes** options as required.
4. Click **Save** to save the activity details.

1.5.2.1.2 Implementation Tab in the New User Interface

1. Click the **Implementation** icon on the left in the configuration window.
2. Select the **Execution Rule** from the drop down that has to be executed for this activity. All **Application Rules** of type **Execution Rule** available in your process are listed in drop down.
3. Add **Parameters** you want to pass to the Execution Rule.
   - Click + next to **Parameters**. The **Participant Details** window is displayed.
   - Select the **Data Fields** to which you want to pass the value. This list displays all data fields for the current process or package.
   - Select the **Parameter Type**. Choose **Static** if you want to pass a static value to the selected data field. Enter the **Value**. Choose **Dynamic** to pass the value during the execution of the workflow.
   - The parameters you added are displayed under the **Parameters** in the **Implementation** tab.

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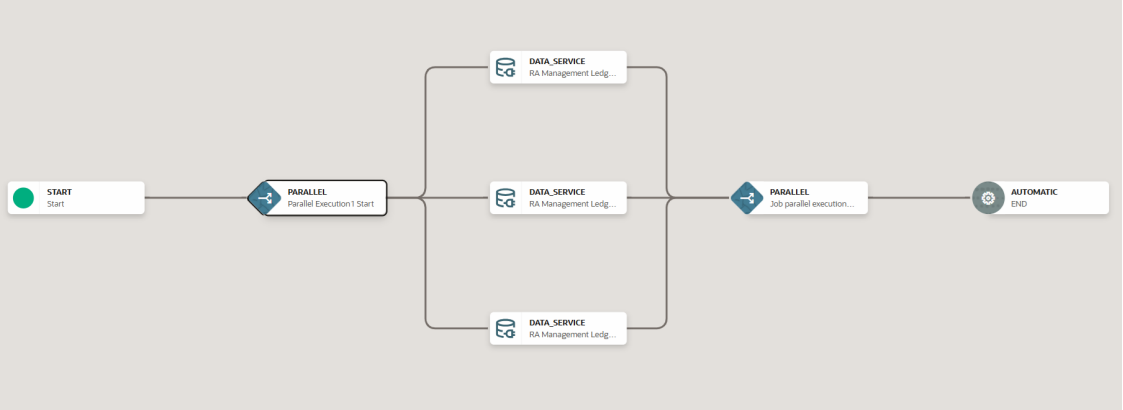
4. Select the **Pre Rule**, which is the Application Rule you want to execute before executing the Execution Rule. Select the Application Rule that you want to set as the pre rule from the drop down.
5. Select the **Post Rule**, which is the Application Rule you want to execute after executing the Execution Rule. Select the Application Rule that you want to set as the post rule from the drop down.
6. Click **Save** to close the configuration window.

1.5.2.2 Executing Parallel Tasks

A Parallel Gateway is used to execute multiple tasks in parallel. In the usual flow, tasks are executed sequentially.

Figure 1-4 Execution of Parallel Tasks Flow in New UI



In the example shown, when the Parallel Gateway is invoked, all the OFSAA components that are placed between Parallel Gateways, are executed simultaneously. After all components are executed, the execution moves to the next activity in the Process Flow.

> **Note**
>
> In case if any one of the task fails as part of parallel gateway, the other ongoing parallel tasks executions are completed. The status of the activities get updated appropriately even though one or more activities fail.

Table 1-1 PMF Run Pipeline Design

Do's for a Gateway (Parallel and Multichoice)	Dont's for a Gateway (Parallel and Multichoice)
Ensure to begin and end with the same gateway during run pipeline design.	A parallel gateway cannot exist within another parallel gateway.
Ensure to add a service task if a parallel gateway is the last executing activity.	Multiple transitions are not supported for any activity in a run pipeline. Therefore, you must only use a parallel gateway.

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Table 1-1 (Cont.) PMF Run Pipeline Design

Do's for a Gateway (Parallel and Multichoice)	Dont's for a Gateway (Parallel and Multichoice)
Tasks which start from a parallel gateway must end in the successive closing parallel gateway.	
Execution of a pipeline will begin from the **Start** activity. Therefore, the transition cannot be stopped for this activity.	

For more information on the Transition and Gateways, see and Transition and Gateways.

1.5.2.2.1 How to Use Parallel Gateways in the New User Interface

This section explains how to design parallel tasks using Parallel Gateways. For example, executing the Reconciliation widget in parallel for different rules.

1. Create a process in the Process Modeler canvas.
2. On the **Process Flow** page, you will see a **START** activity is already present on the canvas. This activity indicates the beginning of the process.
3. Click + icon on the Start node, under **Transition**, click a **Parallel Gateway** widget on to the canvas.
4. Connect the **START** activity with this **Parallel Gateway** widget.
5. Click + icon on the source component to add the widgets representing the tasks that run in parallel on to the canvas. Example: add multiple Reconciliation widgets on to the canvas.
6. Connect the Parallel Gateway widget with each of these widgets representing tasks that must run in parallel. This represents the beginning of the transition.
7. Click + icon on the component to add another Parallel Gateway widget on to the canvas.
8. Connect each of the widgets to this newly added Parallel Gateway widget. This represents the end of the transition.
9. Configure the Reconciliation widgets based on your requirement.
10. Proceed in this manner to create your pipeline with one or multiple parallel tasks.
11. Click **Save**.

1.5.2.3 How to Use a Widget in the New User Interface

1. On the PMF canvas, from the Start Node, click + icon and select the Widgets option and under **Widget** window select the required widget to add on to the canvas.
2. Double-click the widget to open the configuration window for the widget. The **Activity** tab is selected.
3. Enter the **Activity Name** and **Activity Description**.
4. Specify the **Dynamic Parameters** for the widget and click **Save**.

1.5.3 Run Pipeline for the New User Interface

A Run Process is used to create a Run Definition in the Rule Run Framework (RRF). A Run Pipeline is the visual representation of the Run enabled through Process Orchestration.

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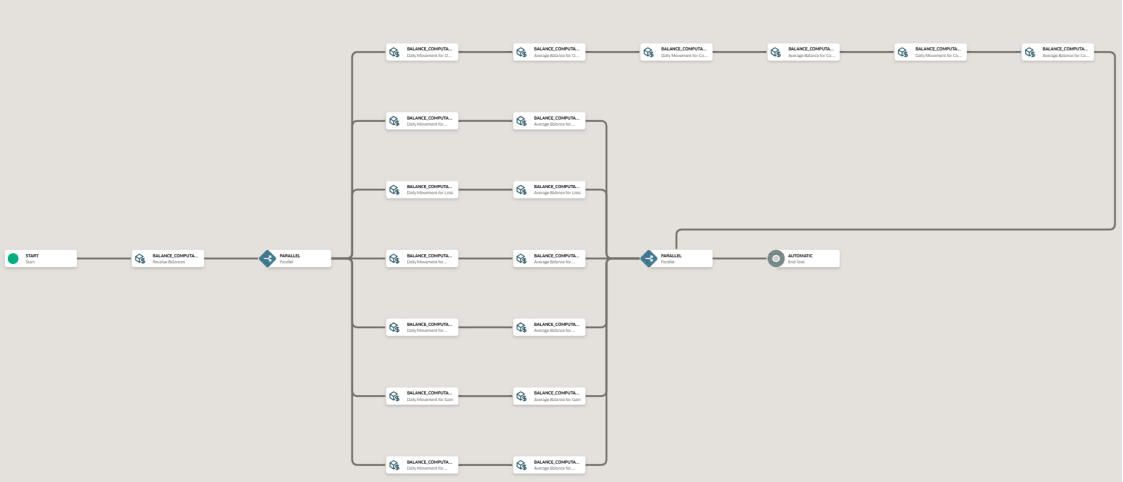
An Example of Run Pipeline

Figure 1-5 Run Pipeline in a New UI



1.5.3.1 Creating a Run Pipeline in the New User Interface

1. Click the **Create** button in the **Process Modeler Summary** page.
2. Enter a **Process Name** , **Process Code** and **Process Description**. The **Process ID** is a unique system-generated value.

> **Note**
>
> When you enter the Process Name and try to enter the Process Code value, the Process Name (removing spaces and special characters) is auto-populated in the Process Code field, by default. You can update the auto-populated value in the Process Code field.

3. Select the appropriate package from the **App Package ID** drop-down.
4. Select **Run Pipeline** from the **Process Type** drop-down list.
5. Select the service that you want to connect to from the **Service ID Workspace** drop-down list.

   The list displays all the services that are mapped to the DFCS Service.
6. Click the **Create** button to save the entered details.

   The Process Flow canvas is displayed.
7. By default, the START activity appears on the canvas indicating the beginning of the process.
8. Click + icon from the Start node to add components from the available list. You can add service tasks, sub pipeline, gateways, and widgets on the canvas.
9. To connect one component with another existing component, then click + icon, select the source component and choose **Start Link**. Next, click on the destination component and click **End Link**.

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10. Proceed to link all the components per your requirement.
11. Click **Save**.

    For more information on modifying, copying, viewing and deleting pipelines, see Additional Functionalities.

1.5.3.1.1 Creating a Sub Run Process Pipeline

Sub Pipeline provides the reusability of Pipelines. Using the Sub Pipeline component, you can call another Pipeline from your parent Pipeline.

1. Click the **Create** button in the **Process Modeler Summary** page.
2. Enter a **Process Name** , **Process Code** and **Process Description**. The **Process ID** is a unique system-generated value.

   > **Note**
   >
   > When you enter the Process Name and try to enter the Process Code value, the Process Name (removing spaces and special characters) is auto-populated in the Process Code field, by default. You can update the auto-populated value in the Process Code field.

3. Select the appropriate package from the **App Package ID** drop-down.
4. Select **Sub Run Pipeline** from the **Process Type** drop-down list.
5. Select the service that you want to connect to from the **Service ID Workspace** drop-down list.

   The list displays all the services that are mapped to the DFCS Service.
6. Click the **Create** button to save the entered details.

   The Process Flow canvas is displayed.
7. By default, the START activity appears on the canvas indicating the beginning of the process.
8. Click + icon from the Start node to add components from the available list. You can add service tasks, sub pipeline, gateways, connectors, and widgets on the canvas.
9. To connect one component with another existing component, then click + icon, select the source component and choose **Start Link**. Next, click on the destination component and click **End Link**.
10. Proceed to link all the components per your requirement.
11. Click **Save**.

1.5.3.1.1.1 Adding a Sub Process to a Sub Run Pipeline

Reusability is important while designing your pipeline. Sub Run Pipeline is the mechanism in the PMF to call another pipeline from your parent pipeline.

1. From the PMF canvas, click + icon and select the Sub Pipeline from the Activity.
2. Double-click the Sub Pipeline icon on the canvas. The Sub Process Details window is displayed.

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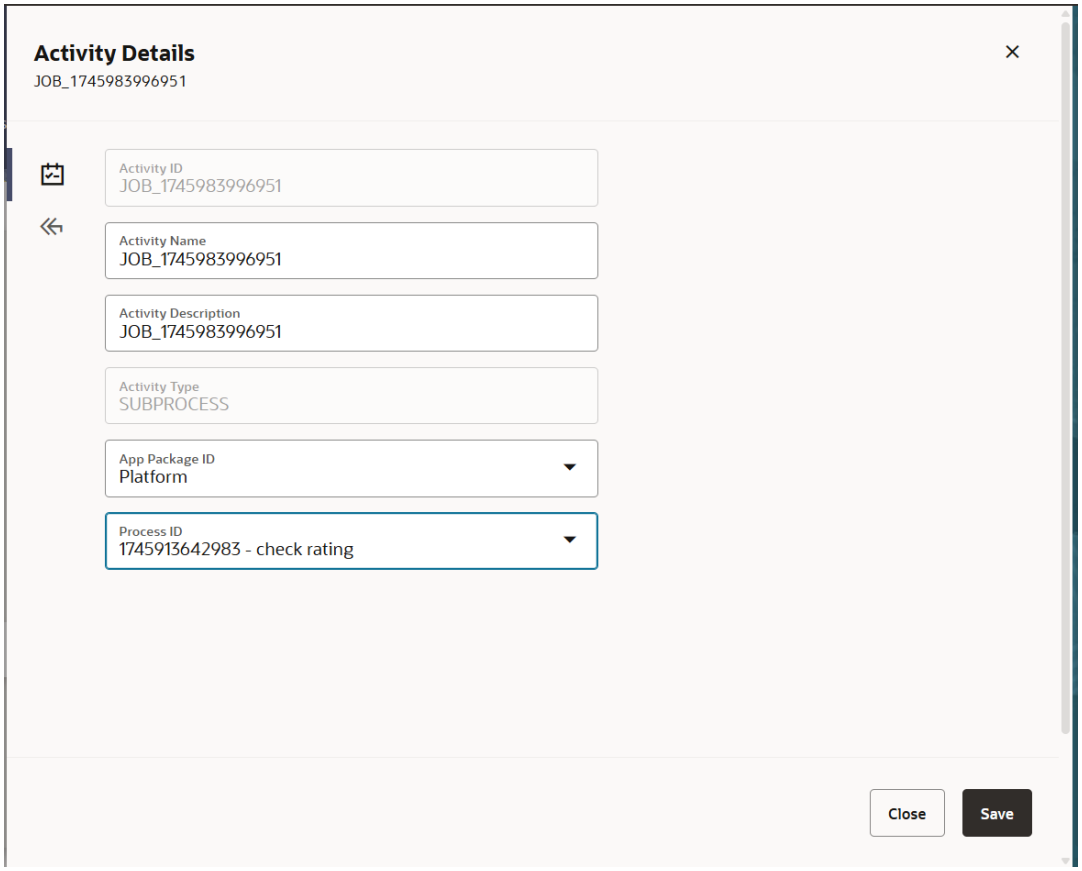
Figure 1-6 Sub Pipeline Activity Details



3. Enter the details as given in the table:

Table 1-2 Sub Pipeline Information

Report Name	Period to Date
App Package ID	Select the Application Package from which you want to call a process, from the drop-down list. The package IDs that are seeded from the backend are displayed in the list.
Process ID	Select the Process that you want to call within your workflow, from the drop-down list. The list displays all processes defined for the selected Application Package.

4. Click **Save** to save the sub pipeline details.

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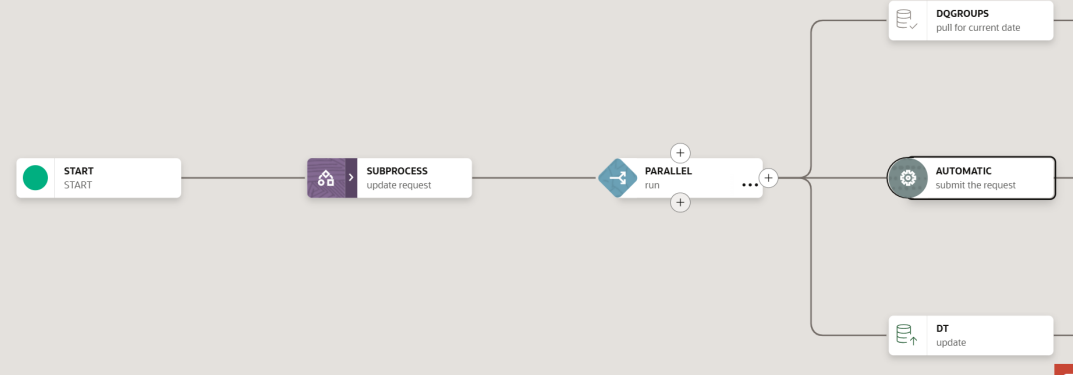
Figure 1-7 Create Sub run pipeline



Click > icon in the Sub process to view the Sub run pipeline details.

To copy an activity, click the **More** icon in the source activity and select **Copy activity** from the available list and choose the node where you wish to paste this activity. Click the **Add** icon and select **Paste activity**. All the relevant details of the copied activity are available in the newly added activity.

To delete an activity, click the **More** icon in the activity that you wish to delete and select **Delete activity** from the available list.

Figure 1-8 Sub Process details

1.5.4 Add a Data Field from the New User Interface

1. On the **Process Modeler** page, click the pipeline to which you want to add a Data Field.
2. Select **DataFields** from the header to display the **Data Fields** window.
3. Click **Create** to display the **Addition of Data Field** window.
4. Provide the details described in the following table and click **Save** to save the details:

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Table 1-3 Data Field Details Description

Field Name	Description
Data Field Code	Enter the Variable Name/Code, which will be used to read or write into this variable. This field is non-translatable.
Data Filed Name	Enter the name of the Data Field.
Data Field Description	Enter a brief description.
Data Field Type	Select the Data Field Type.
Initial Value	Enter the initial value for the data.
Is Mandatory	Applies to the **AOM** Data Field Type. **Yes** is the default selection for AOM.
Scope	Select the scope of the Data Field. Options are: • **Process** - To use the Data Field only in the current process. • **Package** - To use the Data Field across all the processes in the package.

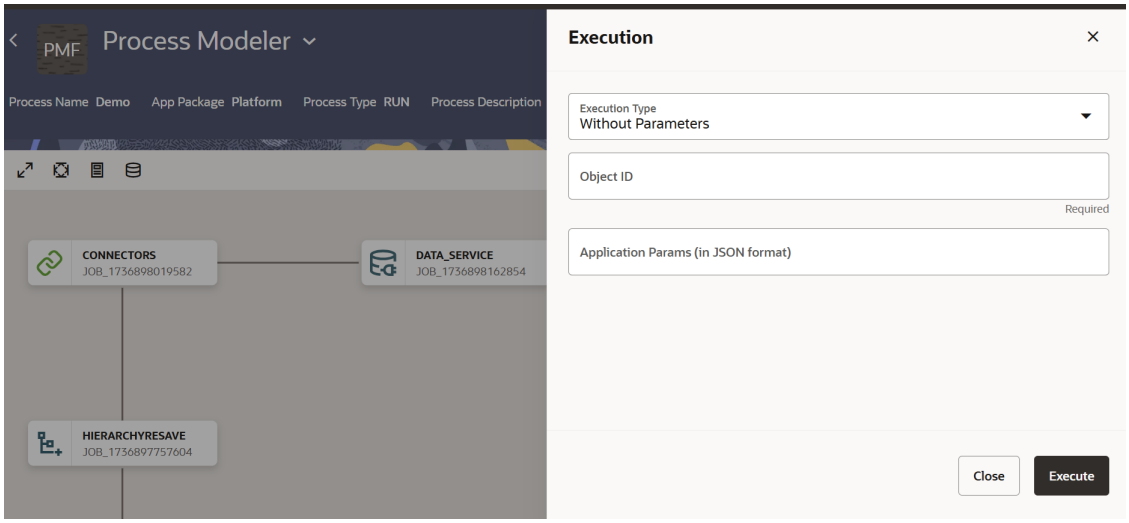
For more information on the data fields and the system data fields, see Data Fields.

1.5.5 Executing Run Pipeline from the New User Interface

After creating your Run pipeline, your next step is to execute it. To execute a Run pipeline, complete the following steps:

1. From the **Process Modeler Summary** page, click the Actions button corresponding to Run pipeline you want to execute and select **Execute Run**. The **Execution** window is displayed.
2. Select the **Execution Type**, enter the required fields and click **Execute**.

Figure 1-9 Execute a Run pipeline using New UI



The execution is triggered using the selected FIC MIS DATE. The RUNSKEY is generated and inserted into the “DIM_RUN” table. For the RUNSKEY generated, the corresponding user-selected parameters are inserted into the “RUN_EXE_PARAMETERS” table.

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You can use the Process Flow Monitor to view the status of the execution as the Run pipeline is executed.

1.5.6 PMF Dashboard for New User Interface

When there are multiple pipelines running in parallel, monitoring the processes to find out if they have executed successfully or otherwise, information about the tasks within pipelines that have completed, failed, canceled, and in-progress yet becomes important.

The Process Modeling Framework (PMF) Dashboard displays granular level execution details of all PMF processes belonging to Loader components and Data Quality executions within a environment (tenancy). Only authorized users belonging to the Accounting Foundation Admin Group or Accounting Foundation Operations User Group will have access to the PMF Dashboard. For each PMF process, these authorized users can drill down and view the related activities and further into the events recorded for each activity along with information such as the timestamp, event messages, and event error codes. This information aids you to gauge the progress made by each task. You also have the option to monitor a pipeline and view it on the PMF canvas.

Navigation to the PMF Dashboard page is through the drop down on the Process Modeler page. On the dashboard page, you can view detailed information about the processes that have run and the details of the events (activities) that have occurred during the execution of the tasks.

You have options to search the activities and tasks: for example, completion status, Process ID, or execution date. You can also export the results as a report to an Excel or CSV format.

1.5.6.1 View and Filter PMF Dashboard for the New User Interface

The PMF Dashboard displays detailed, drill-down information about the processes that have run and the details of the events (activities) that have occurred during the execution of the tasks. You can use the filters provided to quickly search and locate a PMF Process that has run regardless of whether process completed or failed.

> **Note**
>
> The PMF Dashboard supports wildcard search where you can search for objects without having to provide the complete activity name, process name, or instance ID. In addition, the search feature is case-agnostic; you can type the search strings in upper or lower case.

To view and filter the PMF Dashboard:

1. From the **AFCS Home** page, select **Process Orchestration**.

   The **Process Modeler** page is displayed.
2. Click **Switch to the New UI** link and the new Process Modeler page is displayed.
3. Click the **Process Modeler** drop down and select the **Dashboard** option. The **Process Dashboard** page appears and displays the PMF processes that have run.
4. You can filter the PMF dashboard to quickly search for a PMF process you are interested in. Note that the search is case-sensitive. The following filter options are available:
   - **Process Status**: Select one or multiple statuses to filter the PMF dashboard. For example: to see all processes that have failed, click **Process Status** under the search bar and select **Failed** to view a list of all the processes that have failed.

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- **Run Purpose**: Enter the run purpose value or select the Run purpose using the search bar to list the processes with a specific run purpose details.
- **Process Name**: Enter the process name.
- **Process ID**: Enter the process ID.
- **Process Instance ID**: Enter the process Instance ID.
- **More Filters**: Select from one of the multiple options available.
- **Execution Date**: Select a time period or a date range based on the time zone in which the user is logged in.

Additionally you can select **Run Purpose** option to filter the records specific to Run Purpose.

The dashboard is refreshed and the PMF process(es) matching your filter criteria are displayed.

5. You can drill-down each PMF process to view the activities (tasks) that have been defined for that process. Use the additional filters to filter activities based on **Activity**, **Activity ID** , **Event Parameters**, **Event Message**, and **Event Error Code**. To apply a filter, click inside the search bar, select the filter, and press Enter.
6. Each PMF process has the following information:
   - **Process Instance ID**: The unique system-generated value that identifies the process instance.
   - **Data Source ID**: The Data Source ID of the process.
   - **Run Params**: The input parameters provided to execute this process.
   - **Run Purpose**: The Run purpose of the execution.
   - **As Of Date**: The As of date.
   - **Run Skey**: The unique number created for each instance.
   - **Start Time**: Start time of the process execution.
   - **End Time**: End time of the process execution.
   - **Duration**: Duration of the process execution.
   - **Status**: Indicates if the process has completed, failed, was canceled, or is still running.
   - **Monitor**: Click this icon to view the progress of this process on the PMF canvas.
7. Click the PMF process link to drill down and display the activities associated with this process. The associated activities (for example: SCD, Connectors, Run DQ Rule, and so on) are displayed. For each activity, the following information is available:
   - **Component**: The component type.
   - **Start Time**: Start time of the activity execution.
   - **End Time**: End time of the activity execution.
   - **Duration**: Duration of the activity execution.
   - **Status**: Indicates if the activity has completed, failed, was canceled, or is still running.
8. Click the activity name link to drill down further and view details of the events within this activity. For example: if the activity is an **Insert Connector**, the following event information is displayed:
   - **Timestamp**: The latest record is displayed on top.
   - **Number of error records**: The number of error records.

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- **Event**: The event that is being recorded.
- **Volume Number of records loaded**: The number of records that were loaded.
- **Event message**: Status of the event completion.

1.5.7 Scheduler Services for a PMF Process

Scheduler integration with the PMF is a key functionality which allow users to schedule a PMF Process from the PMF Canvas or the Process Modeler Summary page. This integration focuses on the functionalities such as, Create, View, Edit and Delete the schedules within the PMF.

You can schedule the execution only for a Run pipeline and not for a work flow or a for a Sub run pipeline.

1. You can select a specific process from the Process Modeler summary page, under **Actions** drop down, click **Schedule** or from the PMF canvas page, click the **Scheduler** icon.

   The Scheduler summary window is displayed.
2. Click **Create Schedule** to create a scheduler for the selected PMF process.
3. You can schedule a process to execute Once, Daily, Weekly, Monthly, Quarterly and Cron. Based on selection, enter the required fields and click **Continue**.
4. Click **Continue** and the Execution window is displayed.
5. Select the Execution Type as **With Parameters** from the drop down list, enter information in the required fields and click **Schedule**.

   Process execution scheduled successfully message is displayed.
6. You can click on the **Scheduler** icon to view the Scheduler Summary page and the newly added schedule details are displayed.

1.5.8 Process Monitor for the New User Interface

Use the Process Monitor to monitor the current stage of a process. After integrating with a service, a workflow is invoked. After it is invoked, the workflow goes through all the defined stages. Using the Process Monitor, you can view all the stages of the workflow such as current stages, stages to follow, if any, and finished.

Your User Group must be mapped to the Function Role WFMACC (Workflow Monitor Access) to access the Process Monitor.

From the **Process Modeler** drop down, click the Process Monitor option to view the Process Monitor page. All workflows that are invoked from the service are displayed along with details such as **Entity Name**, **Object ID**, **Process Code**, **Process Name**, **Process Description**, **As of Date**, **Execution Start Time**, **Executed By**, **Status**, **Run Purpose** and so on.

> **Note**
>
> You can use the **Columns** button to display the column details that you wish to view in the summary page.

To monitor only a selected pipeline, on the Process Modeler summary page, click the **Actions** button corresponding to that pipeline and select **View**. The execution details are displayed.

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Click the Actions button corresponding to the selected pipeline to view options to:

- Resume: To resume a Run pipeline.
- Re-run: To execute a Run pipeline again irrespective of the previous execution status.
- Abort: To abort an ongoing Run pipeline.
- Launch a new window.
- View: To view the execution details.

> **Note**
>
> In case of Disaster recovery (DR) after switch over to the secondary site, the processes that are in running status should be aborted and resume to proceed further.

To return to the Process Modeler page, select the Process Modeler option from the Process Monitor drop down.

Use the **Search** field to search for a specific pipeline by providing a keyword from either the Object ID, Process Name, or Process Description of the process you are looking for and click **Search**.

1.5.8.1 Monitoring a Process from the New User Interface

From the **Process Monitor** window, click the Object ID link corresponding to the process you want to monitor.

The status of the activity is represented as: **Completed**, **Failed**, **Cancelled**, or **Running**.

You can also set auto-refresh in the header. Select **Enabled** in **Auto Refresh**, enter a value from 1 to 10 in **Refresh Interval (In Min)**.

1.6 Designing and Executing Pipelines

You can design and execute pipelines using the Process Modeller.

1.6.1 Process Modeler

The **Process Modeler** page provides a comprehensive overview of existing pipelines along with key details such as process ID, process name, description, version, instance, application, last modified date, and the user who last modified it.

On this page, you can perform the following actions:

1. **Create a New Pipeline**: Click the **+** icon to design a new pipeline.
2. **Edit an Existing Pipeline**: Click the process name link to open and modify the pipeline.
3. **Launch a Process**: Open the pipeline in a new window.
4. **Delete a Pipeline**: Remove an unwanted pipeline.
5. **Access the Menu Options** for individual pipelines to:
6. View the process flow.
7. Copy the process flow.

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8. Monitor the pipeline in the **Process Flow Monitor** window.
9. Execute the pipeline.
10. Apply filter conditions to a **Run Pipeline**.

Additional functions include:

- **Search**: Use the search grid to find pipelines by entering keywords such as process ID, process name, or description. The reset icon clears the search fields.
- **Pipeline Filters**: Refine search results using the **Pipeline Filter** options. For instance, to display only Run Pipelines, select **Run Pipeline** in the filter and remove other types if selected.
- **Sorting**: Sort pipelines by process ID, process name, or application using the **Sort By** drop-down.

Navigation to Process Monitor: Easily access the **Process Monitor** window for detailed monitoring.

1.6.2 Canvas and Components

The Process Flow Tab has a toolbar and canvas. The canvas is used to design the process flow with the LHS toolbar consisting of Tools, Activities, and Widgets. Drag these components and drop them into the canvas, connect them, and configure each component to design your process flow.

1.6.2.1 Service Task

A Service Task invokes an application component (for example, activity to invoke a business rule to calculate a certain threshold). It is an automatic task that gets triggered in the process flow and is typically used to execute the business logic that is defined through an **Execution Rule** type application rule.

Service Tasks are used to invoke an External Model Service through stored procedures and functions.

Figure 1-10 An Example: Service Tasks Flow

1.6.2.1.1 How to Use a Service Task

1. Expand the Activity section in the toolbar on the left, then click and drag the **Service Task** icon onto the canvas.

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2. Double-click the **Service Task** component on the canvas to open the **Job Configuration** window.

1.6.2.1.1.1 Job Configuration

Job Configuration refers to the process of defining and setting up the parameters, settings, and resources required for a specific job or task to be executed within a system. This configuration ensures that the job runs according to specified requirements, including input data, processing steps, dependencies, and output handling. Job configurations are essential for automating tasks, managing workflows, and ensuring that jobs execute in a controlled and efficient manner within a larger process or system.
For more information, see How to Use Parallel Gateways.

1.6.2.1.1.1.1 Activity Tab

1. **Activity ID** is auto-populated and you can mouse-over the **i** icon to view it.
2. By default, the activity ID is populated in the name field. You can enter your own **Activity Name** and **Activity Description**.
3. The **Activity Type** is selected by default depending on the Activity ID.
4. Select **Status** to determine the current state of the activity (e.g., Pending, In Progress, Completed). It helps track the activity's progress.
5. Select **Outcomes** to specify the potential results or conditions of the activity. It determines the next steps based on the activity's completion (e.g., Success, Failure, Skipped).
6. Click the check mark icon to save.
7. Click anywhere outside the configuration window to close it.

1.6.2.1.1.2 Implementation Tab

1. Click the **Implementation** tab on the configuration window.
2. Click the search icon to select the **Execution Rule** that has to be executed for this activity. The **Participant Details** window is displayed with all **Application Rules** of type **Execution Rule** available in your process.
   - Click the name link of the Application Rule to view its details.
   - Select the required rule and click the **check mark**.
   - Click outside the window to return to the configuration window.
3. Add **Parameters** you want to pass to the Execution Rule.
   - Click **+** next to **Parameters**. The **Participant Details** window is displayed.
   - Select the **Data Fields** to which you want to pass the value. This list displays all data fields for the current process or package.
   - Select the **Parameter Type**. Choose **Static** if you want to pass a static value to the selected data field. Enter the **Value**. Choose **Dynamic** to pass the value during the execution of the workflow.
   - The parameters you added are displayed under the **Parameters** in the **Implementation** tab.
4. Select the **Pre Rule**, which is the Application Rule you want to execute before executing the Execution Rule. Click the corresponding search icon to select the Application Rule that you want to set as the pre rule.
5. Select the **Post Rule**, which is the Application Rule you want to execute after executing the Execution Rule. Click the corresponding search icon to select the Application Rule that you want to set as the post rule.

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6. Click **Save**.
7. Click anywhere outside the configuration window to close it.

1.6.2.1.1.1.3 Transition

The Transition component is used to control the flow between various components in the Process Flow. Transition connects two activities and the flow is configured based on a Conditional Expression or Decision Rule.

To configure Transition details, follow these steps:

1. Click the **Transition** tab.
2. Click the **+** icon to display the **Add New Transition from Node** window.
3. Select the required job to be connected to from the **Connected To** drop-down.
4. Enter a name for the transition in the **Transition Name** field.
5. Enter the order of execution in the **Order** field. For example, 1 marks the order as to be executed first.
6. Click the **Search** icon from the **Decision Rule** drop-down and select the required application rule.
7. Depending on the Execution Type, enter the required details.
8. Click the **check mark** icon to save the details.
9. Select the stroke format from the **Stroke** drop-down.
10. After entering the details, click the **check mark** icon to save the entered details.

1.6.2.1.1.1.4 Action

- **Access Action Tab**: Click on the **Action** tab on the configuration window.
- **Set Group Approvals and Routing Policy**: To configure the **Group Approvals** and **Routing Policy**, click the **Group Approval** button.
- Select the Voting Policy depending on the selected Routing Policy.
- The available routing policies are Parallel and Sequential.
- **Add Options**: Click the **+** icon to open the available options for configuring the policy. These options include:
  - **Task Details**: Allows you to define the tasks and parameters related to the group approval. To select an appropriate **Condition**, refer to the **Application Rule** section for more information.
  - **Expiry**: Lets you set an expiration date for the task or approval.
  - **Escalation**: Provides the option to escalate the task if it is not completed within a certain timeframe.
  - **Email**: Option to send emails regarding the task, such as notifications or updates.
  - **Reminder**: Allows you to set a reminder for follow-ups or pending actions.

1.6.2.1.1.1.5 Notification

You can set up notifications by configuring the following parameters:

1. **Access the Notification Group Configuration**: Navigate to **Activity Details > Notification Group**
2. **Review or Enter Notification ID and Name**
   - **Notification ID:** Auto-generated

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- **Notification Name:** Enter a descriptive name

3. **Define the Condition (Optional)**
   - Click in the **Condition** box.
   - Optionally, input a condition that determines when the notification should be triggered.
   - Use the search icon to look up available conditions if needed.
4. **Select When to Generate the Notification**
   - In the **Generate** dropdown, choose from:
     - On Entry
     - On Stage
     - On Exit
     - On Escalation
     - On Reminder
5. **Set Notification Status**
   - **Enabled:** Choose **Yes** or **No** to enable or disable the notification.
6. **Configure Email Settings (Optional)**
   - **Email Required:** Choose **Yes** if an email should be sent.
     - If **Yes** is selected:
       * Select an **Email Template** from the dropdown:
         * Global Task Template
         * Default Task Template
7. Click the **checkmark** icon at the bottom right to save the configuration.

1.6.2.2 Transition

The Transition component is used to control the flow between various components in the Process Flow. Transition connects two activities and the flow is configured based on a Conditional Expression or Decision Rule.

1.6.2.2.1 Gateways

A **gateway** is a decision point in a process flow where the flow can diverge or converge, directing the flow of execution based on certain conditions or rules. Gateways are used to control the path that process flows take depending on the logic of the process. They are essential for splitting or merging transitions in a workflow.

There are several types of gateways, each serving different purposes:

- **Parallel Gateway**: This type of gateway is used when multiple transitions or flows need to be executed simultaneously. It ensures that all outgoing flows are triggered at the same time, allowing parallel execution.
- **Sequential Gateway**: This gateway is used when multiple transitions or flows need to be executed in a specific, sequential order. The outgoing flows are triggered one after the other, following a predefined sequence.

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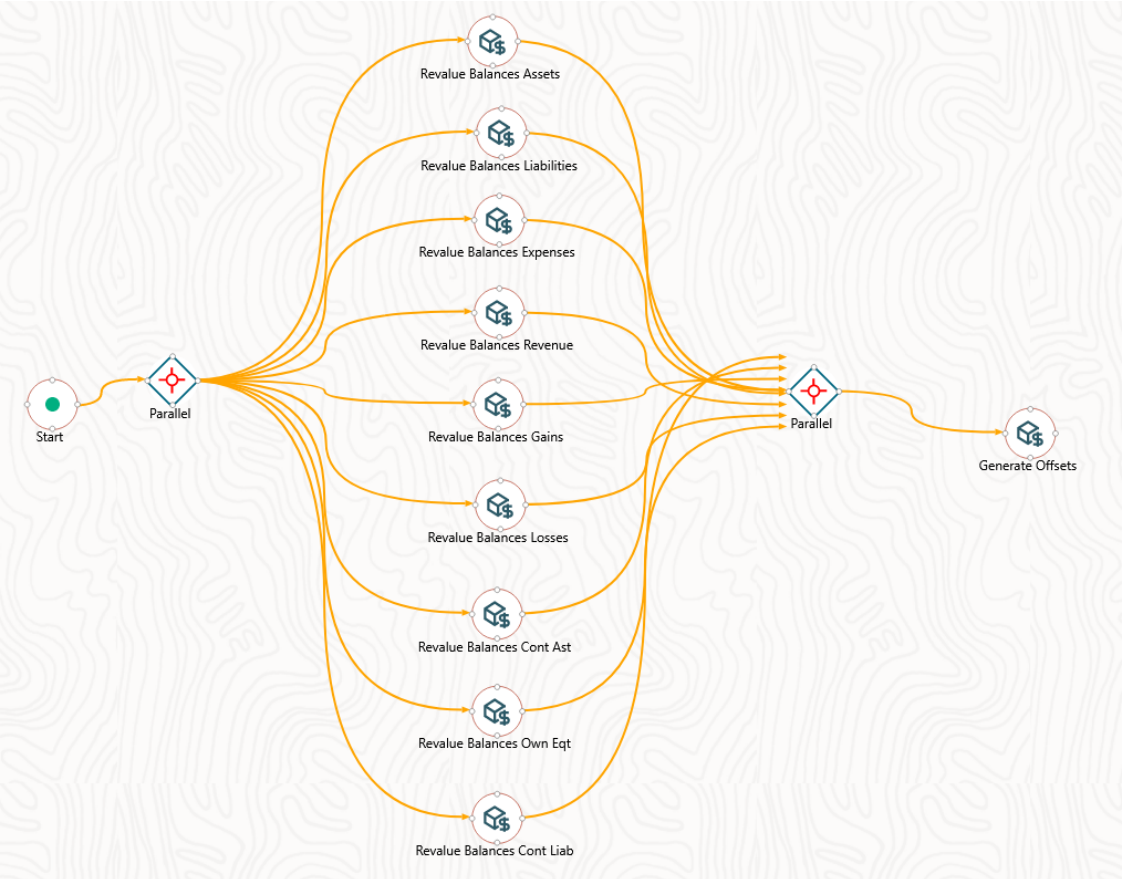
- **Multi Choice Gateway**: A Multi-Choice Gateway is used when different transitions or flows are chosen based on a decision rule. It allows the process to branch into multiple paths depending on the conditions or rules applied at the gateway.
- **Connector**: A Connector helps connect two activities with a different path (other than the default), in case the default path is overlapping an existing flow.

> **Note**
>
> If you use a Parallel or Multi Choice Gateway in your pipeline, ensure that after all the activities are added to these gateways, they are merged or closed again with a Parallel or Multi Choice Gateway, respectively. If there is no more activity to be performed after the Parallel or Multi Choice Gateway, it is mandatory to add an empty service task activity. Otherwise, the status is not updated correctly and the next activity execution does not happen.

1.6.2.2.1.1 Executing Parallel Tasks

A Parallel Gateway is used to execute multiple tasks in parallel. In the usual flow, tasks are executed sequentially.

Figure 1-11 Executing Parallel Tasks flow



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In the example shown, when the Parallel Gateway is invoked, all the OFSAA components that are placed between Parallel Gateways, are executed simultaneously. After all components are executed, the execution moves to the next activity in the Process Flow.

> **Note**
>
> In case if any one of the task fails as part of parallel gateway, the other ongoing parallel tasks executions are completed. The status of the activities get updated appropriately even though one or more activities fail.

Table 1-4 PMF Run Pipeline Design

Do's for a Gateway (Parallel and Multichoice)	Dont's for a Gateway (Parallel and Multichoice)
Ensure to begin and end with the same gateway during run pipeline design.	A parallel gateway cannot exist within another parallel gateway.
Ensure to add a service task if a parallel gateway is the last executing activity.	Multiple transitions are not supported for any activity in a run pipeline. Therefore, you must only use a parallel gateway.
Tasks which start from a parallel gateway must end in the successive closing parallel gateway.	
Execution of a pipeline will begin from the **Start** activity. Therefore, the transition cannot be stopped for this activity.	

1.6.2.2.1.1.1 How to Use Parallel Gateways

This section explains how to design parallel tasks using Parallel Gateways. For example, executing the Reconciliation widget in parallel for different rules.

1. Create a process in the Process Modeler canvas.
2. On the **Process Flow** page, you will see a **START** activity is already present on the canvas. This activity indicates the beginning of the process.
3. From the LHS menu, under **Transition**, click and drag a **Parallel Gateway** widget on to the canvas.
4. Connect the **START** activity with this **Parallel Gateway** widget.
5. Drag and drop the widgets representing the tasks that run in parallel on to the canvas. Example: add multiple Reconciliation widgets on to the canvas.
6. Connect the Parallel Gateway widget with each of these widgets representing tasks that must run in parallel. This represents the beginning of the transition.
7. Drag and drop another Parallel Gateway widget on to the canvas.
8. Connect each of the Reconciliation widgets to this newly added Parallel Gateway widget. This represents the end of the transition.
9. Configure the Reconciliation widgets based on your requirement.
10. Continue following this process to create your pipeline, which may include one or more parallel tasks.
11. Click **Save** to finalize the changes.

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1.6.2.3 Connector

A Connector helps connect two activities with a different path (other than the default), in case the default path is overlapping an existing flow.

1.6.2.4 Widgets

Widgets are used to execute Connectors, Data Service, and Event Posting.

1.6.2.4.1 How to Use a Widget

1. On the **Process Flow** page, expand the toolbar on the left, click and drag the required widget icon under **Widget** on to the canvas.
2. Double-click the widget to open the configuration window for the widget. The **Activity** tab is selected.
3. Enter the **Activity Name** and **Activity Description**.
4. Specify the **Dynamic Parameters** for the widget.

1.6.2.4.1.1 Dynamic Parameters for Widgets

- Amount Translation
- Data Services
- OBIEEPC RELATION
- RUN DQ RULE
- HIERARCHY RESAVE
- Connector
- DQ Reporting Engine
- Reconciliation
- SCD (Slowly Changing Dimensions)
- Balance Computation

1.6.2.4.1.2 SCD (Slowly Changing Dimensions)

The Slowly Changing Dimension (SCD) widget enables you to process master-data changes using either full or incremental loading strategies. The widget supports snapshot loading, incremental updates, node retirement, and dimension reactivation based on SCD configuration parameters.

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> **Note**
>
> If you have entered the **Full Load** parameter as **YES**, you can load snapshot data for master tables and execute SCD process with additional parameters.
> In case, when you have entered the **Full Load** parameter as **YES** and if the load is incremental and does not contain all the nodes, those nodes are retired by default.
>
> When entered as **NO**, you can load incremental data for master tables and execute SCD process with additional parameters. The incremental data load for master tables is supported.
> The retired dimensions can be brought back as part of subsequent SCD load by updating the Closed Flag column to null or 'N'.

Current behavior of Disabled Nodes:

- The Closed Flag attribute is not supported for the Product Processor (PP) accounts.
- A new node in the Stage Master table with Closed Flag 'Y' is supported and will be ignored during SCD load.

To configure this widget, complete the following steps:

1. On the **Process Flow** page, from the LHS menu, expand **Widget** and drag and drop this widget on to the canvas.
2. Double-click the widget on the canvas. The configuration window is displayed with the **Activity** tab selected.
3. Under **Dynamic Parameters**, configure the settings described in the following table.
4. Click the tick mark icon to save your changes. To close the configuration window, click anywhere outside the window on the canvas.

Table 1-5 Dynamic Parameters for SCD Description

Property	Description
Datastore Name	Refers to the name of the Information Domain. By default, the Information Domain to which you are connected is selected.
Name	Select the name of the required dimension table.
Full Load	If you have entered the **Full Load** parameter as **YES**, you can load snapshot data for master tables and execute SCD process with additional parameters. When entered as **NO**, you can load incremental data for master tables and execute SCD process with additional parameters.
Execution Venue	Enter name of the Execution Venue. This field is case-sensitive and must be unique. For example, logical name “R_DF” is not allowed if a name “R_DF” exists. Ensure that there are no special characters such as `, {,},”, ‘, ~, <,>, /, \, and multiple spaces.
Effective Date	Enter the start date from when the data is valid.

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1.6.2.4.1.3 RUN DQ RULE

To configure this widget, complete the following steps:

1. On the **Process Flow** page, expand **Widget** section in the LHS menu and drag this widget on to the canvas.
2. Double-click the widget on the canvas to open the configuration window with the **Activity** tab selected.
3. Under **Dynamic Parameters**, configure the settings described in the below table.
4. Select the check mark icon to save your changes. To close the configuration window, click anywhere outside the window on the canvas.

Table 1-6 Dynamic Parameters for RUN DQ RULE Description

Property	Description
Datastore Name	Refers to the name of the Information Domain. By default, the Information Domain to which you are connected is selected.
DQ Group Name	Select the required DQ group. The unique identifier name for the groups. The name should start with alphabet and should not be more than 50 characters.
Rejection Threshold	Inserts for previous tables will not be reverted. The Rejection Threshold is applied to each target table individually within a batch. By default, the Rejection Threshold is considered as 100 when no input is added. When the Rejection Threshold is set as 100 or blank, the whole data file will be loaded irrespective of the number of errors.

Note

The Rejection Threshold value should be a number which is considered as percentage of records. For example, if you have entered the value as 10, it is considered as 10 % of the entire records.

Note

The Threshold limit is not applicable for duplicate Data Quality Check.

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Table 1-6 (Cont.) Dynamic Parameters for RUN DQ RULE Description

Property	Description
Additional Parameters	Enter any additional parameters for the Run DQ Rule filtering criteria in the following format: Key#Data type#Value; Key#Data type#Value; and so on. **Note** If these additional parameters are not specified, the default value will be set to NULL. Except for the standard placeholders $MISDATE and $RUNSKEY, all additional parameters for DQ execution must be enclosed in single quotes. For example: `STG_EMPLOYEE.EM` P_CODE = '$EMPCODE'
Fail if Threshold Breaches	By default, the **Fail If Threshold Breaches** option is set to **TRUE** when no input is provided. If the threshold is breached and the **Fail If Threshold Breaches** field is set to TRUE, the job will abort, and the failure records will not be inserted into the DQ Result tables. If the threshold is breached and the **Fail If Threshold Breaches** field is set to **FALSE**, the job will continue, and the failure records will be inserted into the DQ Result tables.
Stop Insert on Threshold Breach	This is applicable only when **Fail if Threshold Breaches** is set to **FALSE**. When **Stop Insert on Threshold Breach** is set to **Y**, only the invalid records based on rejection threshold are inserted in the DQ Result tables. If set to **N**, all the invalid records are inserted. By default, it is set to **N**.
Rule Execution Connection	To establish a connection for DQ execution, enter the Rule Execution Connection as **STAGE**.
Result Store Connection	To store the Data Quality execution results, enter the Result Store Connection as **PREPROCESS**.
Batch on Fail	Leave this parameter blank.
Micro service Id	Enter the Micro Service ID.

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1.6.2.4.1.4 HIERARCHY RESAVE

Hierarchy Resave is the process of updating the hierarchy's data with either a complete replacement of existing data (Resave) or adding new data into the current hierarchy structure (Refresh). This ensures that the data remains accurate and up-to-date.
To configure this widget, complete the following steps:

1. On the **Process Flow** page, expand the **Widget** section in the left-hand menu. Then, drag and drop the widget onto the canvas.
2. Double-click the widget on the canvas to open the configuration window. The **Activity** tab will be selected by default.

Table 1-7 Widget Table

Field	Description
Activity Name	Enter a name for the activity in the **Activity Name** field (e.g., "HIERARCHYRESAVE").
Activity Description	Enter a description for the activity in the **Activity Desc** field. This helps to clarify the purpose or function of the activity.
Activity Type	Ensure the activity type is set to **HIERARCHYRESAVE** as shown in the image. This is typically auto-filled based on the widget type.
Status	Select the status for activity type.

3. In the **Dynamic Parameters** section, configure the settings as described in the table below.

Table 1-8 Dynamic Parameters for HIERARCHYRESAVE

Property	Description
Entity	Select one or more entities. Use the **Include All** icon to include all entities, or the **Exclude All** icon to exclude all entities
Hierarchy	Select one or more hierarchies. Use the **Include All** icon to include all hierarchies, or the **Exclude All** icon to exclude them.
Load type	Select the Load Type: • Resave - Existing data is replaced with the freshly populated data. • Refresh - Freshly populated data is added to the existing data.

4. Once you've configured the necessary settings, click the checkmark icon to save your changes. To close the configuration window, simply click anywhere outside the window on the canvas.

1.6.2.4.1.5 Dynamic Parameters for Connectors

To configure this widget, complete the following steps:

1. On the **Process Flow** page, expand **Widget** in the LHS menu, then drag and drop the widget onto the canvas.

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2. Double-click the widget on the canvas. The configuration window will appear with the **Activity** tab selected.
3. Under **Dynamic Parameters**, configure the settings as outlined in the table below.

Table 1-9 Dynamic Parameters for Connectors

Property	Description
Connector Name	Select the required connector from the drop-down list. The selected connector loads the data as mapped in the staging tables of the ledger into DFCS.
Variables	Enter the required variables.

4. Click the check mark icon to save your changes. To close the configuration window, click anywhere outside the window on the canvas.

1.6.2.4.1.6 Data Service

The **Data Service** widget is used to configure and manage data-related activities within a process flow. It allows users to define and execute operations involving data services.

To configure this widget, complete the following steps:

1. On the **Process Flow** page, expand the **Widget** section in the left-hand menu. Then, drag and drop the widget onto the canvas.
2. Double-click the widget on the canvas to open the configuration window. The **Activity** tab will be selected by default.
3. In the **Dynamic Parameters** section, configure the settings as described in the table below.

Table 1-10 Widget Table

Field	Description
Activity Name	Enter a name for the activity in the **Activity Name** field (e.g., "HIERARCHYRESAVE").
Activity Description	Enter a description for the activity in the **Activity Desc** field. This helps to clarify the purpose or function of the activity.
Activity Type	Ensure the activity type is set to **HIERARCHYRESAVE** as shown in the image. This is typically auto-filled based on the widget type.
Status	Select the status for activity type.

Table 1-11 Dynamic Parameters for DataService

Property	Description
Variables	Enter the required variables.
DataService Name	Select the required Data Service from the drop-down list.

1.6.2.4.1.7 Event Posting

To configure this widget, complete the following steps:

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1. On the **Process Flow** page, from the LHS menu, expand **Widget** and drag and drop this widget on to the canvas.
2. Double-click the widget on the canvas. The configuration window is displayed with the **Activity** tab selected.
3. Under **Dynamic Parameters**, configure the settings described in the following table.
4. Click the tick mark icon to save your changes. To close the configuration window, click anywhere outside the window on the canvas.

Table 1-12 Dynamic Parameters for EventPosting

Property	Description
Subledger Application	Select the required Subledger Application from the drop-down list.

1.6.2.4.1.8 BICC Retrieval

To configure this widget, complete the following steps:

1. On the **Process Flow** page, from the LHS menu, expand **Widget** and drag and drop this widget on to the canvas.
2. Double-click the widget on the canvas. The configuration window is displayed with the **Activity** tab selected.
3. Under **Dynamic Parameters**, configure the settings described in the following table.
4. Click the tick mark icon to save your changes. To close the configuration window, click anywhere outside the window on the canvas.

Table 1-13 Dynamic Parameters for BICCRetrieval

Property	Description
Extract Type	Select the required BICC extract type to load from the options in the drop-down list. Oracle Business Intelligence Cloud Connector (BICC) extracts business intelligence and other data in bulk and loads it into designated external storage areas.

1.6.2.4.1.9 Adjustment

To configure this widget, complete the following steps:

1. On the **Process Flow** page, from the LHS menu, expand **Widget** and drag and drop this widget on to the canvas.
2. Double-click the widget on the canvas. The configuration window is displayed with the **Activity** tab selected.
3. Under **Dynamic Parameters**, configure the settings described in the following table.
4. Click the tick mark icon to save your changes. To close the configuration window, click anywhere outside the window on the canvas.

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Table 1-14 Dynamic Parameters for Adjustment

Property	Description
Adjustment Rule	Enter the Adjustment Rule name.

1.6.2.4.1.10 Exchange Rates

To configure this widget, complete the following steps:

1. On the **Process Flow** page, from the LHS menu, expand **Widget** and drag and drop this widget on to the canvas.
2. Double-click the widget on the canvas. The configuration window is displayed with the **Activity** tab selected.
3. Under **Dynamic Parameters**, configure the settings described in the following table.
4. Click the tick mark icon to save your changes. To close the configuration window, click anywhere outside the window on the canvas.

Table 1-15 Dynamic Parameters for ExchangeRates

Property	Description
Exchange Rates Rule	Enter the exchange rates rule to apply to the transaction or set of data. The rule computes the rate to convert the value from one currency to another.

1.6.2.4.1.11 DQ Reporting Engine

The **DQ Reporting Engine** is a component or tool used for generating and managing Data Quality (DQ) reports. It processes data to assess its quality, identifies issues, and produces reports that help users monitor and improve the quality of their data.

To configure this widget, complete the following steps:

1. On the **Process Flow** page, from the LHS menu, expand **Widget** and drag and drop this widget on to the canvas.
2. Double-click the widget on the canvas. The configuration window is displayed with the **Activity** tab selected.

Table 1-16 Widget Table

Field	Description
Activity Name	Enter a name for the activity in the **Activity Name** field (e.g., "HIERARCHYRESAVE").
Activity Description	Enter a description for the activity in the **Activity Desc** field. This helps to clarify the purpose or function of the activity.
Activity Type	Ensure the activity type is set to **HIERARCHYRESAVE** as shown in the image. This is typically auto-filled based on the widget type.
Status	Select the status for activity type.

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3. Under **Dynamic Parameters**, configure the settings described in the following table.

Table 1-17 Dynamic Parameters for DQReportingEngine

Property	Description
DQ Reporting Rule	Select the DQ Reporting Rule from the Run DQ rule job that you wish to use for validation of the data.

4. Click the check mark icon to save your changes. To close the configuration window, click anywhere outside the window on the canvas.

> **Note**
>
> Post execution, you should perform a fresh execution from the PMF pipeline. It is not recommended to perform a re-run operation once the execution is complete.

1.6.2.4.1.12 Reconciliation

The **Reconciliation** widget is used to configure and automate the process of reconciling transactions and generating statements. The configuration ensures that financial or transactional data is accurately compared and balanced.

To configure this widget, complete the following steps:

1. On the **Process Flow** page, expand the **Widget** section in the left-hand menu. Then, drag and drop the widget onto the canvas.
2. Double-click the widget on the canvas to open the configuration window. The **Activity** tab will be selected by default.

Table 1-18 Widget Table

Field	Description
Activity Name	Enter a name for the activity in the **Activity Name** field (e.g., "HIERARCHYRESAVE").
Activity Description	Enter a description for the activity in the **Activity Desc** field. This helps to clarify the purpose or function of the activity.
Activity Type	Ensure the activity type is set to **HIERARCHYRESAVE** as shown in the image. This is typically auto-filled based on the widget type.
Status	Select the status for activity type.

3. In the **Dynamic Parameters** section, configure the settings as described in the table below.

> **Note**
>
> The Transition component is used to control the flow between various components in the Process Flow. Transition connects two activities and the flow is configured based on a Conditional Expression or Decision Rule.

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Table 1-19 Dynamic Parameters for Reconciliation

Property	Description
Rule Name	Select the Rule Name to apply during execution for reconciling transactions and generating statements.

4. Click the check mark icon to save your changes. To close the configuration window, click anywhere outside the window on the canvas.

1.6.2.4.1.13 Balance Computation

This screen allows you to associate and manage notification rules and participants with the Balance Computation activity. Notifications define the conditions under which alerts are triggered, while participants determine who receives the alerts or is involved in the process. You can configure multiple notification rules and assign relevant participants to ensure timely communication and action.

- **ID:** Links to the notification job
- **Name:** Custom name of the notification
- **Condition & Generate:** Describe when and how the notification should be triggered
- Click **+** icon to define the parameters.
- **ID:** System-generated unique identifier for the notification entry (default is 0 for new entries).
- **Decision Rule:** Logic that determines whether the notification should be sent.
- **Role Code:** Defines the functional or organizational role for filtering the recipient (optional).
- **User Type:** Specifies how the recipient(s) will be selected:
  - **None** – No recipients will be added.
  - **User** – A specific user is selected manually.
  - **Rule** – Recipients are selected based on a predefined rule.
  - **User Group** – Notification will be sent to all members of a selected group.

1.6.2.4.1.14 Amount Translation

The **Amount Translation** activity is used to convert monetary amounts from one currency to another within a financial processing workflow. This setup allows defining the activity name, status, and any additional comments needed for tracking or configuration purposes.

- **Activity Name:** The label or identifier for this specific translation task.
- **Activity Description:** Optional text to describe the purpose or scope of this activity.
- **Activity Type:** Predefined and fixed as AmountTranslation to denote this function.
- **Status:** Dropdown to set the current operational state (e.g., Active, Inactive, Pending).
- **Dynamic Parameters – Comments:** Field to capture any additional remarks or notes relevant to this translation activity.

1.6.2.4.1.15 OBIEEPC RELATION

This widget defines relationships within business intelligence or data hierarchy structures.

1. In the **Activity Name**, enter the Name. For example: OBIEEPCRELATION.

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2. (Optional) Enter a description in **Activity Description** field.
3. Under **Dynamic Parameters**, open the **Dimension Hierarchy Entity** dropdown.
4. Choose one of the following:
   - General Ledger Hierarchy Dimension
   - Legal Entity Hierarchy Dimension
   - Line Of Business Hierarchy Dimension
   - Organization Unit Hierarchy Dimension
   - Account Hierarchy Dimension
5. Click the **checkmark** to save.

1.6.2.4.1.16 Missing Master Loader

- A new widget named **Missing Master Loader** is now available in the PMF screen under **Data Foundation** App package ID.
- This widget can be appended with the existing custom PMF runs or it can be set as a separate PMF run.

To configure this widget, complete the following steps:

1. On the **Process Flow** page, from the LHS menu, expand **Widget** and drag and drop this widget on to the canvas.

1.6.3 Design a Pipeline

In **Financial Services Data Foundation Cloud Service for Banking**, pipelines are used to design and execute a sequence of tasks—either **Financial Services Data Foundation Cloud Service for Banking** tasks or external tasks—that lead to a well-defined outcome. This flow is created by utilizing various components available in the **Financial Services Data Foundation Cloud Service for Banking** component toolbar. Using the **Process Modeler**, you can orchestrate and run pipelines by modeling data pipelines.

1.6.3.1 Run Pipeline

A Run Process is used to create a Run Definition in the Rule Run Framework (RRF). A Run Pipeline is the visual representation of the Run enabled through Process Orchestration.

An Example of Run Pipeline

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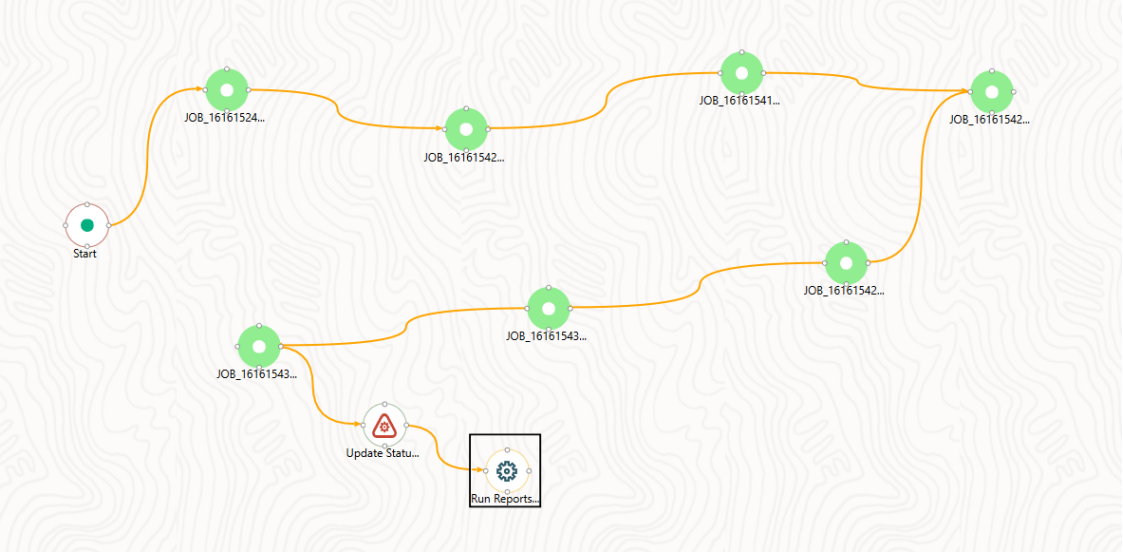
Figure 1-12 Run Pipeline Example



1.6.3.1.1 Creating a Run Pipeline

1. Click the **+** icon in the **Process Modeler Summary** page.

Table 1-20 Process Details

Field	Description
Process ID	The **Process ID** is automatically generated and unique for each process. This ID identifies the specific process within the system.
Process Name	Enter the name of the process. This will help users identify the process within the application.
Process Description	Provide a brief description of what this process does, to give context and help other users understand its purpose.
App Package ID	The **App Package ID** refers to the identifier for the application package that contains the process. In this case, it is set to "FSDF Components."
Registered Topics	This field allows the selection or listing of topics that are registered in the system. Topics could refer to areas of data or categories the pipeline will work with.
Spark DB	The **Spark DB** option indicates whether or not the process is using **Apache Spark** for database operations. Here, it is set to "No," meaning Spark is not being used.
Tag	This is an optional field where tags can be added for better categorization or to facilitate searching for this process in the future.

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Table 1-20 (Cont.) Process Details

Field	Description
Service ID_Workspace	This shows the **Service ID_Workspace** associated with the process. The service is identified as **Oracle Financial Services Data Service for Analytics**, which suggests this process is related to data services for financial analytics.

2. Click the **check mark** icon to save the entered details.

   The Process Flow canvas is displayed.

3. By default, the START activity appears on the canvas indicating the beginning of the process.
4. Drag and drop components from the toolbar on the left. You can drag and drop service tasks, gateways, connectors, and widgets on the canvas.
5. To connect one component with another, right-click the source component and choose **Start Link**. Next, click on the destination component and click **End Link**. Alternatively, if you drag and drop a component on another component on the canvas, the two components will be linked.
6. Proceed to link all the components per your requirement.
7. Click **Save**.

1.6.3.1.2 Creating and Executing a Custom DQ Run Pipeline

1. Click the **+** icon in the **Process Modeler Summary** page.

Table 1-21 Process Details

Field	Description
Process ID	The **Process ID** is automatically generated and unique for each process. This ID identifies the specific process within the system.
Process Name	Enter the name of the process. This will help users identify the process within the application.
Process Description	Provide a brief description of what this process does, to give context and help other users understand its purpose.
App Package ID	The **App Package ID** refers to the identifier for the application package that contains the process. In this case, it is set to "FSDF Components."
Registered Topics	This field allows the selection or listing of topics that are registered in the system. Topics could refer to areas of data or categories the pipeline will work with.
Spark DB	The **Spark DB** option indicates whether or not the process is using **Apache Spark** for database operations. Here, it is set to "No," meaning Spark is not being used.

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Table 1-21 (Cont.) Process Details

Field	Description
Tag	This is an optional field where tags can be added for better categorization or to facilitate searching for this process in the future.
Service ID_Workspace	This shows the **Service ID_Workspace** associated with the process. The service is identified as **Oracle Financial Services Data Service for Analytics**, which suggests this process is related to data services for financial analytics.

2. Click the **check mark** icon to save the entered details.

   The Process Flow canvas is displayed.

3. By default, the START activity appears on the canvas indicating the beginning of the process.
4. Drag and drop the **RUN DQ Rule** process widget.
5. To connect one component with an other, right-click the source component and choose **Start Link**. Next, click on the destination component and click **End Link**. Alternatively, if you drag and drop a component on another component on the canvas, the two components will be linked.
6. Proceed to link all the components per your requirement.
7. Double click the **RUN DQ Rule** process widget to enter the details. For more information on the parameters, see RUN DQ RULE section.
8. Click **Save**.
9. Execute the Custom DQ Run Pipeline. For more details on how to execute a pipeline, see Run Pipeline.

1.6.3.2 Additional Functionalities

This section describes how to manage pipelines including tasks such as viewing, modifying, copying, or deleting pipelines.

1.6.3.2.1 Modifying a Pipeline

This option enables you to modify a pipeline. To modify a pipeline, complete the following steps:

1. On the **Process Modeler** window, search for the pipeline and click the pipeline name. The **Process Flow** tab is displayed.
2. Modify the process flow, definition, application rules, or data fields as required.

> **Note**
>
> If you try to delete a component in the Business Pipeline that is used as a Sub Pipeline, a confirmation message is displayed. After you confirm the deletion, an alert is displayed with the list of the Business Pipelines where the Sub Pipeline is used. Click **OK** again to delete the component.

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1.6.3.2.2 Viewing a Pipeline

Use this option to view the workflow of an existing business process.

From the **Process Modeler** window, click the more information icon (the three horizontal dots icon) to view the sub-menu and select **View**. The Process Flow of the selected pipeline is displayed.

You can also **View** the pipeline in a new window by clicking on the **Launch in a new window**.

1.6.3.2.3 Copying a Pipeline

Use the copy option to quickly create a new business process based on an existing process by updating the process flow or other required details.

To copy a business process, complete the following steps:

1. From the **Process Modeler** window, click the more information icon (the three horizontal dots icon) to view the sub-menu of the selected pipeline and select **Copy**.

   The **Process Flow** window appears.
2. In the **Process Details** window, enter a unique **Process ID**, **Process Name**, and **Process Description**. If you select the same **App Package ID**, then **Data Fields** and **Application Rules** are also copied.
3. Enter a **Tag** for the Process ID.
4. Select the **Service ID_Workspace** from the drop-down list.
5. Click **check mark** to save the copied pipeline.

1.6.3.2.4 Deleting a Pipeline

Use this to delete a Business Pipeline or Run Pipeline.

To delete a pipeline, complete the following steps:

1. From the **Process Modeler** window, click the delete icon corresponding to the pipeline you want to delete.
2. A confirmation window is displayed. If you wish to delete the process, click **Accept**.

   If this pipeline is used as a Sub Pipeline in another Business Pipeline, an alert is displayed with the list of Business Pipelines where it is used.

> **Note**
>
> You cannot delete the pipeline, if it is already triggered.

1.6.4 Data Fields

Data Field, also known as a process variable, enables Process Pipelines access and store information from external sources. Often, the process flow is based on the value of this information. In other cases, this information is the result of running tasks in the pipeline.

1.6.4.1 Add a Data Field

1. On the **Process Modeler** page, click the pipeline to which you want to add a Data Field.

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2. Select **DataFields** from the header to display the **Data Fields** window.
3. Click the + icon to display the **Addition of Data Field** window.
4. Provide the details described in the following table and click the check mark icon to save the details:

Table 1-22 Data Field Details Description

Field Name	Description
Data Field Code	Enter the Variable Name/Code, which will be used to read or write into this variable. This field is non-translatable.
Data Field Description	Enter a brief description.
Data Field Type	Select the Data Field Type.
Initial Value	Enter the initial value for the data.
Is Mandatory	Applies to the **AOM** Data Field Type. **Yes** is the default selection for AOM. Select **No** if you do not want this parameter to be displayed as Execution Parameter for the Run pipeline.
Scope	Select the scope of the Data Field. Options are: • **Process** - To use the Data Field only in the current process. • **Package** - To use the Data Field across all the processes in the package.

1.6.4.2 System Data Fields

Some data is tracked internally by Financial Services Data Foundation Cloud Service For Banking using a predefined set of Data Fields such as Status. You can access these activity instance attributes in the same way you access Regular Data Objects, but you cannot assign them new values.

1.6.5 Executing Run Pipeline

After creating your Run pipeline, your next step is to execute it. To execute a Run pipeline, complete the following steps:

1. From the **Process Modeller Summary** page, click the menu button corresponding to Run pipeline you want to execute and select **Execute Run**.
2. The **Execution** window is displayed.
3. Select the **Execution Type**, **Object ID**, and **Application Params (in JSON format)** and click **Execute**.

The execution is triggered using the selected FIC MIS DATE. The RUNSKEY is generated and inserted into the “DIM_RUN” table. For the RUNSKEY generated, the corresponding user-selected parameters are inserted into the “RUN_EXE_PARAMETERS” table.

You can use the Process Flow Monitor to view the status of the execution as the Run pipeline is executed.

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1.6.6 PMF Dashboard

When multiple pipelines are running in parallel, it becomes important to monitor their execution status. This includes tracking whether tasks within the pipelines have completed, failed, been canceled, or are still in progress.

The **Process Modeling Framework (PMF) Dashboard** provides detailed execution information for all PMF processes associated with **Loader** components and **Data Quality** executions within an environment (tenancy). Access to the PMF Dashboard is restricted to authorized users who belong to the **Data Foundation Admin Group** or the **Data Foundation Operations User Group**.
Authorized users can drill down into each PMF process to view related activities and examine recorded events for each activity. This includes information such as timestamps, event messages, and error codes, helping users monitor the progress of each task. Additionally, users can monitor a pipeline and view it directly on the PMF canvas.

To access the PMF Dashboard, click the **PMF Dashboard** icon on the **Process Modeler** page. Once on the dashboard, you can explore detailed information about the executed processes and events (activities) that occurred during task execution.

You can filter activities and tasks by parameters such as **completion status**, **Process ID**, or **execution date**. The results can also be exported as a report in **Excel** or **CSV** format.

1.6.6.1 View and Filter PMF Dashboard

The **PMF Dashboard** provides detailed, drill-down information about the processes that have run, along with the events (activities) that occurred during task execution. You can use the available filters to quickly search for and locate a PMF process, whether it completed successfully or failed.

> **Note**
>
> The PMF Dashboard supports wildcard search where you can search for objects without having to provide the complete activity name, process name, or instance ID. In addition, the search feature is case-agnostic; you can type the search strings in upper or lower case.

To view and filter the PMF Dashboard:

1. From the **Data Foundation Cloud Service** home page, select **Process Orchestration**.

   The **Process Modeler** page is displayed.
2. Click the **PMF Dashboard** icon on the header. The **PMF Dashboard** page appears and displays the PMF processes that have run.
3. You can filter the PMF dashboard to quickly search for a PMF process you are interested in. Note that the search is case-sensitive. The following filter options are available:
   - **Process Status**: Select one or multiple statuses to filter the PMF dashboard. For example: to see all processes that have failed, click **Process Status** under the search bar and select **Failed** to view a list of all the processes that have failed.
   - **Process Name**: Enter the process name.
   - **Process ID**: Enter the process ID.

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- **Process Instance ID**: Enter the process Instance ID.
- **More Filters**: Select from one of the multiple options available.
- **Execution Date**: Select a time period or a date range based on the time zone in which the user is logged in.

The dashboard is refreshed and the PMF process(es) matching your filter criteria are displayed.

4. You can drill-down each PMF process to view the activities (tasks) that have been defined for that process. Use the additional filters to filter activities based on **Activity**, **Event Parameters**, **Event Message**, and **Event Error Code**. To apply a filter, click inside the search bar, select the filter, and press Enter.
5. Each PMF process has the following information:
   - **Process Instance ID**: The unique system-generated value that identifies the process instance.
   - **Data Source ID**: The Data Source ID of the process.
   - **Run Params**: The input parameters provided to execute this process.
   - **As Of Date**: The As of date.
   - **Run Skey**: The unique number created for each instance.
   - **Start Time**: Start time of the process execution.
   - **End Time**: End time of the process execution.
   - **Duration**: Duration of the process execution.
   - **Status**: Indicates if the process has completed, failed, was canceled, or is still running.
   - **Monitor**: Click this icon to view the progress of this process on the PMF canvas.
6. Click the PMF process link to drill down and display the activities associated with this process. The associated activities (for example: SCD, Connectors, Run DQ Rule, and so on) are displayed. For each activity, the following information is available:
   - **Component**: The component type.
   - **Start Time**: Start time of the activity execution.
   - **End Time**: End time of the activity execution.
   - **Duration**: Duration of the activity execution.
   - **Status**: Indicates if the activity has completed, failed, was canceled, or is still running.
7. Click the activity name link to drill down further and view details of the events within this activity. For example: if the activity is an **Insert Connector**, the following event information is displayed:
   - **Timestamp**: The latest record is displayed on top.
   - **Number of error records**: The number of error records.
   - **Event**: The event that is being recorded.
   - **Number of records loaded**: The number of records that were loaded.
   - **Event message**: Status of the event completion.

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1.6.6.2 Exporting PMF Dashboard Report

You can also export the PMF dashboard contents as a report in Excel or CSV formats. Here again you have options to filter the data that is exported.

To export contents of the PMF Dashboard into a report:

1. On the **PMF Dashboard** page, use the filters to select the PMF process(es) and the activities within the PMF process(es) you are interested in.
2. Click **Export**.
3. Choose the format for your report (Excel or CSV).
4. You need to apply at least one filter criteria to export the report as there is a limit to the number of records you can export. To filter the contents to export to your report, click the **With Filter** option and select the filter criteria from the search box.
5. Click **Export** and save the report file to a local directory. The report will contain details of the selected process(es), activities within the process, and the tasks within the events.

> **Note**
>
> The export file can contain a maximum of 6500 records (rows) only. Hence it is recommended to use at least one filter when exporting the contents of the Dashboard to a report.

1.6.6.3 PMF- Error Codes and Descriptions

The PMF Error codes are categorized as follows:

- WARNING - Anything that can potentially cause application oddities, but for which the application can automatically recover.
- ERROR - Any error which is fatal to the operation, but not the service or application (can't open a required file, missing data, etc.). For example, an error can be used in a scenario where a PMF activity perform 10 sub operations, out of which one failed and other 9 and over all activity is succeeded.
- FATAL - Any error that is forcing a failure of a PMF activity can be FATAL.
- FATAL-AUTOMATED - If the component is not sending any FATAL to PMF, the PMF will auto-generate a fatal message "Automated: <Activity ID> is Failed".

COMP	CATEGORY	EVENT CODE	EVENT DESC
DQ	FATAL	DQ_ERR_001	Threshold is breached
DQ	FATAL	DQ_ERR_002	DQ Execution Failed
DQ	FATAL	DQ_ERR_003	Invalid Input Message
DQ	FATAL	DQ_ERR_004	DQ Group is unauthorized
DQ	FATAL	DQ_ERR_005	Rules/Groups could not be registered with Concurrency
DQ	FATAL	DQ_ERR_006	Unknown Error Encountered
DT	FATAL	DT_ERR_002	DT Execution failed with Validation error

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COMP	CATEGORY	EVENT CODE	EVENT DESC
DT	FATAL	DT_ERR_001	DT Execution failed
DT	FATAL	DT_ERR_003	Exception occured while Executing DT
HCY	FATAL	HCY_ERR_001	Hierarchy Refresh Execution failed
HCY	FATAL	HCY_ERR_002	Hierarchy Resave Execution failed
SCD	FATAL	SCD_ERR_002	SCD Execution failed with Validation error
SCD	FATAL	SCD_ERR_003	Exception occured while Executing SCD
SCD	FATAL	SCD_ERR_001	SCD Execution failed

1.6.7 PMF Email Notification

Use this feature to configure the email notifications for package/process or user level.

The PMF Email Notification page enables you to send Email notifications for indicating the status (completion or failure) of a PMF process. This will permit pushed notification of users via email with failure/completion status for taking timely and necessary actions.

1.6.7.1 PMF Email Notification at Package or Process Level

Use this feature to set Email notification at package/process level.

To set the PMF Email notification at Package/Process level:

1. From the **Financial Services Data Foundation Cloud Service for Banking** Home page, select **Data Pipelines**.

   The **Process Modeler** page is displayed.
2. Click the **PMF Email** icon on the header. The **PMF Email Notification** page appears and displays the Package and Process Level email notifications.

   You must be mapped to FINANCIAL SERVICES DATA FOUNDATION CLOUD SERVICE FOR BANKING ADMNGRP user group to view the PMF Email icon on the header.
3. Click the plus icon and select the Package radio button and the package IDs for which the email notifications has to be triggered.
4. Click **Apply**.

   The selected packages are displayed.
5. Click **Add User** and select the **User** or **User Group** to whom the email notifications to be shared.

   You should add users at package level and not at the process level.
6. Click **Apply** and **Save**.

1.6.7.2 PMF Email Notification at User Level

Use this feature to set Email notification at user level.

To set the PMF Email notification at User level:

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1. From the **DFCS Home** page, select **Data Pipelines**.

   The **Process Modeler** page is displayed.
2. Click the **PMF Email** icon on the header. The **PMF Email Notification** page appears and displays the Package and Process Level email notifications.
3. Click the plus icon and select the User/User Group radio button and the users or groups to receive the email notifications.

   You should add users at package level and not at the process level.
4. Click **Apply**.

   The selected User/User Groups are displayed.
5. Click **Add Package** and select the Package or Process for which the email notifications has to be triggered
6. Click **Apply** and **Save**.

1.6.7.3 PMF Email Notification Template

Use this page to configure the email notification messages for package/process or user level.

To configure the PMF Email notification messages:

1. From the **DFCS Home** page, select **Data Pipelines**.

   The **Process Modeler** page is displayed.
2. Click the **PMF Email** icon on the header. The **PMF Email Notification** page appears and displays the Package and Process Level email notifications.

   You must be mapped to DFCSADMNGRP user group to view the PMF Email icon on the header.
3. Click **Template** option next to Email Notification at the bottom of the page.

   The Email Notification template is displayed. By default, the following variables are added to the message body:

   - Tenant-Id
   - Run-Sk
   - Process-Id
   - Object-Id
   - Task-Status
   - As-Of-Date
   - Entity-Name
   - Process-End-Time
   - Entity-Id
   - Title
   - locale
   - Process-Start-Time
   - Entity-Type
   - Process-Name
   - Process-Instance-Id

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- Received-On

4. You can remove the variables from the Template body to be displayed in the email based on your requirements.

   The Template you configure is at global level and not at the user group or package/process level.

> **Note**
>
> Forwarding the email will send all the parameters available and do not retain the template.

1.6.8 Process Monitor

Use the Process Monitor to monitor the current stage of a process. After integrating with a service, a workflow is invoked. After it is invoked, the workflow goes through all the defined stages. Using the Process Monitor, you can view all the stages of the workflow such as current stages, stages to follow, if any, and finished.

Your user group must be mapped to the function role WFMACC (Workflow Monitor Access) to access the Process Monitor window.

1. On the **Process Modeler** page, click the **Process Monitor** icon on the header to view the Process Monitor page. All workflows that are invoked from the service are displayed along with details such as **Entity Name**, **Entity ID**, **Process Name**, **Process Description**, **MIS Date**, **Execution Start Time**, **Last Execution Time**, **Last Updated By**, and **Status**.

To monitor only a selected pipeline, on the Process Modeler summary page, click the menu button corresponding to that pipeline and select **Process Flow Monitor**. The execution details are displayed.

Click the menu button corresponding to the selected pipeline to view options to:

- **Resume**: To resume a Run pipeline.
- **Re-run**: To execute a Run pipeline again irrespective of the previous execution status.
- **Abort**: To abort an ongoing Run pipeline

> **Note**
>
> In case of Disaster recovery (DR) after switch over to the secondary site, the processes that are in running status should be aborted and resume to proceed further.

To return to the Process Modeler page, click the Process Modeler icon on the header of the Process Monitor page.

Use the **Search** field to search for a specific pipeline by providing a keyword from either the Process ID, Process Name, or Process Description of the process you are looking for and click **Search**.

1.6.8.1 Process Monitor

From the **Process Monitor** window, click the Entity ID link corresponding to the process you want to monitor.

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The status of the activity is represented as: **Completed**, **Failed**, **Cancelled** or **Running**.

You can also set auto-refresh in the header. Select **Enabled** in **Auto Refresh**, enter a value from 1 to 10 in **Refresh Interval (In Min)** and then click **Apply**.

1.6.8.2 Viewing Activity Execution Logs

Use this feature to view logs of the execution of each activity from the Process Monitor window.

To view Activity Execution Logs:

1. From the Process Monitor page, click the process which you want to monitor. The canvas displaying the workflow along with the status is displayed. On the canvas, double-click an activity to view the **Activity Execution** window. The activity details are displayed.
2. Click the **Execution Logs** button to view the Activity Execution Log.

   The Log Viewer window shows all the execution stages (successful and failed) of the selected activity if it is already executed.

   The **Batch Run ID** and **Process ID** fields show the information for the previously selected parameters in the activity configuration.

   > **Note**
   >
   > Use the **Search** field to search within the execution log.

   The information available is segregated in to sequence, timestamp, severity, and message.

   You can sort by Ascending or Descending Order by clicking the Up and Down Arrows in the Header Row.

   - Sequence depicts the order of the log messages generated during execution.
   - Timestamp shows the date and time of the generation of the log message.
   - Severity shows labels such as Info to show the type of message, which helps determine if any intervention is required.
   - Message displays the log message generated.

   > **Note**
   >
   > The information in the Log Viewer window is specific to the selected Process Orchestration activity such as a widget or transition.

1.6.9 Abort Run Pipeline

You can abort a Run Pipeline that is in the process of execution.

To abort a Run pipeline, complete the following steps:

- From the **Process Monitor** window, click the menu icon corresponding to the Run pipeline that is being executed that you want to abort and click **Abort**.

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1.6.10 Resume Run Pipeline

You can resume a Run Pipeline which has not been executed successfully or which has been explicitly interrupted, or canceled, or put on hold during the Execution process. By resuming a Run pipeline, you can continue its execution directly from the point of interruption or failure and complete executing the remaining tasks.

To resume a Run Pipeline

- From the **Process Monitor** page, click the menu icon corresponding to the Run pipeline you want to resume and click **Resume**.

1.6.11 Re-run Run Pipeline

You can re-run a Run pipeline that was previously executed, irrespective of the previous execution state.

To re-run a Run pipeline, complete the following step:

- From the **Process Monitor** page, click the menu icon corresponding to the Run pipeline you want to re-run and click **Re-Run**.

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