Oracle® Manufacturing Operations Center

Implementation Guide

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Oracle Manufacturing Operations Center Implementation Guide, Release 12 (12.1)

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Preface

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Welcome to Release 12 (12.1) of the *Oracle Manufacturing Operations Center Implementation Guide.*

See Related Information Sources on page x for more Oracle Applications product information.

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Related Information Sources

Do Not Use Database Tools to Modify Oracle Applications Data

Oracle STRONGLY RECOMMENDS that you never use SQL*Plus, Oracle Data Browser, database triggers, or any other tool to modify Oracle Applications data unless otherwise instructed.

Oracle provides powerful tools you can use to create, store, change, retrieve, and maintain information in an Oracle database. But if you use Oracle tools such as SQL*Plus to modify Oracle Applications data, you risk destroying the integrity of your data and you lose the ability to audit changes to your data.

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Applications data using anything other than Oracle Applications, you may change a row in one table without making corresponding changes in related tables. If your tables get out of synchronization with each other, you risk retrieving erroneous information and you risk unpredictable results throughout Oracle Applications.

When you use Oracle Applications to modify your data, Oracle Applications automatically checks that your changes are valid. Oracle Applications also keeps track of who changes information. If you enter information into database tables using database tools, you may store invalid information. You also lose the ability to track who has changed your information because SQL*Plus and other database tools do not keep a record of changes.

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Manufacturing Operations Center Introduction

This chapter covers the following topics:

- Manufacturing Operations Center Overview
- Technology Overview
- Architecture Overview
- Manufacturing Operations Center Instances
- Source Data Time Zone
- Unit of Measure Conversion
- Currency Conversion

Manufacturing Operations Center Overview

Manufacturing Operations Center enables you to monitor and improve plant performance by analyzing real-time plant floor data. You can use Manufacturing Operations Center to integrate different types of data sources. It uses manufacturing operations data to generate real-time dashboards and reports, and it allows you to:

- Monitor production performance in real time.
- Build a foundation for continuous improvement programs.
- Facilitate data flow between ERP applications and plant floor systems.
- Enable virtual manufacturing.

Technology Overview

Manufacturing Operations Center uses the following Oracle Fusion 10g technologies:

- Oracle Data Warehouse Builder (OWB)

- Oracle Business Intelligence Enterprise Edition (OBIEE)

- Oracle Business Activity Monitoring (BAM)

- Oracle Service-Oriented Architecture Suite

    - Enterprise Service Bus (ESB)

    - Business Process Execution Language (BPEL)

- Oracle EBS Foundation

Architecture Overview

The following diagram provides an overview of Manufacturing Operations Center's architecture:
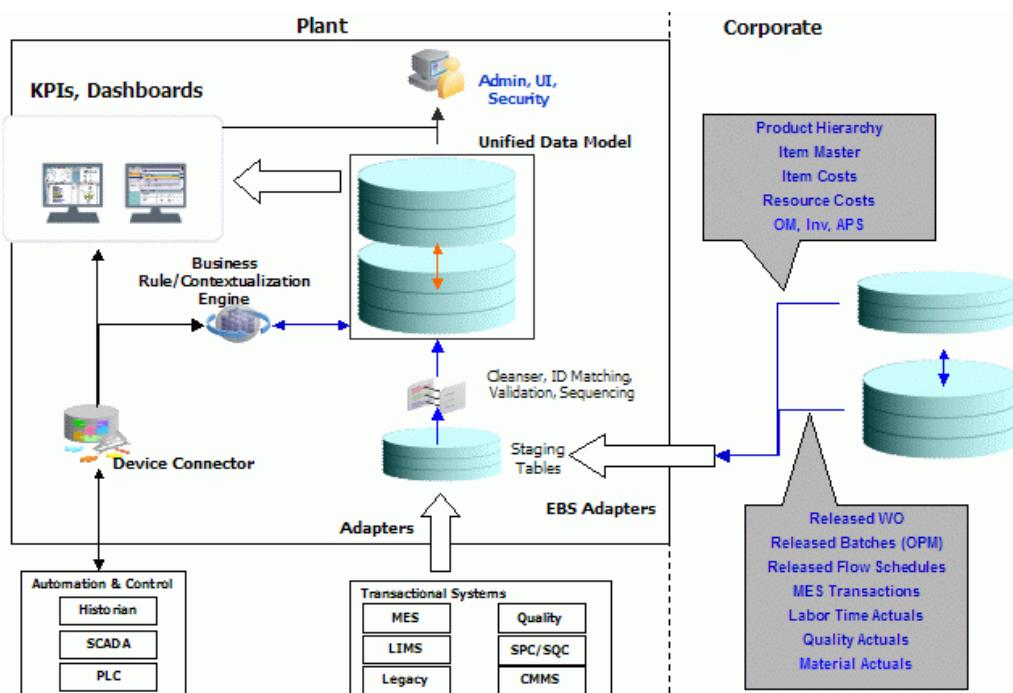
Data Model

Manufacturing Operations Center data models complies with S-95 standards and is optimized for intelligence and integration. Data models are open and scalable for user-defined such items as attributes and hierarchies. etc. Oracle Fusion Middleware is scalable and SOA enabled.

Extensibility

- Pluggable business rules (OWB mappings)

- Ad-hoc dashboards and reports with OBIEE

- Business Process Orchestration with the Oracle SOA suite

Connectivity

Manufacturing Operations Center supports heterogeneous systems including device data.

Prepackaging

Manufacturing Operations Center is prepackaged with an EBS adapter for Release11i10. Dashboards and reports are based on business logic models.

Manufacturing Operations Center Instances

Typically, Manufacturing Operations Center is installed locally at a plant location. There can be single plant installations or multiple plants installations. It can be installed on a server for a single plant or for multiple plants that are connected together. One company may have several different instances of Manufacturing Operations Center installed.

Consider the following example of a global manufacturing company with plants at two locations, in the U.S. and in India, and the U.S. has two different plant locations:
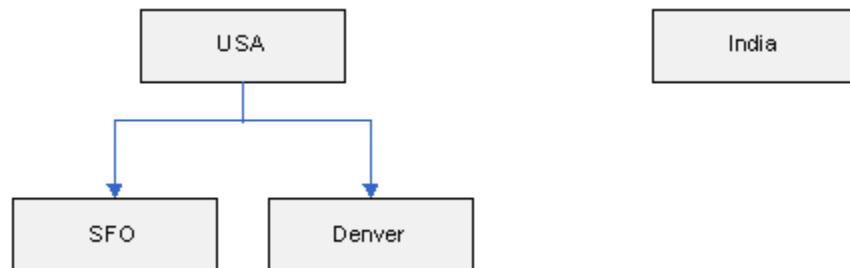
In this example, a user has the following options for installing Manufacturing Operations Center instances:

Option 1

- MOC Instance 01 - USA - SFO

- MOC Instance 02 - USA - Denver

- MOC Instance 03 - India

With this option, plants are not grouped together and an instance of Manufacturing Operations Center is installed at each plant and organized on the plant level.

Option 2

- MOC Instance 01 - USA

- MOC Instance 02 - India

With this option, plants are grouped by country. The individual plants SFO and Denver have been grouped together into a single instance called USA.

Option 3

- MOC Instance 01 - USA & India

This option is a corporate installation for which all three of the individual plants are grouped into one instance called USA & India.

Source Data Time Zone

There is no out of the box data conversion for time zones. Use Oracle Warehouse Builder (OWB) utilities to convert data from the source time zone to the Manufacturing Operations Center time zone.

Unit of Measure Conversion

There is no out of the box data conversion for unit of measure. Use OWB utilities to convert data for an item in one unit of measure for data in Manufacturing Operations Center.

Currency Conversion

There is no out of the box data conversion for currency. Use OWB utilities to convert currencies.

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Responsibilities and Menus

Responsibilities and Menus Overview

The Menu structure for Manufacturing Operations Center Administrator responsibility is as follows:

Menu	Submenu
Setup	• Tag Setup
	• Contextualization Setup
Extensible Attributes Workbench	• Items
	• Equipment
	• Work Orders
	• Others

The Menu structure for Manufacturing Operations Center User responsibility is as follows:

Menu	Submenu

Tag Data Workbench	• Manual Contextualization
	• Equipment Downtime Reasons
	• Equipment Scrap Reasons
Extensible Attributes Data	• Items
	• Equipment
	• Work Orders
	• Others
Manufacturing Operations Center Analytics	• Manufacturing Operations Center Catalog
	• Plant Manager Dashboard

The Menu structure for Manufacturing Operations Center User responsibility is as follows:

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Setup Overview

Manufacturing Operations Center Setup Overview

Complete the following setup tasks for each instance of Manufacturing Operations Center:

- OWB setup

- Source system setup

- Plant setup

- Time dimension setup

- Item dimension setup

- Equipment dimension setup

- Tag and data contextualization setup

- Extensible attribute setup

> **Important:** This document outlines the process of loading data into Manufacturing Operations Center from Oracle E-Business Suite (EBS) or Microsoft Excel templates. Loading data from any other source requires customization. Custom mappings are created in OWB and loaded into MOC staging tables as displayed in the diagram below:

4
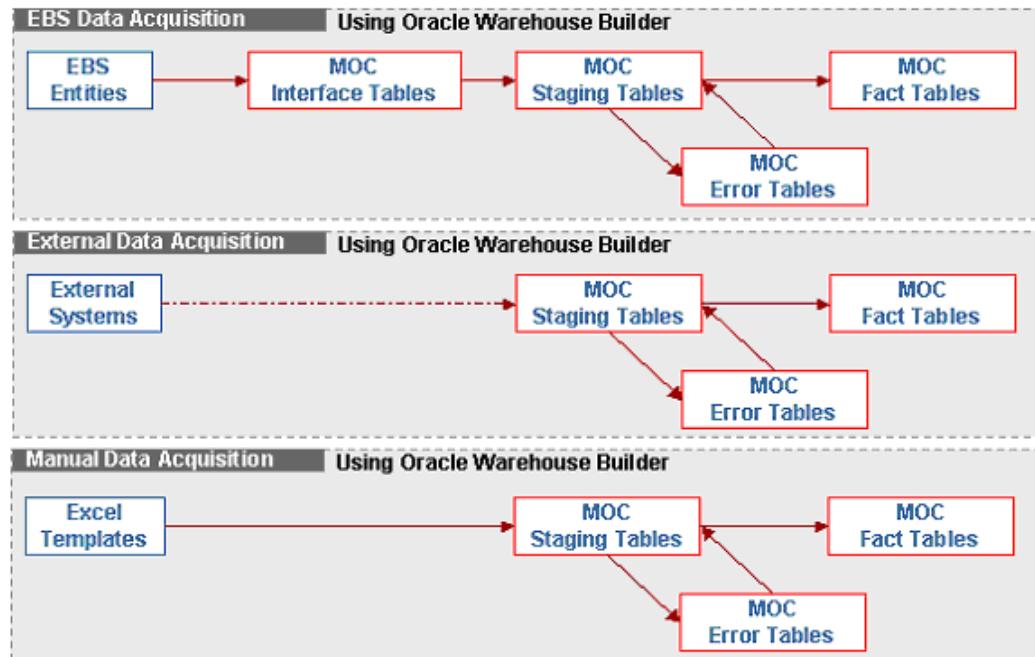
Oracle Warehouse Builder Setup

This chapter covers the following topics:

- Oracle Warehouse Builder Setup Steps

- Customizing the OWB Repository for Two EBS Systems

- Customizing the OWB Repository for One EBS System and One Non-EBS System

Oracle Warehouse Builder Setup Steps

For more details on installation steps, refer to the *Oracle Supply Chain Planning Feature Pack (R12.SCP_PF.B) Installation Readme* file.

Complete the following Oracle Warehouse Builder setup steps:

1. Set up the OWB repository.

2. Register users.

3. Import the Metadata Loaders (MDLs) in the order specified in the Readme file.

4. Create locations.

    - Source system locations:

        - The location of the EBS 11.5.10 system. The Service Name defined for EBS source systems should be same as the profile name in the source system MTH: System Global Name.

        - The location of other systems based on the database on which they are installed.

        - The location of .csv templates.

    - The target system location where the Manufacturing Operations Center data is

stored.

- The location of the workflow.

5. Configure the repository locations.

6. Set up the Control Center.

7. Deploy Dimensions, External Tables, Mappings and Process flows in the order specified in the Readme file.

There is always one target system, but there can be many source systems including the location of the .csv templates. Manufacturing Operations Center is designed to work out of the box with one EBS 11.5.10 source system and one file location. However, Manufacturing Operations Center can be customized to integrate with multiple source.

Troubleshooting Tips

To specify parameters when running a load:

1. In the OWB Design Center, browse to Tools, Preferences, MTHUSER - Deployment Process.

2. Select the following options:

- Prompt for Execution Parameters

- Show Monitor

When you change an organization's calendar, data for old shifts is not deleted. To work around this, set the plant code to equal the EBS source's organization code.

Customizing the OWB Repository for Two EBS Systems

The first source system scenario is two EBS data sources for one installation of Manufacturing Operations Center. Complete these steps to set up OWB for Manufacturing Operations Center with this source system combination:

1. In the Project Explorer area, browse to MTH, Databases, Oracle.

- EBS tables that are used as a data source are listed in MTH_SOURCE, Tables.

- Manufacturing Operations Center tables used to load the data are listed in MTH_TARGET, Tables.

- Pre-seeded mappings to an Oracle EBS instance are listed in MTH_TARGET, Mappings.

2. In the Connection Explorer area, browse to Locations, Databases, Oracle.

3. Create a new location for the second EBS source by right-clicking on Oracle and selecting New.

4. In the Project Explorer area, right-click on MTH_SOURCE and select Copy.

5. Right-click on Oracle and select Paste.

6. If required, rename the copied source.

   When you copy a source, source tables are also copied.

7. Map the source of the new module to the new location you created in the Connection Explorer.

8. Browse to MTH, Databases, Oracle, MTH_Target, Mappings.

9. Edit the existing mappings or add a new map by copying and pasting.

10. Open the Mapping Editor.

11. Right-click and select Synchronize to swap the existing source in the mappings to the new source.

12. Create new joins and filters.

13. Deploy the Mappings

Customizing the OWB Repository for One EBS System and One Non-EBS System

The second source system scenario is one external EBS data source and one non-EBS external data source. Complete these steps to set up OWB for Manufacturing Operations Center with this source system combination:

1. In the Project Explorer area, browse to MTH, Databases, Oracle.

   • EBS tables that are used as a data source in Manufacturing Operations Center are listed in MTH_SOURCE, Tables.

   • MOC tables used to load the data are listed in MTH_TARGET, Tables.

   • Pre-seeded mappings to an Oracle EBS instance are listed in MTH_TARGET, Mappings.

2. In the Connection Explorer area, browse to Locations, Databases, Oracle.

3. Create a non-EBS source location by providing the database link details for the non-EBS source.

4. In the Project Explorer area, create a new Data Source module in Oracle.

5. In Step 2 of the Create Module window, point the module to the Location that you created.

6. In the new Data Source module, right-click Tables and select Import.

7. The Import Metadata Wizard launches.

8. Use the Import Metadata Wizard to select the tables to import from the source.

   > **Note:** Although tables are selected, only their metadata is imported, not the actual tables.

9. In the MTH_Target module, edit existing mappings or create new mappings.

10. Open the Mapping Editor.

11. Right-click and select Synchronize to change the source of an existing table or view.

12. Close the Mapping Editor.

13. Deploy the edited or created mappings.

Refer to the *Oracle Warehouse Builder User Guide* for more information.

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Setting Up Source Systems

This chapter covers the following topics:

- Source System Setup Steps
- Source System Setup: Microsoft Excel Template
- Source Systems Setup Maintenance

Source System Setup Steps

Complete these steps to set up source systems:

1. In the source EBS system, set up the profile option MTH: System Global Name.

   - This name is used as a service name when the OWB location is specified for the EBS system.

   - The name defined should be configured as a service name in EBS.

2. In the Microsoft Excel template, update MTH_SYSTEMS_SETUP.csv with definitions for the source system.

   Configure OWB mappings to populate the system identifier to be the same as the ones set up in the source system. Data collected from EBS is automatically stamped with the source system's identifier.

3. In OWB Mappings's MTH Utilities, run the MTH_SYSTEMS_SETUP_XS_ALL_MAP mapping to load data into Manufacturing Operations Center.

Source System Setup: Microsoft Excel Template

This table displays the structure of the Microsoft Excel template that is used to define the source system:

System Code	System Type	System Name	USER_ATTR1	USER_ATTR2	USER_ATTR3	USER_ATTR4	USER_ATTR5
TESTSYST01	EXCEL	TESTSYST01	A	B	C	D	E

System Type can be any value, but it is recommended that you use one of the following choices which are available in a lookup table:

- Enterprise Resource Planning

- Manufacturing Execution System

- Advance Planning

- Device Data Source

- Historian

- Supervisory Control And Data Acquisition

- Quality Management System

- Statistical Process Control

- Maintenance Management System

- Legacy System

- Spreadsheet

- Other Sources

> **Note:** Errors will occur if System Code and System Name are not unique.

Source Systems Setup Maintenance

Data is collected from various systems. You must ensure that the system name that is populated through OWB matches one of the names previously set up in Manufacturing Operations Center. If this is not the case, rows will be moved to the error table.

Unassigned Logic

Data rows are marked with Unassigned System if you collect data from a source for which the system name is not populated.

Update Logic

- System name, system type, and user attributes can be updated for the system code.

- System name should not be deleted.

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Setting Up Plants

This chapter covers the following topics:

- Overview of Plants
- Plant Set Up Steps
- Plant Setup: Microsoft Excel Templates
- Plant Maintenance
- Graveyard Shift Option
- Running Seed Data Process Flows

Overview of Plants

The plant definition is set up on Manufacturing Operations Center and mapped to source organizations in different systems. This diagram illustrates the plant setup flow:
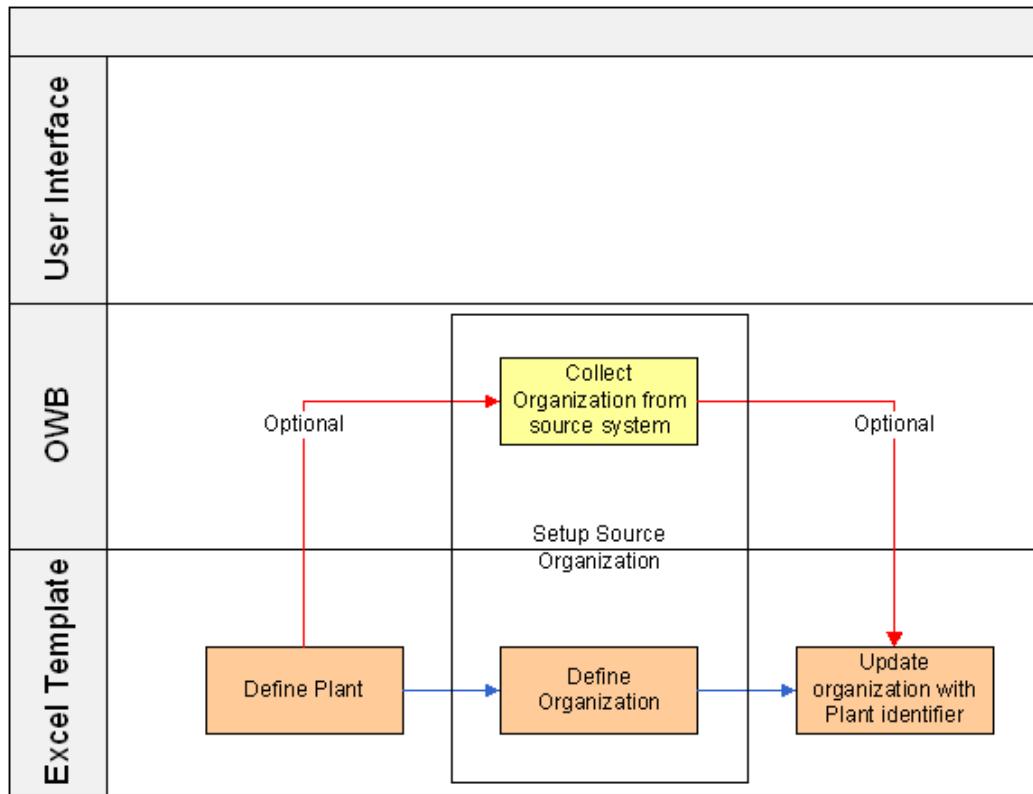
Plant Set Up Steps

To set up a plant:

1. Define MOC plants in the Microsoft Excel template by updating the definitions in MTH_PLANTS_MASTER.csv.

2. Load the source organization from EBS.

   - For initial data collections (a full refresh), run the MTH_PLANTS_DIM_EBS_INIT_PF process flow in the MTHEBIIP module.

   - For incremental collections, run the MTH_PLANTS_DIM_EBS_INCR_PF process flow in the MTHEBICP module.

3. Define non-EBS source organizations in the Microsoft Excel template by updating the definitions in MTH_ORG.csv.

4. Load non-EBS source organizations by running MTH_ORG_XS_ALL_MAP in the OWB Mapping MTH Utilities project.

5. Update the organization with the plant identifier in the Microsoft Excel templates.

Update MTH_ORG.csv with the following:

- Implement in Plant Flag

- Plant Identifier

- System Identifier

The organization is linked to the plant.

6. Create an organization with the following:

- The organization code same as plant code.

- The system as Unassigned for loading data from Microsoft Excel.

To perform this task, run MTH_PLANTS_ORG_ALL_MAP in MTH Utilities.

Plant Setup: Microsoft Excel Templates

This table displays the structure of the Microsoft Excel template used for the plant setup:

Plant Code	Plant Name	Source	Currency Code	From Date	To Date	Graveyard Shift Flag
RO5	PLANTFO RRO5	1	USD	1/14/2008		1
RO3	PLANTFO RRO3	1	USD	01/01/2007	01/05/2008	1

To define a plant, specify the following information:

- Plant code. (This value is unique to the plant.)

- Plant Name.

- Source. (One source is required if it is discrete, and two are required if it is process.)

- Currency Code

- From Date. (The date from which the plant is operational.)

- To date. (The date to which the plant will be operational.)

- Graveyard Shift flag. (Possible values for this flag are 1 if it is Shift End Workday and 2 if it is Shift Start Workday.)

Organization Setup: Microsoft Excel Template

This table displays the structure of the Microsoft Excel template used for the organization setup:

Organization Name	Process Enabled Flag	Currency Code	EBS Organization ID	Primary Cost Method	Organization Code	Implement in Plant Flag	Plant Code	System Code
MTHORG	N	Rs	5248	1	MTH	Y	MTHHUB1	SCMC2MQ0

Plant Maintenance

Unassigned Logic

No unassigned plant is provided. All data should be mapped to defined plants in Manufacturing Operations Center.

Update Logic

You can update this information:

- Plant name and attributes for each plant code.

- Plant can only be end-dated and cannot be deleted.

- After a plant is end-dated or made inactive, Manufacturing Operations Center stops collecting data.

- If a data collection end date is not specified, plant data is collected indefinitely.

- The selected source organization can be updated for a different plant.

- Source organizations can be deleted.

Graveyard Shift Option

You must set the Graveyard Shift option for shifts that span different dates. You can set

this option to:

- 0: the Shift Start Workday

- 1: the Shift End Workday

For example, Shift C spans 8 PM 08/06/2008 to 6 AM 08/07/2008. You can stamp Shift C as 08/06/2008 or 08/07/2008. If you want to stamp Shift C on 08/06/2008, then you must select the Shift Start Workday option. If you want to stamp Shift C on 08/07/2008, then you must select the Shift End Workday option.

Running Seed Data Process Flows

To load seed data, run the process flow MTH_SEED_DATA_PF in the MTHEXIIP module.

When seed data is run:

- MTH_LOOKUPS_D populates the lookup tables used for such things as work order status with the seed data.

- MTH_DIM_HIERARCHY populates the hierarchy table with seed data for seeded hierarchies.

- MTH_DIM_LEVEL_LOOKUP populates the level lookup table with seed data for each hierarchy level.

- MTH_ENTITIES populates entities for Manufacturing Operations Center which are used in tag setup.

When seed data is run, the following tables are populated with a value of Unassigned:

- MTH_SYSTEMS_SETUP

- MTH_ITEMS_D

- MTH_EQUIPMENTS_D

- MTH_EQUIP_ENTITIES_MST

- MTH_PRODUCTION_SCHEDULES_F

- MTH_PRODUCTION_SEGMENTS_F

- MTH_RESOURCES_D

- MTH_ITEMS_CATEGORIES_D

7

Setting Up Time Dimension Hierarchies

This chapter covers the following topics:

- Time Dimension Hierarchies Overview
- Defining the Manufacturing Operations Center Calendar
- Populating the Workday Shift Calendar
- Changing the Shift Boundary
- Changing a Shift Name
- Adding a New Shift
- Catch All Shift
- Time Dimension Hierarchy Maintenance

Time Dimension Hierarchies Overview

Manufacturing Operations Center can analyze data by five different hierarchies for time dimension roll-up out of the box. Any number of hierarchies can be built and analyzed. The following diagram illustrates the process flow for the time dimension hierarchy setup:
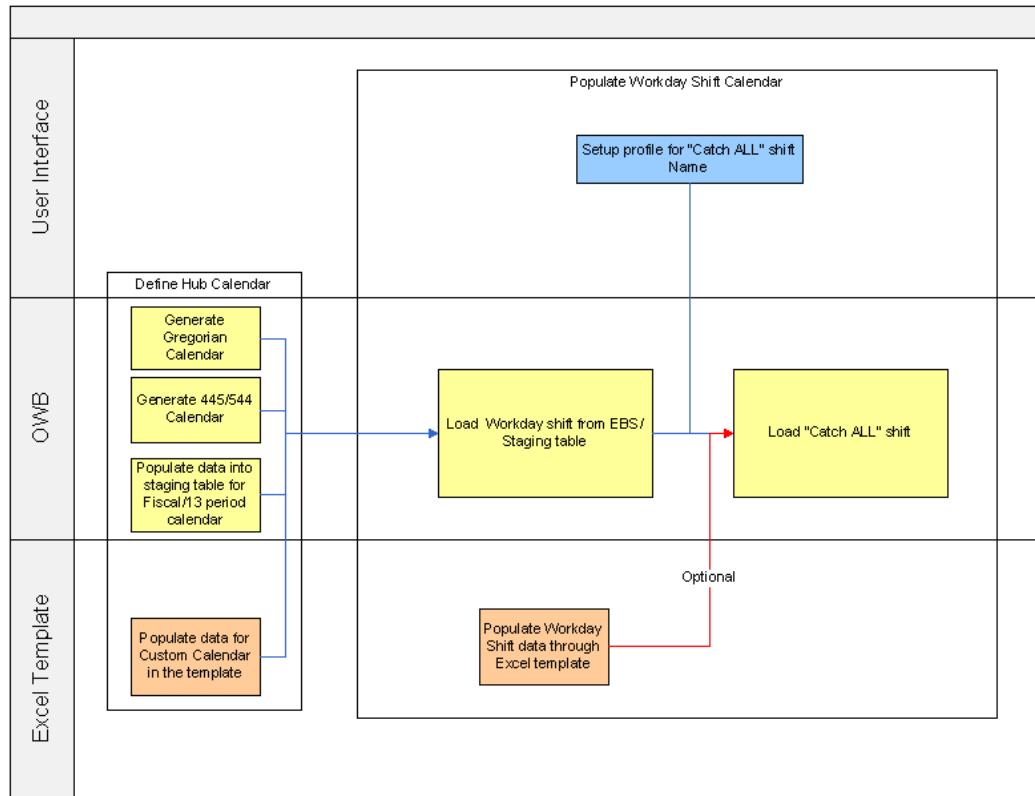
Complete the following tasks to set up the Manufacturing Operations Center time hierarchy:

1. Define the MOC Calendar roll-up from Day to Year, irrespective of plant.

2. Populate the Workday Shift Calendar with shift information for the plant and roll-up.

Defining the Manufacturing Operations Center Calendar

You can define any or all of the following calendars:

- Gregorian (OWB generated)

- 445/544 (OWB generated)

- Fiscal (custom generated)

- 13 Period (custom generated)

- Custom Calendar (custom levels)

Gregorian Calendar

To generate a Gregorian calendar:

1. Run MTH_GREGORIAN_CALENDAR_MAP in the MTH project of the OWB Mappings.

2. Specify the following parameters:

   - Number Years; the number of years in the calendar.

   - Year Start Date

445/544 Calendar

To generate a 445/544 calendar:

1. Run MTH_445_PERIOD_CALENDAR_MAP in the OWB Mappings.

2. Specify the following parameters:

   - Day of Fiscal Week. This value can be any number between 1 and 7.

   - Fiscal_Year_Start_Date

   - Fiscal_type. This value can be 445 or 544.

   - Number_Years; the number of years for the calendar.

Fiscal and 13 Period Calendars

There are no mappings available for Fiscal or 13 Period calendars. To create and customize calendars in these formats:

1. Populate the level tables with data for levels such as Day, Week, Period, Quarter, and Year.

2. Build and populate the hierarchy table in Manufacturing Operations Center.

Custom Calendar

To generate a custom calendar:

1. In the Microsoft Excel template, update the MTH_TIME_DIMENSION.csv with the custom calendar hierarchy.

2. Update the Hierarchy relationship for all Day, Week, Period, Quarter, and Year

relationships.

3. Load the calendar into MOC by running MTH_TIME_DIMENSION_XS_MAP in OWB Mappings in the MTH Utilities project.

Populating the Workday Shift Calendar

You can use either of the following methods to populate the Workday Shift calendar:

- From EBS (if the organization selected for the plant already has a Bill of Materials calendar attached)

- From Microsoft Excel

To populate the Workday Shift calendar from EBS:

1. Load the Workday Shift from EBS by running one of the following process flows:

   - MTH_WORKDAY_SHIFTS_EBS_INIT_PF in the MTH Utilities project under the MTHEBIIP module, for an initial data collection

   - MTH_WORKDAY_SHIFTS_EBS_INCR_PF in the MTH Utilities project under the MTHEBICP module, for an incremental data collection

     In the prompt for incremental data collection, enter the Run_Start_Date parameter. This is the date from which the workday shift changes are applied. The default value is Sys date.

2. Correct errors using SQL Developer or Oracle APEX. All errors in MTH_WORKDAY_SHIFTS_ERR must be fixed and the reprocess ready flag set to Y.

   Rows that are ready for reprocessing will be picked up in the next incremental run.

To populate the Workday Shift calendar from Microsoft Excel:

1. In the Microsoft Excel Template, update MTH_WORKDAY_SHIFTS.csv with the custom calendar hierarchy.

2. Load the Workday Shift calendar into the MOC staging table by running the MTH_WORKDAY_SHIFTS_XS_ALL_MAP OWB Mapping in the MTH Utilities project.

3. Load the Workday Shift calendar into the MOC fact table by running one of the following processes:

   - MTH_WORKDAY_SHIFTS_EXT_INIT_PF in the MTH Utilities project under the MTHEXIIP module, for an initial data collection

- MTH_WORKDAY_SHIFTS_EXT_INCR_PF in the MTH Utilities project under the MTHEXICP moduel, for an incremental data collection

4. In the prompt for incremental data collection, enter the Run_Start_Date parameter. This is the date from which the workday shift changes are applied. The default value is Sys date.

5. Correct errors using SQL Developer or Oracle APEX. All errors in MTH_WORKDAY_SHIFTS_ERR must be fixed and the reprocess ready flag set to Y.

   Rows that are ready for reprocessing will be picked up in the next incremental run.

Workday Shift: Microsoft Excel Template

This table displays the structure of the Microsoft Excel template used for the workday shift setup:

Shift Workday PK	Shift Date	Source_org_code	System Code	From Date	To Date	Shift Num	Shift Name
1-1/1/2007-p1	01/01/2007	p1	s1	1/1/07 0:00	1/1/07 9:00	1	morning shift

Changing the Shift Boundary

The following example shows a changed shift boundary:

Shift	Shift Name	From Time	To Time
Initial Shift Definition	Shift A	8:00 AM	1:00 PM
Initial Shift Definition	Shift A	2:00 PM	5:00 PM
Redefined Shift Definition	Shift A	9:00 AM	5:00 PM

When the EBS Bill of Materials Workday Calendar to Interface mapping is run after a shift is redefined, you can specify a Change Effective Date parameter.

- If the selected Change Effective Date is in the past, the shift definitions for the past

data are changed.

- If the Change Effective Date is in the future, dates specified in the initial shift definition apply.

Data Classification

These items apply to data classification:

- Data on or after the change effective date will be bucketed based on the Redefined Shift definition.

- Data before the change effective date will be bucketed on the Initial Shift definition

- The value Shift in the OBIEE list of values

- Only one set of Shift A appears with back-end definition for the span calculated based on the Change Effective Date.

Changing a Shift Name

The following example shows a changed shift name:

Shift	Shift Name	From Time	To Time
Initial Shift Definition	Shift A	8:00 AM	1:00 PM
Initial Shift	Shift A	2:00 PM	5:00 PM
Redefined Shift Definition	Morning Shift	8:00 AM	1:00 PM
Redefined Shift	Morning Shift	2:00 PM	5:00 PM

When the EBS Bill of Materials Workday Calendar to Interface mapping is run after the shift is redefined, you can specify a parameter to change the effective date. Based on the date provided, the changed definition will be applied from that date to the future.

OBIEE List of Values - Shift

Both the old and new definition appears in the list of values for the plant once the mappings EBS Bill of Materials Workday Calendar to Interface is run, irrespective of the Change Effective Date.

Adding a New Shift

The following example shows the addition of a new shift:

Shift	Shift Name	From Time	To Time
Initial Shift Definition	Shift A	7:00 AM	3:00 PM
Initial Shift	Shift B	3:00 PM	11:00 PM
Redefined Shift Definition	Shift A	7:00 AM	3:00 PM
Redefined Shift	Shift B	3:00 PM	11:00 PM
Redefined Shift	Shift C	11:00 PM	7:00 AM

When the EBS Bill of Materials Workday Calendar to Interface mapping is run after a shift is redefined, you can specify a parameter for change effective date. The changed definition is applied from that date to the future, based on the date provided.

OBIEE List of Values - Shift

The newly added shift will appear in the list of values for the plant once the mapping EBS Bill of Materials Workday Calendar to Interface is run, irrespective of the Change Effective Date.

Catch All Shift

In the workday calendar, a Catch All Shift can be used for a shift that spans a length of time that is not covered by the shift in a workday. In the following example, the Catch All Shift spans from 12:00 AM to 7:00 AM and from 11:00 PM to 12:00 AM for the current workday:

Shift	Shift Name	From Time	To Time
Initial Shift Definition	Shift A	7:00 AM	3:00 PM
Initial Shift	Shift B	3:00 PM	11:00 PM

Time Dimension Hierarchy Maintenance

The Hub and Workday Shift calendar can be loaded incrementally.

Reprocessing of Error Rows for Workday Shifts

Rows are moved to the error table because of dangling key issues for the following reasons:

- Shift Date was not provided.

- System reference was not provided.

8

Setting Up Item Dimensions

This chapter covers the following topics:

- Dimension Levels
- Item Dimension Setup Steps
- Item Master: Microsoft Excel Templates
- Item Dimension Maintenance

Dimension Levels

Manufacturing Operations Center enables items to be analyzed by different hierarchies. Any number of hierarchies can be built and analyzed. However, for out-of the box reporting, only three hierarchies are exposed in the OBIEE presentation layer:

- Item Hierarchy 01
- Item Hierarchy 02
- Item Hierarchy 03

The following diagram shows the structure of item hierarchies:
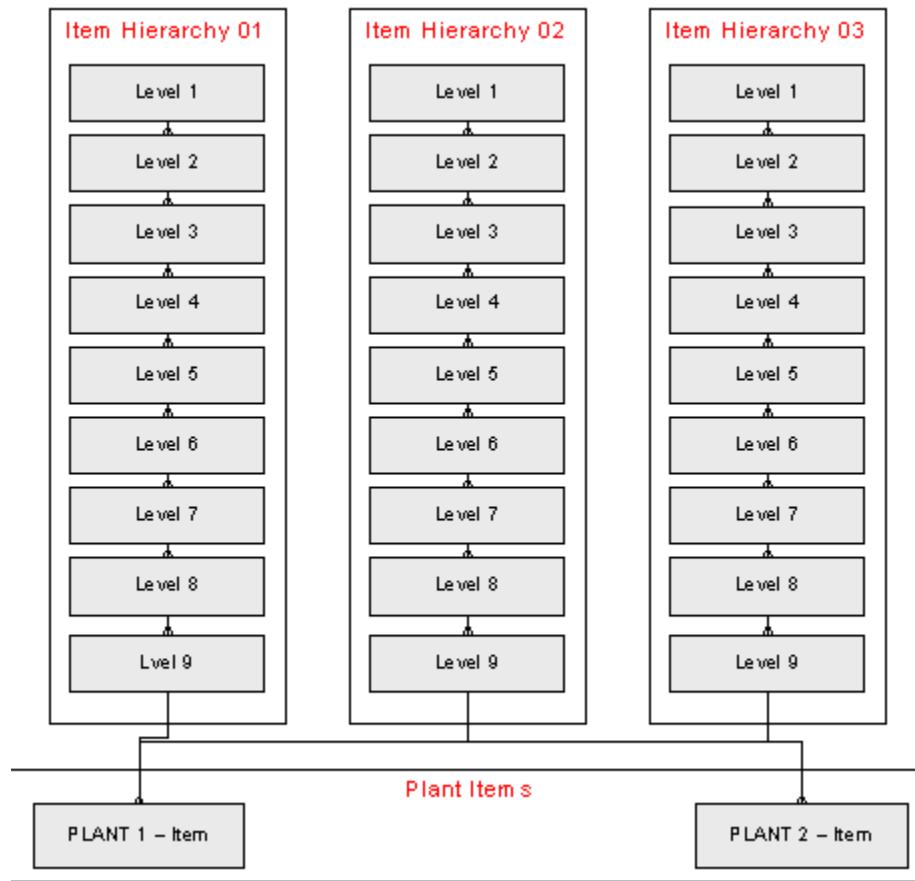
Item Dimension Setup Steps

The item dimension setup steps are as follows:

1. Load items.

2. Update the hierarchy master.

3. Load the item hierarchy.

Load Items

Data items are collected as follows for each Manufacturing Operations Center plant in the source systems:

• From EBS, based on the master data logic definitions.

• From Microsoft Excel.

To load items from EBS:

1. Run one of the following process flows:

    *   MTH_ITEMS_DIM_EBS_INIT_PF in the MTH Utilities project, under the MTHEBIIP module, for an initial data collection

    *   MTH_ITEMS_DIM_EBS_INCR_PF in the MTH Utilities project, under the MTHEBICP module, for an incremental data collection

2. Correct errors using SQL Developer or Oracle APEX. All errors in MTH_ITEMS_ERR must be fixed and the reprocess ready flag set to Y.

    Rows that are ready for reprocessing will be picked up in the next incremental run.

To load data from Microsoft Excel:

1. In the Microsoft Excel template, update MTH_ITEMS_MASTER.csv

2. In MTH Utilities, load the items into the MOC stage table by running MTH_ITEM_MASTER_XS_ALL_MAP in the OWB Mappings in the MTH Utilities project.

3. Load the items into the MOC Fact table by running one of the following processes:

    *   MTH_ITEMS_DIM_EXT_INIT_PF, in the MTH Utilities project, under the MTHEXIIP module, for an incremental data collection

    *   MTH_ITEMS_DIM_EXT_INCR_PF, in the MTH Utilities project, under the MTHEXICP module, for an incremental data collection

4. Correct errors using SQL Developer or Oracle APEX. All errors in MTH_ITEMS_ERR must be fixed and the reprocess ready flag set to Y.

    Rows that are ready for reprocessing will be picked up in the next incremental run.

Update the Hierarchy Master

To load EBS Category Set for the seeded hierarchy, change the Hierarchy name to the EBS Category Set name.

Load the Item Hierarchy

You can build item hierarchies in Manufacturing Operations Center or import them from EBS.

To load item hierarchies from EBS:

1. Load the item hierarchy from EBS by running one of the following processes:

- MTH_ITEM_HRCHY_EBS_INIT_PF for an initial data collection

- MTH_ITEM_HRCHY_EBS_INCR_PF for an incremental data collection

2. Correct errors using SQL Developer or Oracle APEX. All errors in MTH_ITEM_HIERARCHY_ERR must be fixed and the reprocess ready flag set to Y.

   Rows that are ready for reprocessing will be picked up in the next incremental run.

3. Any Item not assigned to a category set is set as Unassigned. This is done by running the MTH_ITEM_HRCHY_UA_EBS_INIT_PF process flow in the MTH Utilities project under the MTHEBIIP.

4. For OBIEE reporting, run the MTH_ITEM_DENORM_EBS_INIT_PF denorm process flow in the MTH Utilities project under the MTHEBIIP module.

5. To balance the hierarchy for OBIEE, run the MTH_ITEM_HRCHY_BAL_EBS_INIT_PF process flow.

To load item hierarchies from Microsoft Excel:

1. Update MTH_ITEM_DIMENSION_DENORM.csv in the Microsoft Excel template.

2. In the MTH Utilities, load the item hierarchy into the MOC staging table by running the MTH_ITEM_DIM_DENORM_XS_MAP in OWB Mappings.

3. Correct errors using SQL Developer or Oracle APEX. All errors in MTH_ITEM_HIERARCHY_ERR must be fixed and the reprocess ready flag set to Y.

   Rows that are ready for reprocessing will be picked up in the next incremental run.

4. Any Item not assigned to a category set is set as Unassigned. To eliminate Unassigned logic, run the MTH_ITEM_HRCHY_UA_EBS_INIT_PF process flow.

5. For OBIEE reporting, run the MTH_ITEM_DENORM_EBS_INIT_PF denorm process flow.

6. To balance the hierarchy for OBIEE, run the MTH_ITEM_HRCHY_BAL_EBS_INIT_PF process flow in the MTH Utilities project under the MTHEBIIP module.

Item Master: Microsoft Excel Templates

The Microsoft Excel template contains all columns from the item.

Hierarchy Master

The Hierarchy Master table is as follows:

Dimension Name	Hierarchy Name
ITEM	Inv.Items

Item Category

The Item Category table is as follows:

category_pk	system_fk	category_name	Description	ebs_category_id
cat1	dbi73d	cat1	new	-1
cat2		cat2		

Item Hierarchy Denorm

The Item Hierarchy Denorm table is as follows:

Hierarchy Name	Item	Level 9	Level 8	Level 7	Level 6	Level 5	Level 4	Level 3	Level 2	Level 1
Product Category	Item1	C9	C8	C7	C6	C5	C4	C3	C2	C1

Item Dimension Maintenance

Reprocessing of Error Items

Items are moved to the error table because of dangling key issues for the following reasons:

- The system reference is not available in the system table.

- The plant reference not available in the plant table.

- The primary unit of measure is not specified.

This data is fixed, and the reprocess flag switches from N to Y. During the next incremental item load, data from the error table is moved to the staging table for reprocessing.

Reprocessing of Error Item Hierarchy

Item hierarchy relationships are moved to the error table because of dangling key issues for the following reasons:

- The hierarchy name is not available.

- The category for the level or parent level is not available in the category table.

This data is fixed, and the reprocess flag switches from N to Y. During the next incremental item load, data from the error table is moved to the staging table for reprocessing.

9

Setting Up Equipment Dimensions

This chapter covers the following topics:

- Overview of Equipment Dimension
- Equipment Hierarchy Setup Process
- Equipment Hierarchy: Microsoft Excel Templates

Overview of Equipment Dimension

You can build multiple hierarchies for equipment, and these can be rolled up using different hierarchies for reporting. Manufacturing Operations Center provides four hierarchies, as described in this table:

Equipment Dimension Component	Design Component	Scope
Equipment Hierarchy	Resource Group Hierarchy	Hierarchy Relationship: Seeded
		Back-end Data: EBS or Microsoft Excel template provided.
Equipment Hierarchy	Department Hierarchy	Hierarchy Relationship: Seeded
		Back-end Data: EBS or Microsoft Excel template provided.

Equipment Hierarchy	Equipment Hierarchy 01 & 02	Hierarchy Relationship: Seeded
		Back-end Data: Microsoft Excel template provided.

Equipment Hierarchy dimension supports 10 levels. Four hierarchies are pre-seeded. Equipment hierarchy is divided into two parts:

- Defining equipment

- Building hierarchy on top of equipment (and resource)

  - Resource (for Resource Group and Department hierarchy)

  - Equipment (for Equipment hierarchy)

    Note: You must collect equipment from the source system in which it is defined.

Equipment Hierarchy Setup Process

Complete the following steps for the equipment hierarchy setup process:

1. Define hierarchy master and level lookups

2. Load equipment

3. Load equipment entities

4. Load resources

5. Load equipment hierarchy

Hierarchy Master and Level Lookup Definition

You can load seed data for the metadata.

Load Equipment

Equipment is loaded into Manufacturing Operations Center through a Microsoft Excel template.

1. Update MTH_EQUIP_MASTER.csv

2. Load the equipment by running the MTH_EQUIP_XS_ALL_MAP mappings in the MTH Utilities project.

Microsoft Excel Template: Equipment Master

The Equipment Master table is as follows:

Equipment Code	Source Org Code	Entity Name	Entity Type	System Code	Fixed Asset Value	Entity Description
MIXER1	MTH	MIXER1	EQUIPMENT	SCMC2MQ0		Equipment
BLOWER1	MTH	BLOWER1	EQUIPMENT	SCMC2MQ0		Equipment

All date columns are in the format of MM/DD/YYYY.

Load Equipment Entities

Equipment hierarchy entities such as Resource Group, Department, Organization, Line, Cell, and any entity other than Resources are loaded into MOC. Equipment entities can be loaded from EBS or Microsoft Excel.

To load equipment entities from EBS, run one of the following process flows:

- MTH_EQUIP_ENT_EBS_INIT_PF for an initial data collection

- MTH_EQUIP_ENT_EBS_INCR_PF

To load equipment entities from Microsoft Excel:

1. Update the MTH_ENTITY_MASTER.csv

2. Run the MTH_EQUIP_ENT_XS_ALL_MAP process flow.

3. Load the equipment entities into MOC staging tables by running one of the following process flows:

    - MTH_EQUIP_ENT_EXT_INIT_PF for an initial data collection

    - MTH_EQUIP_ENT_EXT_INCR_PF for an incremental data collection

Microsoft Excel Template: Entity Master

The Entity Master table is as follows:

Entity pk	Entity Name	Entity Type	System Code
LINE1	LINE1	LINE	-1
LINE2	LINE2	LINE	-1
LINE3	LINE3	LINE	-1
AREA1	AREA1	AREA	-1
AREA2	AREA2	AREA	-1
AREA3	AREA3	AREA	-1
SITE1	SITE1	SITE	-1
SITE2	SITE2	SITE	-1
SITE3	SITE3	SITE	-1

Load Resources

Load resources either from the Microsoft Excel utility or from EBS. To load resources from EBS:

1. Run one of the following processes:

   • MTH_RES_HRCHY_EBS_INIT_PF for an initial data collection

   • MTH_RES_HRCHY_EBS_INCR_PF for an incremental data collection

2. Correct errors using SQL Developer or Oracle APEX. All errors in MTH_RESOURCES_ERR must be fixed and the reprocess ready flag set to Y.

   Rows that are ready for reprocessing will be picked up in the next incremental run.

To load resources from Microsoft Excel:

1. Update MTH_RESOURCES.csv.

2. Run the MTH_RESOURCE_XS_ALL_MAP mappings.

3. Run one of the following processes:

   - MTH_RES_DIM_EXT_INIT_PF for an initial data collection

   - MTH_RES_DIM_EXT_INCR_PF for an incremental data collection

4. Correct errors using SQL Developer or Oracle APEX. All errors in MTH_RESOURCES_ERR must be fixed and the reprocess ready flag set to Y.

   Rows that are ready for reprocessing will be picked up in the next incremental run.

Microsoft Excel Template: Resource Master

The Resource Master table is as follows:

Resource Code	Resource Type	UOM	Capacity Units	Available 24 Hour Flag	Plant Code	System Code	Disable Date	Resource Name
500-1-M1	1	Ea	10		PLANT1	SCMC2MQ0	21/09/2006	Machine1
5269-2772-M1	1	Ea	11		PLANT1	SCMC2MQ0		Machine2
500-1-M2	1	Ea	12		PLANT1	SCMC2MQ0		Machine3
5269-2772-M2	1	Ea	13		PLANT1	SCMC2MQ0		Machine4

Load Equipment Hierarchy

Equipment hierarchies can be loaded from the Microsoft Excel utility or from EBS. To load resources from EBS:

1. Run one of the following processes:

   - MTH_EQUIP_HRCHY_EBS_INIT_PF for an initial data collection

   - MTH_EQUIP_HRCHY_EBS_INCR_PF for an incremental data collection

2. Correct errors using SQL Developer or Oracle APEX. All errors in MTH_EQUIP_ERR must be fixed and the reprocess ready flag set to Y.

   Rows that are ready for reprocessing will be picked up in the next incremental run.

3. Any Item not assigned to a category set is set as Unassigned. To eliminate Unassigned logic, run one of the following process flows:

   • MTH_ITEM_HRCHY_UA_ALL_INIT_PF for an initial data collection

   • MTH_EQUIP_HRCHY_UA_ALL_INCR_PF for an incremental data collection

4. For OBIEE reporting, run one of the following denorm process flows:

   • MTH_EQUIP_FD_EBS_INIT_PF for an initial data collection

   • MTH_EQUIP_FD_EBS_INCR_PF for an incremental data collection

To load resources from Microsoft Excel:

1. Update MTH_EQUIP_HRCHY_DEF.csv.

2. Run the MTH_EQUIP_HRCHY_XS_ALL_MAP mappings.

3. Run one of the following processes:

   • MTH_EQUIP_HRCHY_EXT_INIT_PF for an initial data collection

   • MTH_EQUIP_HRCHY_EXT_INCR_PF for an incremental data collection

4. Correct errors using SQL Developer or Oracle APEX. All errors in MTH_EQUIP_HIERARCHY_ERR must be fixed and the reprocess ready flag set to Y.

   Rows that are ready for reprocessing will be picked up in the next incremental run.

5. For OBIEE reporting, run one of the following denorm process flows:

   • MTH_EQUIP_FD_EXT_INIT_PF for an initial data collection

   • MTH_EQUIP_FD_EXT_INCR_PF for an incremental data collection

Equipment Hierarchy: Microsoft Excel Templates

Equipment Hierarchy

The Equipment Hierarchy table is as follows:

User Defined Hierarchy Name	Level Entity	Parent Entity	Level Num	Effective Date	System Code
Resource Group Hierarchy	MIXER1	7266-2772-MTHHUB1	10	01/01/2008	SCMC2MQ0
Resource Group Hierarchy	BLOWER1	7266-2772-MTHHUB1	10	01/01/2008	SCMC2MQ0
Department Hierarchy	MIXER1	7266-2772-MTHHUB1	10	01/01/2008	SCMC2MQ0
Department Hierarchy	BLOWER1	7266-2772-MTHHUB1	10	01/01/2008	SCMC2MQ0
Equipment Hierarchy 01	SITE1	SITE1	7	01/01/2008	SCMC2MQ0
Equipment Hierarchy 01	LINE1	SITE11	8	01/01/2008	SCMC2MQ0
Equipment Hierarchy 01	CELL1	LINE1	9	01/01/2008	SCMC2MQ0
Equipment Hierarchy 01	CELL1	LINE1	9	01/01/2008	SCMC2MQ0
Equipment Hierarchy 01	MIXER1	CELL1	10	01/01/2008	SCMC2MQ0
Equipment Hierarchy 01	BLOWER1	CELL2	10	01/01/2008	SCMC2MQ0

10

Load Data Reference and Transaction Data

EBS Data Collection

For data collected by EBS:

Entity	Initial Process Flow	Incremental Process Flow	Error Table
Production Schedule	MTH_WO_EBS_INIT_PF	MTH_WO_EBS_INCR_PF	MTH_PRODUCTION_SCHEDULES_ERR
Material Produced	MTH_WO_EBS_INIT_PF	MTH_WO_EBS_INCR_PF	MTH_PROD_MTL_PRODUCED_ERR
Equipment Shifts	MTH_EQUIP_SHIFTS_EBS_INIT_PF	MTH_EQUIP_SHIFTS_EBS_INCR_PF	

Microsoft Excel Template Data Collection

For data collected by Microsoft Excel templates:

Entity	CSV File	XS Mapping	Initial PF	Incremental PF	Error Table
Item Cost	MTH_ITEM_COST.csv	MTH_ITEM_COST_XS_MAP	MTH_ITEM_COST_EXT_INIT_PF	MTH_ITEM_COST_EXT_INCR_PF	MTH_ITEM_COST_ERR

Resource Cost	MTH_RESOURCE_COST.csv	MTH_RESOURCE_COST_XS_ALL_MAP	MTH_RES_COST_EXT_INIT_PF	MTH_RES_COST_EXT_INCR_PF	MTH_RESOURCE_COST_ERR
Production Schedule	MTH_PROD_SCHEDULES.csv	MTH_WO_XS_ALL_MAP	MTH_WO_EXT_INIT_PF	MTH_WO_EXT_INCR_PF	MTH_PRODUCTION_SCHEDULES_ERR
Material Produced	MTH_PROD_MTL_PRODUCED.csv	MTH_WO_ITEMS_XS_ALL_MAP	MTH_WO_ITEMS_EXT_INIT_PF	MTH_WO_ITEMS_EXT_INCR_PF	MTH_PROD_MTL_PRODUCED_ERR
Produced Transactions	MTH_MTL_PRODUCED_TXN.csv	MTH_MTL_PRD_TXN_XS_ALL_MAP	MTH_MTL_PRD_TXN_EXT_INIT_PF	MTH_MTL_PRD_TXN_EXT_INCR_PF	MTH_PROD_MTL_PRODUCED_TXN_ERR
Produced Transaction Lots	MTH_MTL_PRODUCED_TXN_LOT.csv	MTH_MTL_PRD_TXN_LOT_XS_ALL_MAP	MTH_MTL_PRD_TX_LOT_EXT_INIT_PF	MTH_MTL_PRD_TX_LOT_EXT_INCR_PF	MTH_MTL_PRODUCED_TXN_LOT_ERR
Production Segments	MTH_PROD_SEGMENTS.csv	MTH_PROD_SEGMENTS_XS_ALL_MAP	MTH_WO_SEG_EXT_INIT_PF	MTH_WO_SEG_EXT_INCR_PF	MTH_PRODUCTION_SEGMENTS_ERR
Segment Transactions	MTH_PROD_SEGMENTS_TXN.csv	MTH_PROD_SEG_TXN_XS_ALL_MAP	MTH_WO_SEG_EXT_INIT_PF	MTH_WO_SEG_EXT_INCR_PF	MTH_PROD_SEGMENTS_TXN_ERR
Material Consumed	MTH_MTL_CONSUMED.csv	MTH_MTL_CNS_XS_ALL_MAP	MTH_MTL_CMD_EXT_INIT_PF	MTH_MTL_CMD_EXT_INCR_PF	MTH_PROD_MTL_CONSUMED_ERR
Consumed Transactions	MTH_MTL_CONSUMED_TXN.csv	MTH_MTL_CNS_TXN_XS_ALL_MAP	MTH_MTL_CMD_TXN_EXT_INIT_PF	MTH_MTL_CMD_TXN_EXT_INCR_PF	MTH_PROD_MTL_CONSUMED_TXN_ERR
Consumed Transaction Lots	MTH_MTL_CONSUMED_TXN_LOT.csv	MTH_MTL_CNS_TXN_LOT_XS_ALL_MAP	MTH_MTL_CMD_TX_LOT_EXT_INIT_PF	MTH_MTL_CMD_TX_LOT_EXT_INCR_PF	MTH_MTL_CONSUMED_TXN_LOT_ERR

Resource Requirement	MTH_RES_REQ.csv	MTH_RES_REQ_XS_ALL_MAP	MTH_RES_REQ_EXT_INIT_PF	MTH_RES_REQ_EXT_INCR_PF	MTH_RESOURCE_REQUIREMENTS_ERR
Resource Transactions	MTH_RES_TXN.csv	MTH_RES_TXN_XS_ALL_MAP	MTH_RES_TXN_EXT_INIT_PF	MTH_RES_TXN_EXT_INCR_PF	MTH_RESOURCE_TXN_ERR
Sales Orders	MTH_WO_SALES_ORDERS.csv	MTH_WO_SALES_ORDERS_XS_ALL_MAP	MTH_WO_SALES_ORDER_EXT_INIT_PF	MTH_WO_SALES_ORDER_EXT_INCR_PF	MTH_WO_SALES_ORDERS_ERR
Equipment Shifts	MTH_EQUIP_SHIFTS.csv	MTH_EQUIP_SHIFTS_XS_MAP	N/A	N/A	N/A

11

Profile Options

This chapter covers the following topics:

- MTH: Item Classification for Extensible Attributes
- MTH: Equipment Classification for Extensible Attributes
- MTH: Catch All Shift Name
- MTH: System Global Name

MTH: Item Classification for Extensible Attributes

Profile Values: Item hierarchy names

Default Profile Value: None

This profile option is used to define item classification for extensible attributes. The item classification gets the leaf node values from the selected item hierarchy.

- This profile option is required at the Manufacturing Operations Center site level.

- If you modify the hierarchy name or level name, the updated hierarchy name or level name appears in the profile option values.

- If you change the profile value, the classification takes the latest value. The attribute groups defined for the new category appear in the User Defined Attributes (UDA) user interface.

MTH: Equipment Classification for Extensible Attributes

Profile Values: Equipment Hierarchy Name.Level Name

Default Profile Value: Department Hierarchy.Resource

This profile option is used to define extensible attributes for equipment. The values for the profile option are a combination of the equipment hierarchy and the level.

Manufacturing Operations Center supports four equipment hierarchies.

Seeded Profile Values: None. The profile value displays the hierarchy name and the level name as defined in the equipment hierarchy. For example, if the equipment hierarchy name and the level lookup values are customized as Functional Hierarchy and Line, then the profile value appears as Functional Hierarchy.Line.

For example, suppose that Equipment Hierarchy 01 is defined as follows:

Equipment	Line	Area	Site	Plant
EQ001	L1	A1	S1	P1
EQ002	L1	A1	S1	P1
EQ003	L1	A1	S1	P1
EQ004	L2	A1	S1	P1
EQ005	L2	A1	S1	P1
EQ006	L2	A1	S1	P1
EQ007	L3	A2	S2	P1
EQ008	L3	A2	S2	P1

Profile Values from the previous hierarchy are as follows:

- Equipment Hierarchy 01.Equipment

- Equipment Hierarchy 01.Line

- Equipment Hierarchy 01.Area

- Equipment Hierarchy 01.Site

- Equipment Hierarchy 01.Plant

If the Profile Value is selected as Equipment Hierarchy 01.Line, then the Equipment is classified by the Entities that belong to Line. Three classifications are used to define attribute groups, as shown here:

Classification	AG1	AG2	AG3	AG4

L1	Yes	Yes	No	No
L2	No	Yes	Yes	No
L3	No	No	Yes	Yes

AG1, AG2, AG3, and AG4 are the Attribute groups defined in UDA.

- This profile option is required at the Manufacturing Operations Center site level.

- The profile values display values of all the seeded equipment hierarchies and the level combinations.

- If you modify the hierarchy name or level name, the updated hierarchy name or level name appears in the profile option values.

If you change the profile value, the classification takes the latest value, and the Attribute groups defined for the new entity type appear in the UDA user interface. For example, suppose that the following three classifications are defined attribute groups:

If you change the Profile Value to Equipment Hierarchy 01 Site, then the Equipment is classified by the entities belonging to Site. Classifications used to define attribute groups are as follows:

Classification	AG1	AG2	AG3	AG4
L1	Yes	Yes	No	No
L2	No	Yes	Yes	No
L3	No	No	Yes	Yes

MTH: Catch All Shift Name

Profile Values: Input Text Field

Default Profile Value: Catch All

This profile option is used to define the name for a Catch All Shift that is used in OBIEE. It can be any user-defined name. The Catch All shift is populated for:

- Every Day in the Hub calendar that does not have a Workday Shift in the Workday Shift Calendar

- One row per Workday for Workday Shifts that do not cover 24 hours in a day

MTH: System Global Name

Profile Values: Input Text Field

Default Profile Value: None

This profile option is set in an EBS 11.5.10 environment. When defining the source organization location in OWB, use the name provided in the profile as Service Name.

12

Setting Up Tags and Contextualization

This chapter covers the following topics:

- Tag Setup
- Customizing Business Rules in OWB
- Contextualization Entities
- Contextualization Methods
- Tag-Based Contextualization
- Contextualization by Schedule
- Contextualization by Schedule Alternative Approach
- Manual Contextualization
- Non-contextualized Rows
- Reason Code Setup
- Loading Tag Data into Summary Tables
- Menus and Responsibility for Contextualization

Tag Setup

To set up a tag, you must load the Tag Master and associate the tag with entities. You can optionally set up a business rule.

To set up a tag:

1. In the Microsoft Excel template, update the tags in MTH_TAG_MASTER_UI.csv

2. Load the Tag Master by running the MTH_TAG_MASTER_XS_MAP in OWB Mappings.

3. Assign tags to equipment in the Tag Information tab of the Tag Setup user interface.

4. Add tag attributes and unit of measure information in the Tag Attributes tab of the Tag Setup user interface.

5. Associate tags to the MOC entity or Attribute Group in the Tag to Entity Mapping tab of the Tag Setup user interface.

6. Optionally, you can set up business rules.

Hard-coded tag values are as follows:

Tag Value	Meaning	Comment
1	Run	Equipment is in use.
2	Idle	Equipment is not in use and is available.
3	Down	Equipment not in use and is not available.

Customizing Business Rules in OWB

To customize business rules in OWB:

1. Filter condition setup

2. Join condition setup

3. Business rule setup

4. Business rule synchronization

Example

Consider the following example:

- Equipment Mixer1, belonging to Plant1, is fitted with two devices which read its temperature and pressure.

- Unless the line pressure and mixer temperature reaches a certain level, the equipment is not considered to be available.

- The conditions for the equipment to be available are:

    - Temperature must be > 100 F

- Pressure must be > 50 psi

- Input tags configured:
  - TAG_PRS_MIXER1

  - TAG_TEMP_MIXER1

- Output tags configured:
  - TAG_STATUS_MIXER1

Filter Condition Setup

1. Open MTH_TMPL_2_TO_1_BIZ_RULE_PMAP in the editor in MTH project pluggable map.

2. Click on the Tag Filter header.

3. Click on the Edit button against the Filter Condition in the left panel

4. In the Expression Builder, enter the tag details which will be the components of the Business Rule.

5. In this example, the tags are:
   - TAG_PRS_MIXER1

   - TAG_TEMP_MIXER1

6. Validate the expression before closing the Expression Builder.

Join Condition Setup

1. For the status tag value, temperature and pressure tags are only joined when:
   - Group ID is the same

   - Equipment is the same

2. Select the Joiner.

3. Click the Edit button.

4. Enter the condition in the Join Condition window.

Business Rule Setup

To specify the business rule:

1. Define the output tag and its value.

2. Click the Expression Editor button for the Tag Code's Outgroup of Business Rule.

3. Enter the Status Tag.

4. For Tag Data, click the Expression Editor button for the Tag Data's Outgroup of Business Rule, and enter the condition.

5. Save the Pluggable Mapping.

Business Rule Synchronization

1. Open the MTH_DD_BUSINESS_RULES_MAP mapping in the editor.

2. Select the MTH_DD_BUSINESS_RULES_MAP in the Selected Object List.

3. Right-click on the Object and select Synchronize.

4. Select the Pluggable Map.

5. Set the synchronization to Inbound, from pluggable mapping.

6. Set the Matching Strategy to Match by Object Name.

7. Set the Synchronize Strategy to Replace.

8. Click the OK button.

9. Save the Map.

10. Redeploy the Business Rule Map.

Contextualization Entities

Manufacturing Operations Center contextualizes tag data for the following entities:

1. **Equipment:** Equipment context is available from the setup between the tag and equipment. No additional logic is available to get the equipment context if the association is not specified during tag setup.

2. **Workorder:** Work order context comes from the tag or the equipment production

schedule.

3. **Operation:** The operation context comes from a tag or equipment production schedule.

4. **Item:** The item context can come from a tag or the equipment production schedule.

5. **Shift:** The shift context is available from the equipment shift schedule.

Contextualization Methods

You must specify one of the following contextualization methods at the equipment level during contextualization setup:

- **Tag based Contextualization:** Business context is given through equipment tags.

- **Schedule based Contextualization:** Business context is determined by referring to schedules.

- **Manual Contextualization:** Business context is entered manually and is not available as a tag and should not be determined by referring to schedules.

You must construct the primary key for Work Order, Segment, Shift, Equipment, Item in the required format in the transaction tables. The formats for primary keys are:

- Work Order: '<Work order id>-<MOC Plant code>"

- Segment: "<Segment number>-<Work order id>-<Plant code>"

- Shift: "<Shift_date>-<Shift_num>-<Plant_code>"

- Equipment:" <Equipment_id>-<Plant_code>"

- Item: "<Equipment_item_id>-<Organization_code>"

If the primary key is not in the required format, contextualization errors can occur.

Tag-Based Contextualization

The logic for tag-based contextualization is as follows:

Tag	Description
Equipment	The equipment ID from the source system

Shift	The shift number
Workorder	The ID from the source system; ip_entity_id/batch_id/repetitive_schedule_id
Item	The Inventory Item ID from the source system
Segment	The Operation number

If tags are not available for Equipment and Shift, the context can be determined by using the schedules method.

> **Warning:** You must construct the primary key for Work Order, Segment, Shift, Equipment, Item in the required format in the transaction tables. If the primary key is not properly constructed in the required format, contextualization errors and complications can occur.

Contextualization by Schedule

The logic for contextualization by schedule is as follows:

Tag	Description
Equipment	The equipment context is acquired by referring to the tag setup.
Shift	The shift of the equipment is located in the read time in the Equipments Shifts Table.
Workorder	The work order is located in the read time in the scheduled from and to date of a work order in mth_production_schedules_f.
Operation	The operation is located in the Equipment Production Schedules by using the shift and the equipment.
Item	Using work order, find the item from the production material produced table.

Contextualization by Schedule Alternative Approach

Manufacturing Operations Center_EQUIP_PROD_PERFORMANCE_F is a counterpart of Manufacturing Operations Center_EQUIP_PROD_SCHEDULES_F, and it stores the actual start and end times of a shift. You can populate this table using OWB from an external source.

The contextualization based on schedules is done in the schedules tables (equipment production schedules, production schedules, and so on), but Manufacturing Operations Center has another configurable mapping in which the contextualization is based on the actual data from Manufacturing Operations Center_EQUIP_PROD_PERFORMANCE_F. This configurable mapping can be used instead in the contextualization logic.

The logic for contextualization by equipment production performance is as follows:

Tag	Description
Equipment	The equipment context is acquired by referring to the tag setup.
Shift	The context is extracted from mth_equip_prod_performance_f using the read time.
Workorder	The context is extracted from mth_equip_prod_performance_f using the read time.
Operation	The context is extracted from mth_equip_prod_performance_f using the read time.
Item	The context is extracted from mth_equip_prod_performance_f using the read time.

Manual Contextualization

If the manual contextualization method is selected, Manufacturing Operations Center does not apply any logic to get the context, and the context is entered manually in the manual contextualization user interface. Manufacturing Operations Center only gets the equipment context from the tag setup

Non-contextualized Rows

If context is missing after applying the contextualization logic, Manufacturing Operations Center moves the rows to either the mth_tag_readings or the errors table.

1. If a missing context is set up as mandatory, it is moved to the errors table.

2. If a missing context is set up as optional, it is moved to the readings table.

This column in Manufacturing Operations Center_TAG_READINGS takes on the following values:

Y = if the row is contextualized

N = if the row is not contextualized

Reason Code Setup

Tags can be used to display the reason for down status or scrap quantity. As a one-time setup, you can define a list of all possible reason codes and reason meanings in the plant. In the business meaning setup for the reason tag, map the value of the tag to a reason code.

Reason Code can be setup utilizing FND Lookup. The two lookup types seeded by Manufacturing Hub are:

• MTH_SCRAP_REASON (for setting up scrap reasons)

• MTH_EQUIP_DOWNTIME_REASON (for setting up downtime reason

Reason Code setup is accessed from the Development Manager responsibility in the Lookups Menu.

Loading Tag Data into Summary Tables

To load tag data into summary tables:

1. Load the data into tag readings tables by running one of the following process flows:

    • MTH_DEV_DATA_INIT_PF in the MTH Utilities project under the MTHDDIIP module for an initial data collection

    • MTH_DEV_DATA_INCR_PF in the MTH Utilities project under the MTHDDICP module for an incremental data collection

2. Load the data into summary tables by running one of the following process flows:

- MTH_EQUIP_SUMMARY_INIT_PF in the MTH Utilities project under the MTHDDIIP module for an initial data collection

- MTH_EQUIP_SUMMARY_INCR_PF in the MTH Utilities project under the MTHDDICP module for an incremental data collection

3. If reasons are imported through tags, load Reasons Reading by running one of the following process flows:

- MTH_TAG_REASONS_INIT_PF in the MTH Utilities project under the MTHDDIIP module for an initial data collection

- MTH_ TAG_REASONS _INCR_PF in the MTH Utilities project under the MTHDDICP module for an initial data collection

Menus and Responsibility for Contextualization

Contextualization Setup

Responsibility: Manufacturing Operations Center Administrator

Menu: Manufacturing Operations Center_ADMINISTRATOR_MENU

Manual Contextualization

Responsibility: Manufacturing Operations Center User

Menu: Manufacturing Operations Center_USER_MENU

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Setting Up Extensible Attributes

This chapter covers the following topics:

- Extensible Attributes Setup Steps
- Setting Up Profiles
- Creating Attribute Groups
- Create Attributes
- Defining Classifications
- Attaching Attribute Groups to Classifications
- Creating Pages
- Populating Data

Extensible Attributes Setup Steps

Extensible attribute setup consists of the following steps:

1. Set up the profile

2. Create attribute groups

3. Create attributes.

4. Define classifications (for the Others entity)

5. Attach attribute groups to classifications

6. Populate attributes for single rows and multi-rows

7. Reporting

Setting Up Profiles

To set up the profile, use the following profile options:

- MH: Equipment Classification for Extensible Attributes

- MH: Item Classification for Extensible Attributes

Creating Attribute Groups

You can create single-row or multi-row attribute groups. For multi-row attribute groups, you can have data stored in multiple rows. In single-row attribute groups, existing data is overwritten when new data is entered.

Complete these steps to configure attribute groups:

Create Attributes

Create or update attributes in the attribute groups as seen here below:

Defining Classifications

Define classifications for the entity Others. For all other entities, classifications are seeded based on profiles.

Entity	Classification
Equipment	Classified by the MH: Equipment Classification for Extensible Attributes profile option.
Item	Classified by the MH: Item Classification for Extensible Attributes profile option.
Work Order	Work Order type
Others	User-defined classifications

Attaching Attribute Groups to Classifications

Attach the created attribute groups to the appropriate classifications as seen here below:

Creating Pages

Create pages using the Attribute Groups as seen here below:

Populating Data

Single Row Attributes

For Extensible Attributes, data can be populated from OWB into interface tables, or pages if it is a single row of data. For data populated from OWB into interface tables, run the following process flows in the MTHUDANP module in MOC after loading the data.

Entity	Process Flow
Equipment	MTH_EXT_ATTR_EQ_PF
Item	MTH_EXT_ATTR_IT_PF
Work Order	MTH_EXT_ATTR_PS_PF
Others	MTH_EXT_ATTR_OT_PF

Multi-Row Attributes

To populate multi-row attributes for the Equipment entity:

1. Set up the attribute tags for entity mapping.

2. Run OWB process flows to load data sequentially.

3. Run the MTH_DEV_DATA_INCR_PF process flow in the MTHDDICP module in MOC.

4. Run the MTH_EXT_ATTR_TB_PF process flow in the MTHUDADP module in MOC.

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Setting Up the OBIEE Repository and Dashboards

OBIEE Repository Setup

Follow the steps and the OBIEE version compatibility in the APS 12.1 Family Pack Readme.

Dashboards

Manufacturing Operating Center includes:

- One Manufacturing Operations Center catalog

- Three dashboard pages

    - Overall Equipment Effectiveness (By Plant)

        - Drill down Page - Overall Equipment Effectiveness (By Department)

        - Drill Down Page – Equipment Downtime Analysis

            - Link Report

            - Drill Report

    - Historical Batch Analysis

    - Performance Analysis

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Maintenance of Manufacturing Operations Center

Scheduling Process Flows

To avoid manually running process flows for incremental data collections, OWB allows them to be scheduled on the frequency required and set by users. To implement scheduling functionality for process flows:

1. Create the Schedule module.

2. Enter the name and description for Schedule Module Associate With a Location.

   This location should be a target location.

3. Create a schedule.

4. Specify the start time, end time, setup, and frequency.

5. Right-click on process flow and click the Configure button.

6. Select the created schedule in the Referred Calendar Field.

7. In the control center, deploy the schedule.

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