

**Oracle® Design to Release Integration Pack for
Agile Product Lifecycle Management for Process
and Oracle® Process Manufacturing 3.1 -
Implementation Guide**

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Oracle Design to Release Integration Pack for Agile Product Lifecycle Management for Process and Oracle Process Manufacturing 3.1 – Implementation Guide

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Preface

Welcome to the Oracle Design to Release Integration Pack for Agile Product Lifecycle Management for Process and Oracle Process Manufacturing 3.1 - Implementation Guide.

Oracle Application Integration Architecture (AIA) provides the following guides and resources for this release:

Oracle AIA Guides

- Oracle Fusion Middleware Infrastructure Components and Utilities User's Guide for Oracle Application Integration Architecture Foundation Pack 11g Release 1 (11.1.1.4.0)
- Oracle Fusion Middleware Installation and Upgrade Guide for Oracle Application Integration Architecture Foundation Pack 11g Release 1 (11.1.1.4.0)
- Oracle Fusion Middleware Concepts and Technologies Guide for Oracle Application Integration Architecture Foundation Pack 11g Release 1 (11.1.1.4.0)
- Oracle Fusion Middleware Reference Process Models User's Guide for Oracle Application Integration Architecture Foundation Pack 11g Release 1 (11.1.1.4.0)
- Oracle Fusion Middleware Migration Guide for Oracle Application Integration Architecture 11g Release 1 (11.1.1.4.0)
- Oracle Fusion Middleware Developer's Guide for Oracle Application Integration Architecture Foundation Pack 11g Release 1 (11.1.1.4.0)

Additional Resources

The following resources are also available:

Resource	Location
Oracle Application Integration Architecture: Product-to-Guide Index	Oracle Technology Network: http://www.oracle.com/technetwork/index.html
Known Issues and Workarounds	My Oracle Support: https://support.oracle.com/
Release Notes	Oracle Technology Network: http://www.oracle.com/technetwork/index.html
Documentation updates	My Oracle Support: https://support.oracle.com/

Chapter 1: Agile PLM for Process Integration for Oracle E-Business Suite

This chapter provides an overview of the Agile PLM for Process integration with Oracle's E-Business Suite and discusses:

- Agile PLM for Process to Oracle E-Business Suite Processes
- Solution Design Assumptions and Constraints
- Solution Security Considerations

Overview

Agile PLM for Process (PLM4P) enables companies to manage not just individual product lifecycles, but complete product portfolios and programs tied to product conception, design, launch, maturity, and phase-outs. The primary users of Agile PLM for Process are generally directly or indirectly involved in the management of PLM specifications. The content managed by these users in Agile often has direct bearing on processes managed in other enterprise systems such as Enterprise Resource Planning systems (ERP) and manufacturing systems.

The Global Specification Management (GSM) module of Agile PLM for Process enables you to create an enterprise wide "single version of the truth" of the entire product record, including finished products, manufacturing processes, bills of materials (BOMs), ingredients, and packaging materials. It provides you with collaborative business processes to create, review, and approve all specifications included in the product record—in all languages, cultures, units of measure, and currencies—throughout the enterprise and across the supply chain. The entire product genealogy is connected, allowing you to ensure data traceability and attain an integrated view of the interrelationships among all specifications. Over 90% of Agile PLM customers use Product Lifecycle Management (PLM) as the primary system for managing product design information. This source of truth must then feed the latest product design information into manufacturing systems. Timely and accurate propagation of product design information from PLM to manufacturing systems is critical for companies to ensure that products are built to the right specifications, thereby enabling a low time to market and eliminating excess and obsolete inventory.

Content Synchronization and Syndication (CSS) publishes, or syndicates, a subset of GSM specification data to downstream systems from Agile PLM for Process. CSS typically syndicates this data using an XML-based format. Publications are preconfigured objects that define the final destination of the data being syndicated. These publications are referred to as TIPs, or Transactive Item Publications. You use publications to send specification data to internal systems using a standard output structure.

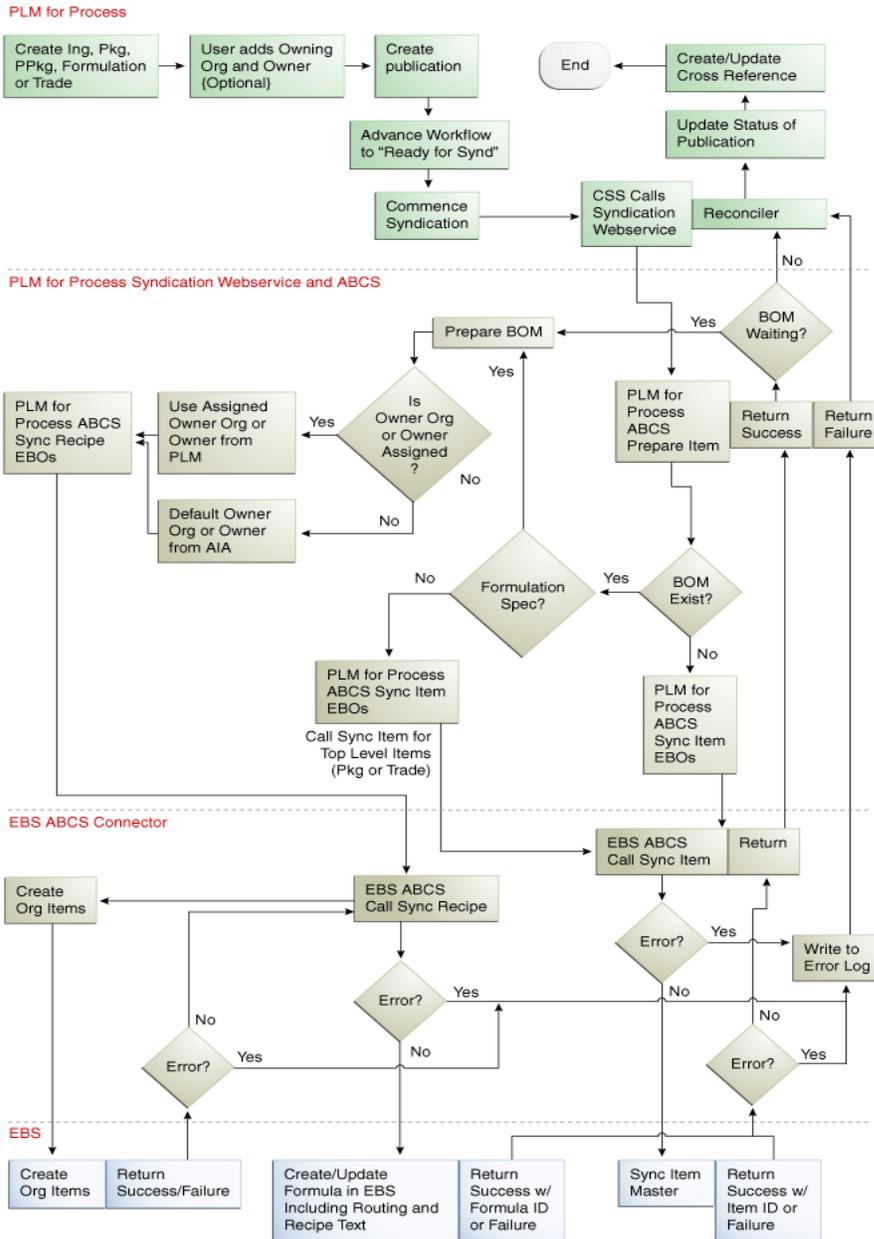
Oracle Process Manufacturing (OPM) automates the entire product lifecycle for recipe-based manufacturing ranging from new product development, recipe management, and production to cost, quality, and regulatory management. It enables you to formulate products to individual customer specifications, manage variability, optimize capacity, and drive continuous process enhancement. OPM uses status control and automated approval workflows to streamline the movement of products from early experimental stages through piloting and into full production. Formulas, routings, and their components comprise recipes that can be managed at a global level, filtered down through the organization, and adjusted to meet local demands. These definitions allow the reuse of recipes to suit your operational needs. Using OPM, you can maintain multiple formula versions and types—including standard, plant-specific, planning, and costing formulations—while exercising rules-based control to guarantee that you always use the appropriate formula for a designated activity. OPM saves time and reduces errors by automating work processes, enabling easy re-use and modification of proven recipes to facilitate the development of new formulations that meet desired specifications and the transfer and scale-up of approved recipes to production.

Oracle E-Business Suite enables you to optimize production capacity, from raw materials through the final product – all from applications that are built on unified information architecture. This unified data model provides a single, accurate view of your manufacturing process, so you can configure customer orders, optimize subcontracting, and manage for cost, quality, and compliance. It enables you to speed implementation, optimize performance, streamline support, and maximize return on your investment. By using E-Business Suite, you can share information across the organization so you can make smarter decisions with better information. The integration between Agile PLM for Process (PLM4P) and Oracle E-Business Suite is designed to address the primary use cases around synchronization of product content information between Agile PLM for Process and OPM. The Design to Release: Agile Product Lifecycle Management for Process and OPM Process Integration Pack (PIP) is designed to enable and integrate Product Development process between Agile PLM for Process and Oracle E-Business Suite. This allows a rapid implementation of Oracle's next generation integrated enterprise PLM processes helping customers to reduce delays in product launches, decrease exposures to product compliance issues, and to avoid expensive inventory write-offs that directly impact the bottom line. This integration aims to meet the following objectives:

- The integration follows a reference process task flow model.
- Data accuracy and data integrity are maintained at all times in both systems.
- The business process flow and data field mappings, as well as the transformations, are easy to configure and support, without changing the core code, the different ways in which customers in the same vertical carry out each of the supported business processes.
- Robust exception handling is done, including ease of understanding for end users, strong notification configurability, and ease of troubleshooting.

Agile PLM for Process to Oracle E-Business Suite Processes

This diagram illustrates the overall business process flow from Agile PLM for Process to Oracle E-Business Suite:



Overall business process flow diagram of raw materials, recipes, and finished goods

The overall business process flow from Agile PLM for Process to Oracle E-Business Suite includes the following processes:

- [Raw Material Syndication](#)
- [Recipe Syndication](#)
- [Finished Good Syndication](#)

Agile PLM for Process Syndication Overview

In Agile PLM for Process, Content Synchronization and Syndication (CSS) publishes, or syndicates a subset of Global Specification Management (GSM) specification data to external or downstream systems.

CSS syndicates GSM specification data to downstream systems based on specific configurable publication targets. Publications are preconfigured objects that define the final destination of the data being syndicated. These publications are referred to as TIPs, or Trans-active Item Publications. A TIP can be created on the CSS tab for a given specification. Once a TIP is created for a specification, it can be workflowed as a standalone object to trigger the syndication, or it can be tied to the parent specification's GSM workflow, allowing the TIP to change workflow states as the specification's workflow changes. Contact Oracle Consulting Services for more information about how to tie the TIP workflow to the specification workflow. An asynchronous process will poll for TIPs that have reached a syndicable state and will commence syndication of the associated specifications for each.

Agile PLM for Process automatically creates TIPs for sub-components and external output ingredients (in the case of formulation specifications) if they do not exist when a TIP is added to the parent specification in Agile PLM for Process. These TIPs still need to be workflowed to the appropriate state in order for the syndications to occur. The sub-components must exist in E-Business Suite prior to the syndication of the parent spec.

Initial Publication

Trading Partner	Publication Type	Target Market	Initial Publication	Last Updated	Info Provider	Manufacturer	Current Status
US » UCC » SuperValu (Anniston, AL) - 0041130051623	Initial Load	US	-----	3/24/2009	CPI	CPI	Draft GS1:

[TIP tied to specification in GSM, Agile PLM for Process](#)

Raw Material Syndication

Agile PLM for Process application creates raw materials such as ingredients, packaging and printed packaging. Once the material is approved, it is syndicated to Oracle E-Business Suite for further definition, procurement, and planning.

As a product developer for a food and beverage company, you might work on a new formula, which needs an ingredient or a packaging or printed packaging material--a *raw material*--that has not yet been defined in Agile PLM for Process. If you use raw material for the new formula, you have to first create the appropriate raw material specification in Agile PLM for Process and add the necessary information to meet the needs of the new formula that you want to create. This raw material specification is workflowed through the appropriate stages and receives the necessary signatures from functional areas such as Product Development, Food Safety, and Strategic Sourcing. During the progression of this workflow, either the product developer or the Strategic Sourcing team locates a supplier for this raw material and contracts this supplier to source the raw material based on the agreed specifications.

At any stage in the raw material's lifecycle, the raw material can be used within the Agile PLM for Process formulation specification. At some point prior to the syndication of the formulation specification, the raw material needs to be syndicated to the Oracle E-Business Suite. If the item does not exist in the E-Business Suite, it will be created, and a PLM for Process cross-reference is created based on the concatenation of the Owning Organization and Item ID of the newly created item. If the item already exists and is updateable, it is updated in the E-Business Suite. If the Item is not in an updateable state in the E-Business Suite, then the appropriate error message is returned.

If the item is a packaging specification with packaging sub-components, then it is also modeled as an OPM formula. During syndication, the formula is created after the item in E-Business Suite is created. After the formula is created in OPM, a second PLM for Process cross-reference will be created on the packaging specification to represent the formula. This will be a concatenation of the Organization and Formula Name of the newly created OPM formula. Each new issue of the specification will cause a new formula version to be created, even though the main packaging item is not revisioned.

For more information, see [Raw Material Syndication Process](#) and [Recipe Syndication Process](#).

Recipe Syndication

The creation of a formula/recipe originates in Agile PLM for Process Global Specification Management and is represented as a formulation specification. A formulation specification describes the manufacturing and packaging processes used to produce a product. It consists of process steps, bill of materials (BOMs), loss, yields and manufacturing plants along with other information. Once you fully define a formulation, it will be sent through the appropriate approval process for review and sign-off. The formulation can be syndicated at any point in its lifecycle but typically this happens once it is approved. When syndicated, it is sent to OPM where a formula will be created which consists of the same bill of material as the Agile formulation specification. Upon the successful syndication, an ID known as the cross-reference or equivalent is created in Agile which represents the formula created in OPM. The format of the cross-reference will be a concatenation of the organization and formula name of the newly created formula.

As a prerequisite for all specifications that have a BOM to be successfully syndicated, all the BOM items need to previously exist in E-Business Suite. This includes both owned and referenced outputs. The items will have to be syndicated prior to the formulation syndication. If any of the items do not exist in E-Business Suite, the process is halted.

When the items are syndicated prior to the formulation, they will be created in E-Business Suite's Inventory Management as Master Items. When the formulation is syndicated, Org Items are created for each one if they do not already exist. The organization used will be the one either defined on the formulation in Agile or taken from the configuration file.

When syndicating a new issue of the formulation in Agile, a new version of the formula will be created in OPM.

For more information, see [Recipe Syndication Process](#).

Finished Good Syndication

The creation of a finished good is represented as a trade specification and starts in Agile PLM for Process. A trade specification contains many of the attributes required to describe the finished products sold by your company. The product developer creates the trade specification and adds the necessary data such as an ingredient or output material (which represents the main product), the packaging BOM, lower level Trade Item, dimensions, and other attributes to the trade specification. At any point in the trade item's lifecycle, you can decide to syndicate it to the Oracle E-Business Suite for planning, procurement, and manufacturing. Typically this will be done after it is approved.

As a prerequisite for all specifications that have a BOM (such as packaging, formulation, and trade) to be successfully syndicated, all the BOM items need to previously exist in E-Business Suite. The items will have to be syndicated prior to the syndication. If any of the items do not exist in E-Business Suite, the process is halted.

When syndicated, a master item will be created in Inventory Management to represent the trade. As well, a formula will be created in OPM to represent the bill of materials for the trade. The formula will contain the trade item's packaging BOM, ingredient, lower level trade items, and the item previously created to represent the current trade in E-Business Suite. Just like formulation syndication, the corresponding org items will be created in Inventory Management for each item of the bill of material.

Two cross-reference IDs, or equivalents will be sent back to Agile, one to represent the master item and one to represent the formula. The format will be the same as described in the respective sections above.

For more information, see [Finished Good Syndication Process](#).

Solution Design Assumptions and Constraints

These are the assumptions and constraints for this PIP:

Design Assumptions

1. This integration solution has certain process aspects built into it based on best practices observed in the industry. For instance, it is assumed that Agile PLM for Process is the system of record for certain item attributes (such as Item Number, Description, Long Description, Revision, Category, and for packaging and printed packaging specifications such as Dimension UOM, and Weight UOM) for most customers of PLM.
2. All physical (or material) changes to items should be created as a new item in Agile PLM for Process instead of creating a new issue. This should be done to avoid the formulas in E-Business Suite to get invalidated.

3. Objects from either Agile PLM for Process or E-Business Suite system should not be physically deleted or purged, as this affects the cross-references in the Application Integration Architecture (AIA) layer.
4. The lower level BOM should be manually syndicated prior to the subsequent level BOM. For example, if the packaging item contains sub-components that are three levels deep, the third level BOM should be syndicated prior to the second level BOM.
5. End of Life (EOL) status should be handled through workflow. Agile PLM for Process sends a workflow notification (instead of automatic status update) to an Oracle Process Manufacturing (OPM) user when the specification has entered the appropriate stage. The OPM user should then take appropriate action based on the workflow notification.
6. Unit of Measure (UOM) and standard conversions should be defined manually in the Agile PLM for Process and E-Business Suite systems. Domain Value Mappings (DVMS) should also be set up.
7. Agile PLM for Process users should create custom validators to disallow item attribute changes that are not updateable in E-Business Suite. For example, if E-Business Suite does not allow changes to the name and if Agile PLM for Process user changes it, the item name could get out of sync.
8. The initial load of items and formula from Agile PLM for Process to Oracle Inventory and Oracle Process Manufacturing are offered as a consulting solution only.
9. The Agile PLM for Process's formula specification issue number and OPM's formula version number should not necessarily match. For example, issue number 2 in Agile PLM for Process may not correspond to OPM's version number 2. This is because OPM user could create a new version of the formula.
10. The integration uses a generic user ID and responsibility to create objects in E-Business Suite. This user should have all the necessary privileges to create and update objects in E-Business Suite.
11. This design leverages AIA error handling framework. The requester handles concurrency issues arising out of sending any input in an asynchronous way.

Design Constraints

1. Multi-Lingual Support (MLS) is considered out-of-scope for this integration.
2. Multi-Instance Support (one E-Business Suite to multiple Agile PLM or vice-versa) is not supported.

Solution Security Considerations

This PIP fully leverages the security infrastructure provided by the Oracle 11g service-oriented architecture (SOA) Suite, AIA Foundation Pack, and the underlying transport layer security features for Web Service security. The design of the solution is based on the following security assumptions:

- The BPEL service calls are well protected within the boundary of each application system.
- No user credentials need to be propagated across applications.

Using these considerations, the security design focuses on protecting the point-to-point service calls between application systems. On the PLM for Process side, you need to protect the Requester Application Business Connector Service (ABCS) hosted on the SOA Suite and the response listener Web service on the CSS.

As the first PIP implementation for PLM for Process, you need to choose to leverage the HTTP transport security features: HTTP Basic Authentication for authentication and SSL for encryption. HTTP Basic Authentication is widely used and less prone to have compatibility issues. It is also easy to configure and it satisfies the requirement for point-to-point authentication. SSL is used to encrypt the calls that might contain user credential and other sensitive business data.

For more information about security, see *Oracle® Fusion Middleware Developer's Guide for Oracle Application Integration Architecture Foundation Pack 11g Release 1, Working with Security*.

Agile PLM for Process Custom Validations

For the integration to work in any scenario, some business rules are provided as out-of-the-box custom validations in Agile PLM for Process. These validation rules should be configured in a validation configuration file. It is recommended that you do not overwrite the base validation configuration file, and instead extend it with a separate file.

The validation rules are:

- Ensure that the short name is not changed when a new issue of a formulation specification is created.
- Ensure that the short name is unique across all the specification numbers.
- The short name is mandatory.
- The short name is not longer than the configurable maximum length.

Oracle Application Integration Architecture Foundation Pack

Process Integration Packs connect participating applications using AIA Foundation Pack and Oracle Fusion Middleware components according to the AIA Foundation Pack development methodology.

For more information about the AIA Foundation Pack development methodology, see *Oracle Fusion Middleware Developer's Guide for Oracle Application Integration Architecture Foundation Pack*.

Chapter 2: Process Integration to Create and Syndicate Raw Materials

This chapter provides an overview of raw material creation and syndication and discusses:

- Raw Materials Syndication Process
- Process Flow of Raw Materials Syndication
- Solution Assumptions
- AIA Services for Raw Materials Syndication
- Integration Services for Raw Materials Syndication
- Essential DVMs for Raw Materials Syndication
- UOM Conversions

Overview

The Agile PLM for Process solution empowers you to track and reuse raw material specifications. It enables you to create raw materials such as ingredient, packaging, and printed packaging. Once the raw material is approved, it is then syndicated to Oracle E-Business Suite for further definition, procurement and planning.

Raw Materials Syndication Process

Raw material syndication sends ingredient, packaging, and printed packaging specifications to Oracle Inventory in E-Business Suite. These materials are used in formulation, trade, and packaging specifications as BOM items.

An ingredient specification enables the company to manage all attributes related to ingredients that it purchases for use in the BOM contained in the formulation specification. Packaging specifications contain the data related to the packaging materials used for packaging trade specifications. Printed packaging specifications describe the printed packaging to be used in trade specifications.

For specifications with a BOM, the integration first creates the item in Inventory Management and then creates the formula in OPM that represents the BOM. For example, a packaging specification that has a BOM is sent. Assuming that the BOM specifications already had been syndicated, the integration code creates the packaging item in E-Business Suite, and then the formula in OPM. The user only creates and sends one publication for that specification. In Agile PLM for Process, each specification type will have its own category hierarchy.

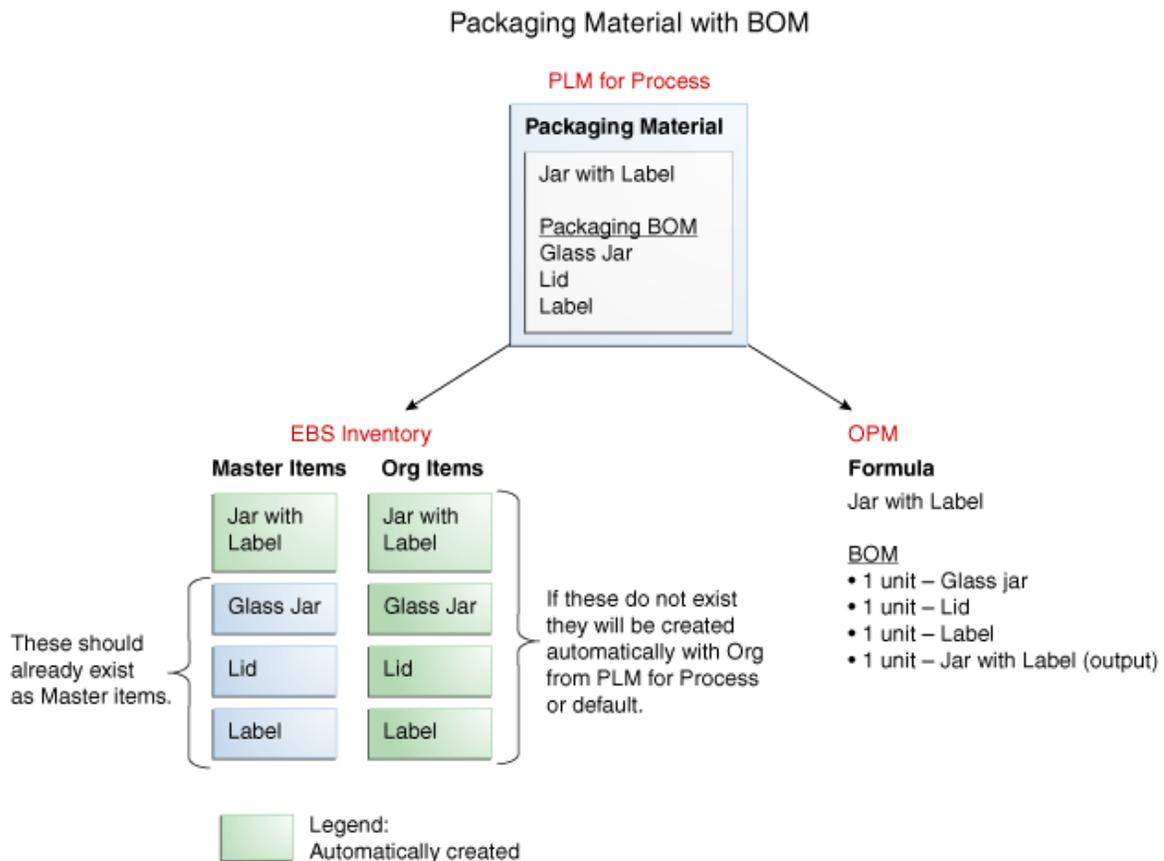
For more information about how a formula is syndicated, see [Recipe Syndication Process](#).

The attributes of an Item can be controlled at either organization or master level. If an attribute is controlled at the organization level, it can be modified only in that organization. The system does not overwrite the value of that attribute. However, if the attribute is controlled at the master level, then it can be modified only at the master level and the value is reflected across all the other organizations.

You can use the item template to create Items in E-Business Suite because Agile PLM for Process does not have enough information about its own to create an E-Business Suite item. For this PIP, Oracle Process Manufacturing (OPM) seeds a new item template called *@PLM for Process Items*.

Information regarding formula owner and organization should be either passed from Agile PLM for Process or defined as a default in the AIA configuration properties. OPM validates this information to ensure that the formulas are created successfully in respective organizations. For a multi-level BOM, OPM validates and ensures that lower-level BOMs are syndicated prior to syndicating higher-level BOMs.

This diagram illustrates an example of 'Jar with lid and label' as the packaging item mapped from Agile PLM for Process to OPM:



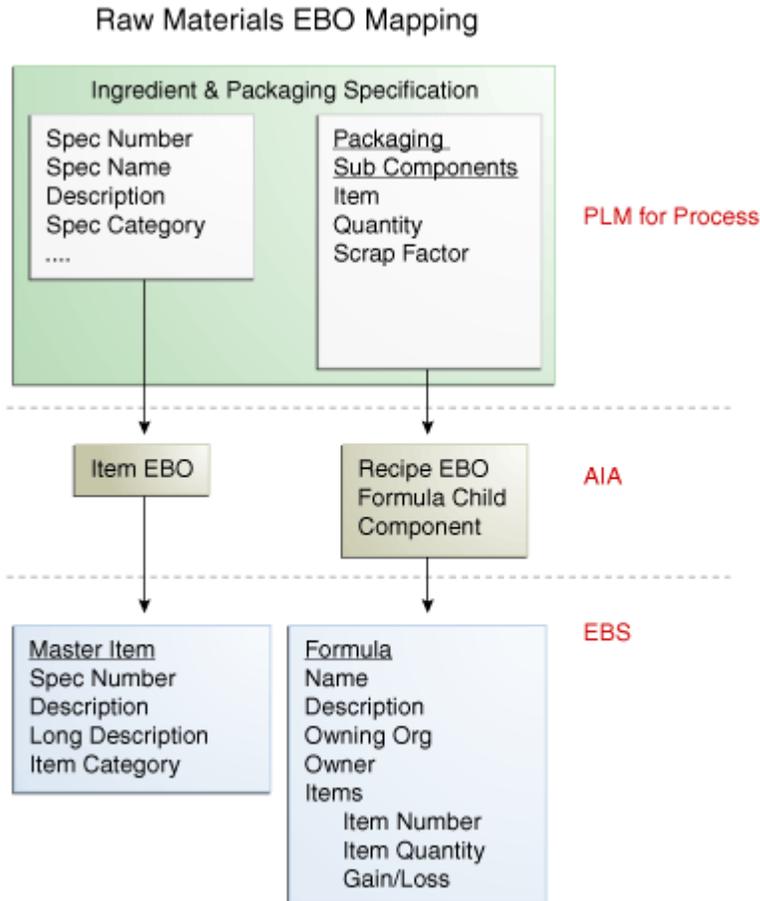
Mapping of packaging material with BOM specification from Agile PLM for Process to OPM

In OPM, a Formula is created. In Inventory Management, Items for both master and organization levels are created.

The integration process for a Packaging item with BOM specification (for example, Jar with lid and label) flows as follows:

1. The sub-components (Jar, Lid and Label) are created in Agile PLM for Process and then syndicated. As a result, master Items are created in E-Business Suite.
2. The main Packaging item (Jar with lid and label) is created with its BOM defined in Agile PLM for Process as a Packaging specification. The creation of Item and BOM in PLM is a part of the packaging specification and is performed as one transaction.
3. The owner and owning organization can be defined using the Extended Attribute feature. The Packaging item is syndicated as follows:
 - a. The master Item is created for 'Jar with lid and label'.
 - b. The organization Item is created for 'Jar with lid and label' (based on the owning organization information in the extended attribute).
 - c. The organization Items are created for the Jar, Lid, and Label each (based on the owning organization information in the extended attribute).
 - d. A Formula is created in OPM with 'Jar with lid and label' as the output (product) and Jar, Lid, and Label as the input (ingredient) BOM items.

The following flowchart illustrates the Enterprise Business Object (EBO) mapping for raw materials:



EBO mapping for raw materials

Ingredient and packaging specifications represent raw materials in Agile PLM for Process. These specifications syndicate to both the Item EBO and the formula component of the Recipe EBO. From the item EBO, a master Item in Oracle Inventory of E-Business Suite gets created. From the Recipe EBO, an OPM formula is created.

Process Flow of Raw Materials Syndication

Here are the steps describing the process flow of Raw Materials syndication:

1. Create an Item in Agile PLM for Process. For raw materials, an Item can be an Ingredient, Packaging, or Printed Packaging specification.
2. Use CSS to syndicate the newly created Item.
3. Agile PLM for Process invokes the Requester Application Business Connector Service (ABCS) and passes a payload of Item Application Business Messages (ABMs). This requester ABCS converts the Agile PLM for Process Item ABM to Item Enterprise Business Message (EBM).

4. The Item EBM is then passed as a payload to the Item EBS (Enterprise Business Service), which routes it to the provider ABCS of the Item for E-Business Suite.
5. The provider ABCS of the Item for E-Business Suite converts the Item EBM to E-Business Suite Item ABM and then invokes the E-Business Suite adapter service by passing this ABM as a payload.
6. The E-Business Suite adapter service responds with Response ABM along with a creation status. The E-Business Response ABM is converted to Item Response EBM.
7. The Item Response EBM is then passed back to the requester ABCS of Agile PLM for Process, which converts the message back to Agile PLM for Process -specific Item ABM and takes necessary actions such as updating cross-reference, status, and so on.
8. Items such as packaging and trade specifications have sub-components in a BOM structure. Hence, such items are sent as a separate Recipe EBM using the formula component.

For more information about how Recipe syndication occurs, see [Process Flow of Recipe Syndication](#).

Solution Assumptions

These are the assumptions:

- An item does not undergo physical (or material) changes from one issue to another. A new item should be created if the characteristic property has changed.
- A new issue of an ingredient does not create a new revision of the item in E-Business Suite. Item revision is not synonymous to versioning. Revision in Oracle Inventory is used for tracking inventory balances and revised items do not have their own copy of item attributes. In other words, items hold the same set of attributes regardless of the revisions.
- In Agile PLM for Process, every issue might contain changes in their attributes and these changes should not be captured in item revision within Oracle Inventory.
- As a good business practice, a syndicated Item should not undergo changes in subsequent issues.

AIA Services for Raw Material Syndication

The process integration for creating and syndicating raw materials uses the following industry components:

Enterprise Business Objects (EBO)	ItemEBO ProductionRecipeEBO
Enterprise Business Messages (EBM)	SyncItemListEBM SyncItemListResponseEBM

	SyncProductionRecipeListEBM SyncProductionRecipeListResponseEBM
Enterprise Business Services (EBS)	ItemEBSV2 ItemResponseEBSV2 ProductionRecipeEBS ProductionRecipeResponseEBS

Agile PLM for Process and Oracle E-Business Suite Components for Raw Material Syndication

The following table lists the Agile PLM for Process and Oracle E-Business Suite components involved in raw materials syndication:

Services	Agile PLM for Process (Requester)	Oracle E-Business Suite (Provider)
Adapters	SyncSpecPLM4PAdapter	SyncItemListEbizAdapter SyncRecipeListEbizAdapter
Application Business Connector Service (ABCS)	SyncSpecPLM4PReqABCImpl SyncProductionRecipeListPLM4PReqABCImpl	SyncItemListEbizProvABCImpl SyncProductionRecipeListEbizProvABCImpl
Application Business Messages (ABMs)	SyncItemListABM SyncItemListResponseABM SyncProductionRecipeListABM	APPS_INV_EBI_ITEM_PUB_PROCESS_ITEM_LIST APPS_GMD_EBI_RECIPE_PUB_SYNC_RECIPE

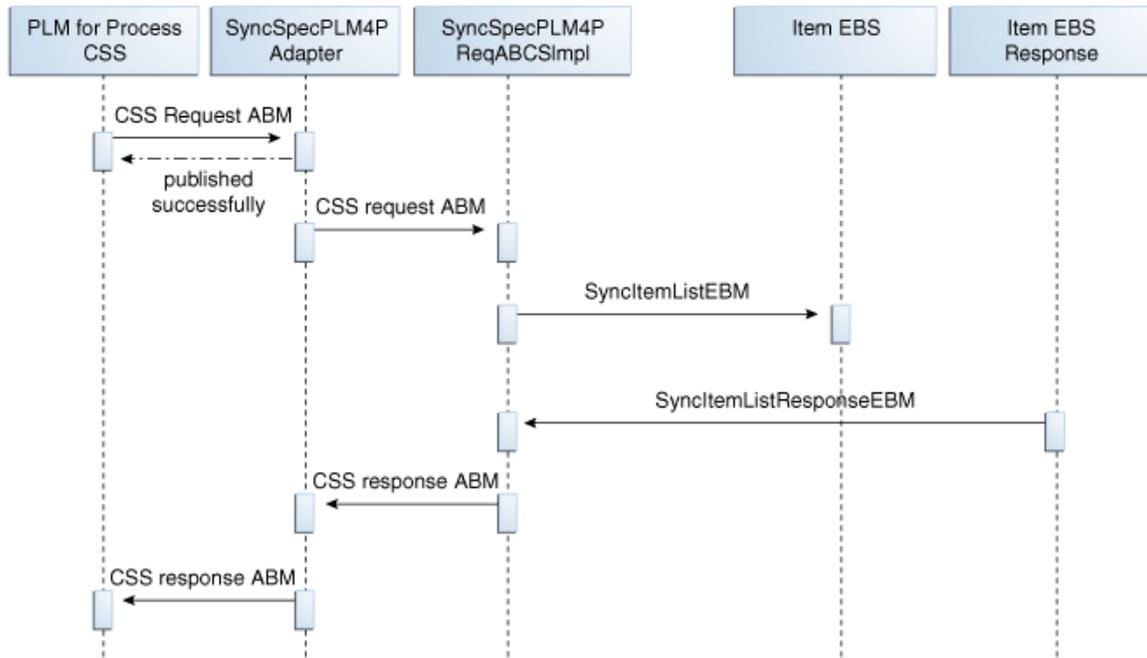
Integration Services for Raw Materials Syndication

As part of the integration flow, these services are delivered for raw materials syndication:

- [SyncSpecPLM4PAdapter](#)
- [SyncSpecPLM4PReqABCImpl](#)
- [ItemEBSV2](#)
- [ProductionRecipeEBS](#)
- [SyncItemListEbizProvABCImpl](#)
- [SyncProductionRecipeListEbizProvABCImpl](#)
- [ItemResponseEBSV2](#)
- [ProductionRecipeResponseEBS](#)
- [SyncItemListEbizAdapter](#)

- [SyncRecipeListEbizAdapter](#)

This sequence diagram illustrates the integration services used for raw materials syndication in Agile PLM for Process:

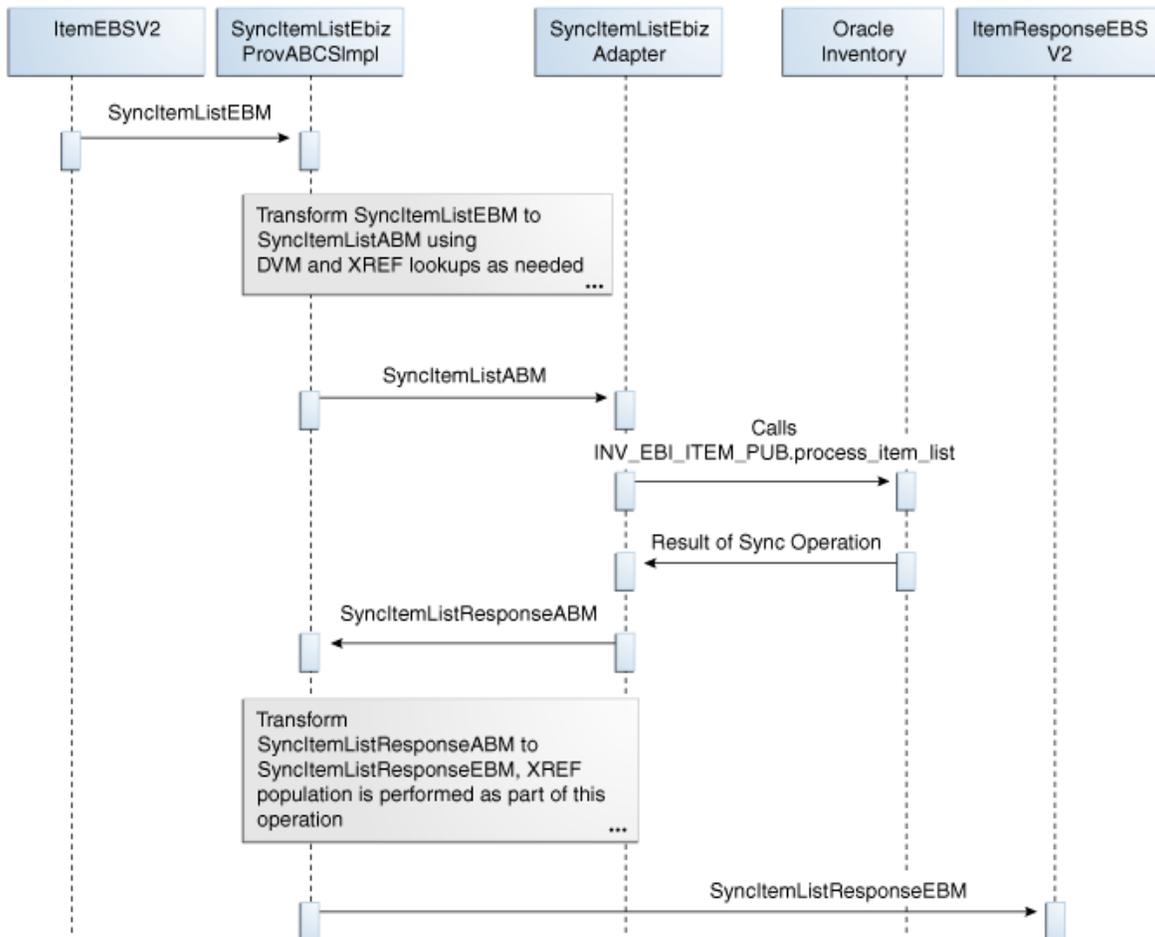


Integration services used for raw materials syndication in Agile PLM for Process

For more information about the integration services used for raw materials syndication in Agile PLM for Process, see the services mentioned in [Integration Services for Raw Materials Syndication](#).

For more information about the recipe syndication sequence in Agile PLM for Process, see [Integration Services used for recipe syndication in Agile PLM for Process](#) diagram.

This sequence diagram illustrates the integration services used for Raw Materials syndication in E-Business Suite:



Integration services used for raw materials syndication in E-Business Suite

For more information about the integration services used for Raw Materials syndication in E-Business Suite, see the services mentioned in [Integration Services for Raw Materials Syndication](#).

For more information about the Recipe syndication sequence diagram in E-Business Suite, see [Integration services used for recipe syndication in E-Business Suite](#) diagram.

SyncSpecPLM4PAdapter

SyncSpecPLM4PAdapter receives syndication messages from Agile PLM for Process and sends syndication responses to Agile PLM for Process.

Transformations

This table lists the Extensible Style Language (XSL) transformations of the *SyncSpecPLM4PAdapter* service:

XSLT Filename	Description
XFormFault_To_Reply.xsl	Transforms from syndication failed messages to CSS response messages
XForm_Reply.xsl	Replies to PLM4P CSS to identify the request has been received and workflow the TIP to "Pending" status
XFormCSSResponse_To_WSResponse.xsl	Transforms from SyncSpecPLM4PReqImpl reply messages to CSS response messages

Properties

This table lists the properties of the *SyncSpecPLM4PAdapter* service:

Property	Default Value / Setting	Description
ABCSExtension.PostProcessABM	True/False. Default=False	Determines whether to call the PostProcessABM user exit
ABCSExtension.PreProcessABM	True/False. Default=False	Determines whether to call the PreProcessABM user exit
AsyncResp.Soap.EndPointURL	http://\${participatingapplications.plm4p.host}:\${participatingapplications.plm4p.port}/\${participatingapplications.plm4p.path}/CSSServices.svc	Denotes the Agile PLM for Process syndication response handler Web service end point

SyncSpecPLM4PReqABCImpl

SyncSpecPLM4PReqABCImpl is used to synchronize the recipe, formula, and routing between Agile PLM for Process and Oracle E-Business Suite. In addition, it is used to synchronize raw material specifications, formula header data, and finished material specifications between Agile PLM for Process and Oracle E-Business Suite.

Note: The *SyncSpecPLM4PReqABCImpl* service handles both *SyncItemLEBMBM* and *SyncProductionRecipeLEBMBM*. Depending on the case, it is passed either to *SyncItemLEBMBizProvABCImpl* or *SyncProductionRecipeLEBMBizProvABCImpl*.

For an item, this service is used to transform the Agile PLM for Process Content Synchronization and Syndication (CSS) specification message into *SyncItemLEBMBM* to be subsequently passed to *SyncItemLEBMBizProvABC*. It provides an immediate (synchronous) status back to the CSS and provides the status updates and cross-reference updates asynchronously by calling the Agile PLM for Process Web service API.

The *SyncSpecPLM4PReqABCServiceImpl* service synchronizes recipe, formula, and routing by performing the following steps:

1. i) The Content Synchronization and Syndication (CSS) module in Agile PLM for Process invokes the *SyncSpecPLM4PAdapter* service, which stores the payload in a queue, invokes the *SyncSpecPLM4PReqABCServiceImpl* (Requester Application Business Connector Services), and passes a payload of Specification Application Business Message (ABM) that conforms to the standard Agile PLM for Process CSS specification XSD. The payload contains the data needed to create both Item and Recipe Enterprise Business Messages (EBMs) whenever applicable.
- ii) The *SyncSpecPLM4PAdapter* service sends an immediate 'pending' acknowledgement to Agile PLM for Process.

Note: Agile PLM for Process ensures that sub-components are created first and already exist as master items in E-Business Suite. CSS automatically creates TIPs for sub-components and external output ingredients (in the case of formulation specifications) if they do not exist when a TIP is added to the parent specification in Agile PLM for Process. Agile PLM for Process CSS uses a custom Transaction Generator to bundle and sends all sub-component items to the *SyncSpecPLM4PReqABCServiceImpl*.

2. The resulting ABM is split into Item and Recipe ABMs.
 - i) The Item EBM is created for specification types (including ingredient, printed packaging, packaging, or trade specification without sub-components) and mapped to the target system. Transformation of *SyncItemListABM* to *SyncItemListEBM* is done using these steps:
 - Look up DVMs to map the corresponding data.
 - Look up XREF if this is an update.
 - Map other attributes.

Note: *ItemEBSV2* routes to *SyncItemListEBizProvABCServiceImpl* and receives *SyncItemListResponseEBM* from *SyncItemListEBizProvABCServiceImpl*.

- ii) A Recipe EBM is created for packaging and trade specifications with sub-components, as well as for formulation specifications. Transformation of *SyncProductionRecipeListABM* to *SyncProductionRecipeListEBM* is done using these steps:
 - Look up DVMs to map the corresponding data.
 - Look up XREF if this is an update.
 - Map other attributes.

Note: *ProductionRecipeEBS* routes to *SyncProductionRecipeListEBizProvABCServiceImpl* and receives *SyncProductionRecipeListResponseEBM* from *SyncProductionRecipeListEBizProvABCServiceImpl*.

Both the Item and Recipe EBM are validated for any business rule violations by capturing the error messages for the response.

3. i) *SyncItemListResponseEBM* is transformed to *PLM4PSyncItemListResponseABM*. Verification of whether *PLM4PSyncItemListResponseABM* conforms to the Agile PLM for Process CSS Response XSD is performed. This XSD denotes the cross-reference identifier passed back from the Provider ABCS. If an error is propagated back, the Provider ABCS responds to Agile PLM for Process CSS Response handler Web service with *PLM4PSyncItemListResponseABM* and the recipe creation process is stopped.

ii) *SyncProductionRecipeListEbizProvABCSEImpl* responds with *SyncProductionRecipeListResponseEBM* along with a creation status and passes this information to the *SyncSpecPLM4PReqABCSEImpl*. *SyncProductionRecipeListResponseEBM* is transformed to *PLM4PSyncProductionRecipeListResponseABM* (conforming to Agile PLM for Process CSS Response XSD). If *PLM4PSyncProductionRecipeListResponseABM* exists from the earlier Item processing, it combines all the statuses and messages in one message.

SyncSpecPLM4PReqABCSEImpl performs the conversion from EBM to ABM but it invokes *SyncSpecPLM4PAdapter* to call the Agile PLM for Process CSS Response Web service for updating the TIP (Transactive Item Publications – a publication path used in Agile PLM for Process to determine syndication end points) with status, error messages, and item cross-reference data.

Transformations

This table lists the Extensible Style Language (XSL) transformations of the *SyncSpecPLM4PReqABCSEImpl* service:

XSLT Filename	Description
XFormPLM4PSyncItemListABM_To_SyncItemListEBM.xsl	Transforms PLM4PSyncItemListABM (the Agile PLM for Process CSS message) to SyncItemListEBM
XFormPLM4PSyncItemListABM_To_SyncItemListEBM_Custom.xsl	Supports custom transformation of PLM4PSyncItemListABM to SyncItemListEBM
XFormPLM4PSyncProductionRecipeListABM_To_SyncProductionRecipeListEBM.xsl	Transforms PLM4PSyncRecipeListABM (the Agile PLM for Process CSS message) to SyncProductionRecipeListEBM
XFormPLM4PSyncProductionRecipeListABM_To_SyncProductionRecipeListEBM_Custom.xsl	Supports custom transformation of PLM4PSyncRecipeListABM to SyncProductionRecipeListEBM
XSyncItemListEBM_to_AIAFaultMsg.xsl	Transforms the syndication Error EBM to AIAAsyncErrorHandlerBPELProcess message
XformSyncItemListResponseEBM_To_PLM4PSyncItemListResponseABM.xsl	Transforms SyncItemListResponseEBM to PLM4PSyncItemListResponseABM (the Agile PLM for Process CSS Response message)
XformSyncItemListResponseEBM_To_PLM4PSyncItemListResponseABM_Custom.xsl	Supports custom transformation of SyncItemListResponseEBM to PLM4PSyncItemListResponseABM

XSLT Filename	Description
XFormSyncProductionRecipeListEBM_Second.xsl	Supplements the transformation from PLM4P message to ProductionRecipeList EBM
XformSyncProductionRecipeListResponseEBM_To_PLM4 PSyncProductionRecipeListResponseABM.xsl	Transforms SyncProductionRecipeListResponseEBM to PLM4PSyncRecipeListResponseABM (the Agile PLM for Process CSS Response message)
XformSyncProductionRecipeListResponseEBM_To_PLM4 PSyncProductionRecipeListResponseABM_Custom.xsl	Supports custom transformation of SyncProductionRecipeListResponseEBM to PLM4PSyncRecipeListResponse
XSyncItemEBM_to_AIAFaultMsg.xsl	Transforms the syndication Error EBM to AIAAsyncErrorHandlingBPELProcess message

Properties

This table lists the properties of the *SyncSpecPLM4PReqABCImpl* service:

Property	Default Value / Setting	Description
ABCSExtension.PostProcessEBM	True/False. Default=False	Determines whether to call the PostProcessEBM user exit
ABCSExtension.PreProcessEBM	True/False. Default=False	Determines whether to call the PreProcessEBM user exit
CUSTOM.TRANSFORMATIONS.AB M_TO_EBM	True/False. Default=False	Determines whether to call the custom transformation of ABM to EBM
CUSTOM.TRANSFORMATIONS.EB M_TO_AB	True/False. Default=False	Determines whether to call the custom transformation of EBM to ABM
Default.SystemID	PLM4P_01	The application sends the System ID from which the request is sent. If any requester application fails to send this request, AIA picks the default System ID from this configuration property.
INVENTORY.XREF.SYSTEM.ID	INV-EBIZ_01	Determines the PLM for Process cross-reference system ID for Oracle E-Business Suite's Inventory Management
Item_EBS.Soap.EndpointURL	http://{fp.server.soaserverhostname}:{fp.server.soaserverport}/soa- infra/services/default/ItemEBSV2/ ItemEBSV2_ep	Sets the Item EBS end point of the Item Syndication flow
OPM.XREF.SYSTEM.ID	OPM-EBIZ_01	Determines the PLM for Process cross-reference system ID for Oracle E-Business Suite's Oracle Process Manufacturing

Property	Default Value / Setting	Description
Recipe_EBS.Soap.EndpointURL	http://\${fp.server.soaserverhostname}:\${fp.server.soaserverport}/soa-infra/services/default/ProductionRecipeEBS/ProductionRecipeEBS_ep	Sets the Production Recipe EBS end point of the Recipe Syndication flow
Routing.ItemEBSV2.SyncItemList.CAVS.EndpointURI	http://\${fp.server.soaserverhostname}:\${fp.server.soaserverport}/AIValidationSystemServlet/asyncrepsonserecipient	Sets the CAVS end point of the Item Syndication flow
Routing.ItemEBSV2.SyncItemList.MessageProcessingInstruction.EnvironmentCode	PRODUCTION/TEST. Default=PRODUCTION	Sets the Environment code for Item Syndication
Routing.ItemEBSV2.SyncItemList.RouteToCAVS	True/False. Default = False	Determines whether the request is to be sent to the CAVS simulator
Routing.ProductionRecipe.SyncProductionRecipeList.CAVS.EndpointURI	http://\${fp.server.soaserverhostname}:\${fp.server.soaserverport}/AIValidationSystemServlet/asyncrepsonserecipient	Sets the CAVS end point of the Recipe Syndication flow.
Routing.ProductionRecipe.SyncProductionRecipeList.MessageProcessingInstruction.EnvironmentCode	PRODUCTION/TEST. Default=PRODUCTION	Sets the Environment code for Recipe Syndication
Routing.ProductionRecipe.SyncProductionRecipeList.RouteToCAVS	True/False. Default = False	Determines whether the request is to be sent to the CAVS simulator
TRACE.LOG.ENABLED	True/False. Default = False	Determines whether to use AIA trace log for the flow
Trade.Spec.Default.UOM	UN	Sets the Trade specification default base Unit of Measure.

ItemEBSV2

ItemEBSV2 is the Enterprise Business Service (EBS) mediator in 11g that exposes the operations related to the item integration on the Item EBO based on the following routing rule:

- *SyncItemList*: Routes *SyncItemListEBM* to *SyncItemListEbizProvABCImpl*.

ProductionRecipeEBS

ProductionRecipeEBS is the Enterprise Business Service (EBS) mediator in 11g that exposes the operations related to the recipe integration on the Recipe EBO based on the following routing rule:

- *SyncProductionRecipeList*: Routes *SyncProductionRecipeListEBM* to *SyncProductionRecipeListEbizProvABCImpl*.

SyncItemListEbizProvABCImpl

SyncItemListEbizProvABCImpl is used to synchronize Items to Oracle Inventory. It calls the Sync Item API to create or update the Item in E-Business Suite and populates the XREF tables accordingly.

The *SyncItemListEbizProvABCImpl* service synchronizes BOM items by performing the following steps:

1. Receives *SyncItemListEBM* from *ItemEBSV2*.
2. Transforms *SyncItemListEBM* into Oracle E-Business Suite specific message *SyncItemListABM*.
 - Look up DVMs to map the corresponding data.
 - Look up XREF if this is an update.
 - Map other corresponding columns.
3. Sets the Apps Context with the obtained User and Responsibility.

The User and Responsibility is obtained as follows:

The EBM header contains a language code attribute, which needs to be populated by the requester ABCS. Based on the value here, the LANGUAGE_CODE DVM is located to get the equivalent EBS Language Code. Using this language code, the User defined in the DVM EBIZ_PLM4P_APPS_USER is utilized. For example, if the Language Code in the EBM header is KOREAN, then KO is obtained from the LANGUAGE_CODE DVM for the EBS column. You need to define the LANG_CODE and USER_NAME values in the EBIZ_PLM4P_APPS_USER DVM. If two languages are supported, LANG_CODE has US and KO and USER_NAME (for this example) that contains customer-created users for these languages such as EBIZ_US_USER and EBIZ_KO_USER. Therefore, in this example, the User EBIZ_KO_USER is utilized to set the apps context. The responsibility is defined in the property RESPONSIBILITY in the AIAConfigurationProperties at the E-Business Suite Module level for this ABCS.

4. Invokes the *SyncItemListEbizAdapter* with *SyncItemListABM*.
5. Populates the XREF of the Item for a create operation, if the synchronization operation is successful.
6. Sends error message from the API and faults the instance, in case of a mapping error.
7. Transforms Oracle E-Business Suite specific message *SyncItemListResponseABM* into *SyncItemListResponseEBM*.
8. Calls *ItemResponseEBSV2* service to send response message *SyncItemListResponseEBM* to *SyncSpecPLM4PReqABCImpl*.

Transformations

This table lists the transformations of the *SyncltemListEbizProvABCImpl* service:

XSLT Filename	Description
AddTargetSystemID.xsl	Assigns the Target System ID to EBM header
EBM_To_Fault.xsl	Transforms the EBM header to fault message
Fault_to_SyncltemListResponseEBM.xsl	Assigns the fault message to Response EBM
XformSyncltemListEBMtoEbizProdABM_Custom.xsl	Supports custom transformation of SyncltemListEBM to SyncltemListABM
XformSyncltemListEBMtoEbizProdABM.xsl	Transforms SyncltemListEBM to SyncltemListABM
XformEbizProdABMtoSyncltemListResponseEBM_Custom.xsl	Supports custom transformation of SyncltemListResponseABM to SyncltemListResponseEBM
XformEbizProdABMtoSyncltemListResponseEBM.xsl	Transforms SyncltemListResponseABM to SyncltemListResponseEBM and updates the xref entries

Properties

This table lists the properties of the *SyncltemListEbizProvABCImpl* service:

Property	Value / Settings	Description
ABCSExtension.PostInvokeSyncltemListABM	True/False. Default=false	Determines whether to call the PostProcessABM user exit.
ABCSExtension.PostXformABMtoEBMEBM	True/False. Default=false	Determines whether to call the PostProcessEBM user exit.
ABCSExtension.PreInvokeSyncltemListABM	True/False. Default=false	Determines whether to call the PreProcessABM user exit.
ABCSExtension.PreXformEBMtoABMEBM	True/False. Default=false	Determines whether to call the PreProcessEBM user exit.
ASSIGN_DEFAULT_TEMPLATE_FROM_ICC	True/False. Default=False	If this property is set to 'T' and user does not pass a template, then the default template attached to Item Catalog Category (ICC) will be applied to the item. If it is set to 'F', the default template attached to ICC will not be considered.
DEFAULT.CATEGORYSET.NAME	Null	Denotes the default category set name that is used to attach the items to appropriate item categories. This category set is used only if category set information is not sent across from Agile PLM for Process.
DEFAULT.MASTER.ORG.CODE	Null	Denotes the default master organization

Property	Value / Settings	Description
		ID where items are created. If no organization information is sent, this default master organization ID is passed into the sync Item API and the Item is created in this master organization.
Default.SystemID	EBIZ_01	The application sends the SystemID from which the request is sent. If any requester application fails to send this request, AIA picks the default SystemID from this configuration property.
DEFAULT.TEMPLATE.NAME	Null	Denotes the default template used to create an item.
Routing.ItemResponseEBSV2.SyncItemResponse.CAVS.EndpointURI	http://{fp.server.soaserverhostname}:{fp.server.soaserverport}/AIAValidationSystemServlet/asyncresponserecipient	Sets the CAVS endpoint of the Item Response EBS.
Routing.ItemResponseEBSV2.SyncItemResponse.MessageProcessingInstruction.EnvironmentCode	PRODUCTION/TEST. Default=PRODUCTION	Sets the Environment code for Item Response EBS.
Routing.ItemResponseEBSV2.SyncItemResponse.RouteToCAVS	True/False. Default=False	Denotes the Composite Application Validation System (CAVS) service name of the Item Response EBS.
Routing.SyncItemListEbizAdapter.CAVS.EndpointURI	http://{fp.server.soaserverhostname}:{fp.server.soaserverport}/AIAValidationSystemServlet/asyncresponserecipient	Sets the CAVS endpoint of the Item E-Business Suite Adapter.
Routing.SyncItemListEbizAdapter.EBIZ_01.EndpointURI	http://{fp.server.soaserverhostname}:{fp.server.soaserverport}/soa-infra/services/default/SyncItemListEbizAdapter/SyncItemListEbizAdapter_endpoint	Sets the endpoint of the SyncItemListEbizAdapter
Routing.SyncItemListEbizAdapter.RouteToCAVS	True/False. Default=false	Determines whether the request is to be sent to the CAVS simulator or the E-Business Suite Adapter.
TEMPLATE_FOR_ITEM_UPDATE_ALLOWED	True/False. Default=false	Controls the template being applied for updating an item. If the value is set to false, the template is not used for the update.
TRACE.LOG.ENABLED	True/False	In case the instance rolls back, the messages are logged if the property is set to True.

Module Level Properties

This table lists the module-level properties of the *SyncItemListEbizProvABCServiceImpl* service:

Property	Value / Settings	Description
EBIZ_01.SERVER_TIMEZONE	GMT-08:00	The time zone sent in the EBM payload for the DateTime fields is converted to the time zone mentioned in this property.
RESPONSIBILITY	OPM All	Denotes the E-Business Suite responsibility used to set apps context.
USER	<code>\${participatingapplications.ebiz.server.username}</code>	This is the default user used to set the apps context if no user is returned from the EBIZ_PLM4P_APPS_USER.dvm when looked upon the Language code.

Web Services Description Language (WSDL)

This table lists the WSDL details of the *SyncItemListEbizProvABCServiceImpl* service:

WSDL	Description
WSDL Binding	SyncItemListEbizProvABCServiceImplServiceBinding
WSDL Message	SyncItemListReqMsg Element: SyncItemListEBM SyncItemListResMsg Element: SyncItemListResponseEBM
WSDL Name	SyncItemListEbizProvABCServiceImpl.wsdl
WSDL Port Type	SyncItemListEbizProvABCServiceImplService
WSDL Port Type Operations	SyncItemList
WSDL Service	SyncItemListEbizProvABCServiceImplService

XML Schema Definition (XSD)

This table lists the XSD details of the *SyncItemListEbizProvABCServiceImpl* service:

XSD Filename	Description
APPS_INV_EBI_ITEM_PUB_PROCESS_ITEM_LIST.xsd	Contains the SyncItem Request and Response ABM.

SyncProductionRecipeListEbizProvABCServiceImpl

SyncProductionRecipeListEbizProvABCServiceImpl is used to synchronize the recipe, formula, and routing in Oracle E-Business Suite. It calls the Sync Recipe API to create or update the recipe, formula, and routing in E-Business Suite and populates the XREF tables accordingly.

The *SyncProductionRecipeListEbizProvABCSEmpl* service synchronizes recipe, formula, and routing by performing the following steps:

1. Receives the SyncProductionRecipeListEBM from the ProductionRecipeEBS.
2. Transforms the SyncProductionRecipeListEBM to the SyncProductionRecipeListABM.
 - a. Look up DVMs to map the corresponding data.
 - b. Look up XREF if it is an update case.
 - c. Map all the other corresponding columns.
3. Specifies the Apps Context with the obtained User and Responsibility. To obtain the User and Responsibility, see the third step of [SyncItemLEbizProvABCSEmpl](#) service. In this case, the responsibility is defined in the property RESPONSIBILITY in the AIAConfigurationProperties at the Service level for the ABCS.
4. Invokes the SyncRecipeListEbizAdapter with the SyncProductionRecipeListABM.
5. Populates the XREF of the Item for a create operation, if the synchronization operation is successful.
6. Sends the error message from the API and faults the instance, in case of a mapping error.
7. Transforms Oracle E-Business Suite specific message SyncProductionRecipeListResponseABM into SyncProductionRecipeListResponseEBM.
8. Calls ProductionRecipeResponseEBS service to send response message SyncProductionRecipeListResponseEBM to SyncSpecPLM4PReqABCSEmpl.

Transformations

This table lists the transformation details of the *SyncProductionRecipeListEbizProvABCSEmpl* service:

XSLT Filename	Description
AddTargetSystemID.xsl	Assigns the Target System ID to EBM header
EBM_To_Fault.xsl	Transforms the EBM Header to Fault message
PISqlFault_To_EBMFault.xsl	Assigns PL/SQL error message to fault message
SetAppsContext.xsl	Initializes the apps context header
Xform_Fault_EBM.xsl	Assigns the fault message to Response EBM
XformSyncProductionRecipeResponseABM_To_SyncProductionRecipeResponseEBM_Custom.xsl	Supports custom transformation of SyncProductionRecipeResponseABM to SyncProductionRecipeResponseEBM
XformSyncProductionRecipeResponseABM_To_SyncProductionRecipeResponseEBM.xsl	Transforms SyncProductionRecipeResponseABM to SyncProductionRecipeResponseEBM and update the xref entries.

XSLT Filename	Description
XFormSyncProductionRecipeEBM_To_SyncProductionRecipeABM_Custom.xsl	Supports custom transformation of SyncProductionRecipeEBM to SyncProductionRecipeABM
XFormSyncProductionRecipeEBM_To_SyncProductionRecipeABM.xsl	Transforms SyncProductionRecipeEBM to SyncProductionRecipeABM

Properties

This table lists the properties of the *SyncProductionRecipeListEbizProvABCImpl* service:

Property	Value / Settings	Description
ABCSExtension.PostProcessABM	True/False. Default=false	Determines whether to call the PostProcessABM user exit.
ABCSExtension.PostProcessEBM	True/False. Default=false	Determines whether to call the PostProcessEBM user exit.
ABCSExtension.PreProcessABM	True/False. Default=false	Determines whether to call the PreProcessABM user exit.
ABCSExtension.PreProcessEBM	True/False. Default=false	Determines whether to call the PreProcessEBM user exit.
CREATEROUTING.AS.ATTACHMENT	Yes/No. Default=Yes	If this is Yes, then routing is created as an attachment and set against the formula. If this is No, no attachment is created.
CUSTOM.TRANSFORMATIONS.ABM_TO_EBM	True/False. Default=false	Determines whether to call the custom transformation of ABM to EBM.
CUSTOM.TRANSFORMATIONS.EBM_TO_ABM	True/False. Default=false	Determines whether to call the custom transformation of EBM to ABM.
DEFAULT.FORMULA.OWNING.ORG.CODE	Null	If the organization field is null, you need to use this organization to assign items to the organization and create the recipe or formula in this organization.
DEFAULT.FORMULA.OWNING.OWNER.NAME	Null	Denotes an E-Business Suite FND user. It can be different from the E-Business Suite integration user used to create the formula. If the formula owner is null, then this user is defaulted.
Default.SystemID	EBIZ_01	The application sends the SystemID from which the request is sent. If any requester application fails to send this request, AIA picks the default SystemID from this configuration property.
RESPONSIBILITY	OPM All	Denotes the E-Business Suite responsibility

Property	Value / Settings	Description
		used to set apps context.
Routing.ProductionRecipeResponseEB SV1.SyncProductionRecipeListResponse.MessageProcessingInstruction.EnvironmentCode	PRODUCTION/TEST. Default=PRODUCTION	Sets the Environment code for Item Response EBS.
Routing.SyncRecipeListEbizAdapter.CAVS.EndpointURI	http://\${fp.server.soaserverhostname}:\${fp.server.soaserverport}/AIAValidationSystemServlet/syncresponsesimulator	Sets the CAVS end point of the Recipe E-Business Suite Adapter.
Routing.SyncRecipeListEbizAdapter.EBIZ_01.EndpointURI	\${fp.server.soaserverhostname}:\${fp.server.soaserverport}/soa-infra/services/default/SyncRecipeListEbizAdapter/SyncRecipeListEbizAdapterService	Sets the end point of the Recipe E-Business Suite Adapter.
Routing.SyncRecipeListEbizAdapter.RouteToCAVS	True/False. Default=false	Determines whether the request is to be sent to the CAVS simulator or the E-Business Suite Adapter.
TRACE.LOG.ENABLED	True/False. Default=False	Use AIA trace log for the flow.
ZERO_ING_ALLOWED	Yes/No. Default=Yes	Determines whether the quantity of the ingredient can be zero or not.

Module Level Properties

This table lists the module level properties of the *SyncProductionRecipeListEbizProvABCServiceImpl* service:

Property	Value / Settings	Description
User	\${participatingapplications.ebiz.server.username}	The default user used while setting the AppsContext if no user is available when looked upon the Language code

Web Services Description Language (WSDL)

This table lists the WSDL details of the *SyncProductionRecipeListEbizProvABCServiceImpl* service:

WSDL	Description
WSDL Binding	SyncProductionRecipeListEbizProvABCServiceImplBinding
WSDL Message	SyncProductionRecipeListEbizProvABCServiceImplRequestMessage Element: SyncProductionRecipeListEBM SyncProductionRecipeListEbizProvABCServiceImplRespMsg Element: SyncProductionRecipeListResponseEBM
WSDL Name	SyncProductionRecipeListEbizProvABCServiceImpl.wsdl

WSDL	Description
WSDL Port Type	SyncProductionRecipeListEbizProvABCImpl
WSDL Service	Syncproductionrecipelistebizprovabcsimpl_client_ep

XML Schema Definition (XSD)

This table lists the XSD details of the *SyncProductionRecipeListEbizProvABCImpl* service:

XSD Filename	Description
APPS_GMD_EBI_RECIPES_PUB_SYNC_RECIPES.xsd	Contains the SyncProductionRecipe Request and Response ABM.

ItemResponseEBSV2

ItemResponseEBSV2 is the Enterprise Business Service (EBS) mediator in 11g that exposes the operations related to the item integration on the Item EBO based on the following routing rule:

- *SyncItemListResponse*: Routes *SyncItemListResponseEBM* to *SyncSpecPLM4PReqABCImpl*.

ProductionRecipeResponseEBS

ProductionRecipeEBS is the Enterprise Business Service (EBS) mediator in 11g that exposes the operations related to the recipe integration on the Recipe EBO based on the following routing rule:

- *SyncProductionRecipeListResponse*: Routes *SyncProductionRecipeListResponseEBM* to *SyncProductionRecipeListPLM4PReqABCImpl*.

SyncItemListEbizAdapter

SyncItemListEbizAdapter is used to call the sync Item API to create or update items in Oracle Inventory of E-Business Suite.

SyncRecipeListEbizAdapter

SyncRecipeListEbizAdapter is used to call the Sync Recipe API to create or update recipe and formula in Oracle Process Manufacturing (OPM) of E-Business Suite.

Essential DVMs for Raw Materials Syndication

For more information about the DVMs that should be set for raw materials syndication process to flow successfully, see [Item DVMs in Agile PLM for Process](#) and [Item DVMs in E-Business Suite](#).

UOM Conversions

The unit of measure (UOM) enables you to count how much of an item or how many counts of an item is involved in a transaction or stored in an inventory. UOMs express the quantity of items and are not organization-specific. UOM needs to be associated with a numerical value to define the quantity. The base (or primary) UOM is an item attribute that you specify when defining each item. For example, when we say we have 5 pens in a box, we imply that there are 5 individual units of pens in that box. This is also denoted as 5 each pens in the box, where 'each' and 'box' are the UOMs.

UOMs used for a given material are described on the material based on ingredient, packaging, printed packaging, or trade specification. When raw materials are added to a BOM in a formulation, trade, or packaging specification, the specification can only be defined in UOMs that have been defined for that specification. For example, an ingredient (Sugar) is set up in Agile PLM for Process with the following UOM data:

Base UOM: LB; Additional UOM: KG, G; and UOM Conversion: 1 BG = 5 LB

When a formulation specification uses Sugar in the BOM, it is only defined in LB, KG, G, or BG UOMs. In other words, UOM conversions between KG-LB and G-LB are implicit whereas BG is the user-defined UOM for bag. Hence, UOM conversion has to be defined between BG and LB.

In Agile PLM for Process, you can set up ingredient, packaging, and printed packaging specifications with the available UOM information. The UOM information for trade specifications is created based on the net weight. Recipes do not have UOM conversion information but they use the conversion information from the raw materials.

Note: Updation of UOM conversions is not supported as it could have an adverse impact on existing transactions in Oracle E-Business Suite.

UOM conversions are not organization-specific and represent numerical factors that enable you to perform transactions in units other than the primary unit of the item being transacted. You can define a conversion, if it is:

- Common to any item (Standard)
- For a specific item within a UOM class (Intra-class)
- For a specific item between UOM classes (Inter-class)

Note: You must define a conversion between a non-base UOM and the base UOM before you can allocate the non-base UOM to an item.

When you define an item, decide which type of UOM conversion to use:

- **Item specific:** Only uses UOM conversions unique to this item. If none exist, you can only transact this item in its base UOM.
- **Standard:** Uses standard UOM conversions for this item, if an item-specific conversion is not available. To define a standard conversion for any item, enter a UOM. Enter the conversion factor by which the unit of measure is equivalent to the base UOM established for this class. For example, if one Dz (UOM) is equivalent to 12 Ea (base unit), the conversion factor is 12.

Alternatively, if Ea is equal to one-twelfth of a Dz, the conversion factor is 0.08333.

- **Both:** Uses both item-specific and standard unit of measure conversions. If both exist for the same unit of measure and item combination, the item-specific conversion is used.

Defining UOM Classes in Oracle E-Business Suite

Before you define UOMs, UOM classes in Oracle E-Business Suite need to be defined. A UOM has to be assigned to a UOM class. UOM classes represent groups of UOMs with similar characteristics or that measure the same dimension. Each unit of measure you define must belong to a unit of measure class. For example, Length is a UOM class that might contain UOMs such as Centimeter, Meter, Kilometer, Inch, Foot, and Mile.

When a UOM class is defined, the first UOM that is created under that class is called the Base UOM. Every UOM defined subsequently under that UOM class has to have a conversion defined per unit of the base UOM. For example, 1 Cubic Millimeter = 0.0000003571 Cubic foot.

Each class has a base UOM that is used to perform conversions between UOMs in the class. Hence, the base UOM represents the other UOM in the class, and generally denotes one of the smaller units. For example, you could use CU (cubic feet) as the base unit of a class called Volume. So, Cubic Millimeter becomes a member of the Volume UOM class for the previous example. UOM classes are not organization-specific and their default values are not provided.

Creating UOM Conversions

The conversions between the primary (or base) and secondary UOMs are passed as UOM conversions. If you set the secondary UOM extended attribute, but did not provide a conversion, Agile PLM for Process still sends the secondary UOM.

Note: UOMs are not synchronized through the PIP, but a mapping is maintained between Agile PLM for Process and Oracle E-Business Suite UOMs through a UOM DVM.

Necessary validations in E-Business Suite ensure that pre-defined conversions exist between primary and secondary UOMs. Otherwise, an error is generated.

Note: When tracking quantity indicator is set as 'PS,' that is, if an item is tracked through both primary and secondary UOM codes, then the secondary default indicator should be set using the item template. The customer sets this default value by customizing the seeded template '@PLM for Process Items'.

If the item that is being syndicated has UOM that does not exist in E-Business Suite, the process will halt. As a prerequisite, UOMs from both systems should be manually maintained along with the Domain Value Mappings (DVMs). In Agile PLM for Process, the UOM is at the specification level and a conversion is defined for that UOM. For example, specification UOM is 'Bag' and conversion '10 Lbs = 1 Bag.' If 'Bag' is not defined as a UOM in E-Business Suite, it should be manually defined with an appropriate class along with its conversion to the base UOM.

Note: Agile PLM for Process allows you to create a new UOM only under a specific class called 'Other' and all these new UOMs do not have any standard conversion factor.

This section describes how UOM conversions are created and updated in Oracle Inventory when raw materials are syndicated from Agile PLM for Process. These conversions are later used in OPM during formula creation. To create UOM conversions in E-Business Suite, the syndication process internally performs the following steps:

- Gets or creates conversion from the item's base UOM to its class's base UOM.
- Gets or creates [inter-class conversion](#), if applicable.
- Validates or creates [intra-class conversion](#) to the class's base UOM.

Note: The item-specific conversion defined by an Agile PLM for Process user is converted to item-specific conversions (intra-class and inter-class) in E-Business Suite as a part of the item syndication.

To get or create conversion from the item's base UOM to its class's base UOM:

1. Using DVM, the base UOM of Agile PLM for Process is mapped to the base UOM of E-Business Suite by performing the following steps:
 - a. Identify the base UOM of Agile PLM for Process UOM.
 - b. Identify the base UOM of the E-Business Suite UOM.
 - c. Calculate the conversion factor between the base UOMs of Agile PLM for Process and Oracle E-Business Suite.
2. Verification of whether the base UOMs of Agile PLM for Process and Oracle E-Business Suite are same is performed.
3. If these base UOMs are same, the conversion factor is set to 1 and the steps related to creating the [intra-class UOM conversions](#) are performed.
4. If the base UOMs of Agile PLM for Process and Oracle E-Business Suite are different, the syndication process verifies whether a conversion (either standard or item-specific) is already defined between them. If a conversion already exists, the steps related to creating the [inter-class UOM conversions](#) are performed.
5. If a conversion does not exist, the list of all UOMs of the source class that has standard conversions defined to its base UOM are obtained and stored as a list. For example, the conversions of 'Ea' for base UOM 'Dz' are obtained and then stored as the conversion rate $CR_{Dz-Ea} = 12$.
6. The conversion rate provided to the item by Agile PLM for Process for any one of the UOM in this list is obtained.

7. If a matching UOM does not exist in the list, the conversion factor is set to 1, the Create conversion API for the specific item is called, and the steps related to creating the [inter-class UOM conversions](#) are performed.
8. If one matching UOM is found in the list (for example, 1 Dz = 1 Bag), this UOM is used and the conversion (for example, between 'Bag' and 'Ea' where 1 Bag = 12 Ea or $CR_{Bag-Ea}=12$) is created. Next, the appropriate APIs are called for creating an item-specific conversion and the steps related to creating the [inter-class UOM conversions](#) are performed.

Let us suppose that Agile PLM for Process sends a UOM conversion from U' (Lbs) to U (Bag) where 10 Lbs = 1 Bag. In this case, the UOM conversion factor, represented as $CR_{U'-U}$ (in this case, $CR_{Lbs-Bag}$) will be 0.1 since 1 Lb = 0.1 Bag. In Agile PLM for Process, 'Bag' is the base UOM.

Creating Inter-Class UOM Conversions

An inter-class conversion is defined when an item-specific conversion has to be defined between the base UOMs of two different UOM classes. For example, a conversion between 'pounds' and 'gallons' would require an inter-class conversion because 'pound' (source base unit) belongs to the UOM class of 'mass' and 'gallon' (destination base unit) belongs to the UOM class of 'volume.' This conversion is item specific because it is based on the item 'Density.'

The following table illustrates how inter-Class UOM conversions are created based on the values used in the preceding table:

Source Base Unit	Class of Source Base Unit	Conversion Rate	Destination Base Unit	Class of Destination Base Unit	Mathematical Relationship	Formula
Bag	Count	12	Ea	Count	CR_{Bag-Ea} or $CR_{MU'-BU}$	Given 1 Bag = 12 Ea
Lbs	Quantity	0.1	Bag	Count	$CR_{Lbs-Bag}$ or $CR_{MU'-U}$	Given 1 Lb = 0.1 Bag
Lbs	Quantity	0.454	Kg	Quantity	CR_{Lbs-Kg} or $CR_{MU'-BU'}$	$(CR_{Lbs-Bag} \times CR_{Bag-Ea}) / CR_{Kg-Ea} = (0.1 \times 12) / 2.643 = 0.454$
Ea	Count	0.083	Bag	Count	CR_{Ea-Bag} or $CR_{BU'-U}$	Given 1 Bag = 12 Ea; 1 Ea = $1/12 = 0.083$ Bag
Kg	Quantity	2.202	Lbs	Quantity	CR_{Kg-Lbs} or $CR_{BU'-MU'}$	1 Lb = 0.454 Kg; 1 Kg = $1/0.454 = 2.202$ Lbs
Kg	Quantity	2.643	Ea	Count	CR_{Kg-Ea} or $CR_{BU'-BU}$	$(CR_{Lbs-Bag} \times CR_{Bag-Ea}) / CR_{Lbs-Kg} = (0.1 \times 12) / 0.454 = 2.643$
Ea	Count	0.3783	Kg	Quantity	CR_{Ea-Kg} or $CR_{BU'-BU'}$	1 Kg = 2.643 Ea; 1 Ea = $1/2.643 = 0.3783$ Kg

To create a conversion for a specific item between UOM classes (inter-class):

1. The appropriate item and the destination base UOM of the class are selected.
2. Using DVM, the base UOM (for example, Lbs) of Agile PLM for Process is mapped to the base UOM of E-Business Suite. To do this, the class (for example, class C2 is Quantity) to which the base UOM of E-Business Suite belongs is obtained.
3. Verification of whether the class of the source base unit (for example, class C1 is Count) is same as the class of the destination base unit is performed.
4. If both the classes are same, the conversion factor is set by which the source base unit is equivalent to the destination base unit (for example, $CR_{U-BU} = 1$). Next, the steps related to creating the [intra-class UOM conversions](#) are performed.
5. If the classes are different, the base UOM of 'Lbs' (for example, Kg is represented as BU' in the previous table) is obtained. Next, verification of whether an inter-class conversion between 'Ea' and 'Kg' exists or not (represented as CR_{BU-BU} in the previous table) is performed. If this conversion exists, the steps related to creating the [intra-class UOM conversions](#) are performed.
6. If an inter-class conversion does not exist, the list of UOMs for the class of the destination base unit (for example, Quantity) that has the standard conversions defined to the base UOM is obtained. Next, these UOMs are stored as a list (for example, $CR_{Lbs-Kg} = 0.454$ mentioned in the previous table).
7. The conversion factor provided for the item by Agile PLM for Process for any one of the UOM in this list (for example, CR_{MU-U} mentioned in the previous table) is obtained.
8. If a matching UOM does not exist in the list, the conversion rate for the specific item (for example, $CR_{BU-BU} = 1$ mentioned in the previous table) is set, the Create conversion API is called, and the steps related to creating the [intra-class UOM conversions](#) are performed.
9. If a matching UOM is found in the list (for example, $CR_{Lbs-Bag} = 0.1$ mentioned in the previous table), this UOM value is used and the inter-class conversion (for example, between 'Kg' and 'Ea' which is represented by $CR_{Kg-Ea} = 2.643$) is created. Refer the previous table for more information about the various mathematical relationships involved in the creation of inter-class conversions. Next, the appropriate APIs are called to create an item-specific conversion and the steps related to creating the [intra-class UOM conversions](#) are performed.

Creating Intra-Class UOM Conversions

An intra-class conversion is created when an item-specific conversion between UOMs belonging to the same UOM class needs to be defined. To do this, the conversion factor by which the UOM is equivalent to the base UOM established for this class is specified. For example, if one Lb (UOM) is equivalent to 16 Oz (base unit), the conversion rate is 16.

Note: Intra-class conversions are applicable to a specific item and the base (primary) UOM only.

To validate and create a conversion for a specific item within a UOM class (intra-class):

1. The appropriate UOM of the item is selected.
2. Verification of whether this UOM is equivalent to the base UOM established for the class identified for the selected item is performed. For example, verification of whether 'Lbs' which is represented as U' is the same as 'Kg' which is represented as BU' in the previous table is performed.
3. If these UOMs (for example, U' and BU') are the same, the conversion rate to 1 is set and validation is done to check whether it matches to the calculations done so far.
4. If these UOMs (for example, U' and BU') are not the same, the conversion between them is obtained. If the conversion is found, validation is done to check whether the conversion rate defined is the same as the calculated one (for example, CR_{U-BU}). If it matches, it denotes the end of processing. If the value does not match, an error is generated and changes are rolled back.
5. If the conversion is not found between the UOMs (for example, U' and BU'), the conversion rate (for example, CR_{U-BU}) is calculated and the Create UOM conversion API is called.

Chapter 3: Process Integration to Create and Syndicate Recipe

This chapter provides an overview of creating and syndicating recipes and discusses:

- Recipe Syndication Process
- AIA Services for Recipe Syndication
- Integration Services for Recipe Syndication

Overview

The Global Specification Management (GSM) feature in Agile PLM for Process application enables you to create a new formulation specification. Once this specification is in a syndicable state, it can be syndicated to Oracle E-Business Suite. In E-Business Suite, the external output is created as master item and all the BOM components (such as sub-components and ingredients) are assigned to the owning organization. Finally, a new formula is created. Based on the Oracle Process Manufacturing (OPM) setup, a recipe could be automatically created at the time of formula creation. A routing will be manually added to the recipe. The recipe and routing details (that includes steps, quantity, and instructions) from Agile PLM for Process are sent as normalized data that is converted into a [text attachment](#). This attachment is created at the formula level in OPM.

Recipe Syndication Process

As a prerequisite for a formulation (or formula) specification to be successfully syndicated, all the BOM items need to previously exist in E-Business Suite. The setup prerequisite for this process stipulates that master items should be previously syndicated with the exception of external output (or product), which is created as part of the formula syndication process. The items need to be syndicated prior to the formula syndication. If any of the items do not exist, the process is faulted.

If a packaging specification has packaging sub-components, the packaging item is created in the master organization and an OPM formula is created to represent the sub-components in the owning organization. The formula is created in OPM after the syndication of the item. Each new issue becomes a new formula version if the formula is version controlled in OPM.

Process Flow of Recipe Syndication

The recipe syndication process involves the following steps:

1. Create a formula for BOM items using formulation specifications in Agile PLM for Process. Packaging and trade specifications with sub-components can also be syndicated as a recipe. An output payload or Agile PLM for Process -specific message application business message (ABM) is generated.

For more information, see [Creating Formulation Specifications](#).

2. The Content Synchronization and Syndication (CSS) module within Agile PLM for Process then starts the syndication process. The *SyncSpecPLM4PReqABCImpl* (Requester Application Business Connector Service) converts the application-specific Application Business Message (ABM) to a canonical representation of Enterprise Business Message (SyncProductionRecipeListEBM).

The *SyncSpecPLM4PReqABCImpl* uses the existing domain value mappings (DVM) to populate the Recipe Enterprise Business Object (EBO) with common mappings. It also creates the AIA XREF for the Specification Number and Issue Number. Once the EBM is formed, it becomes the payload for the provider *SyncProductionRecipeListEbizProvABCImpl* service. The organization information is a part of the EBM. If they are not assigned to the organization, the appropriate Item API is called to assign these items to the organization.

Note: During recipe synchronization, Agile PLM for Process sends the owning organization information based on their extended attributes. If it is sent, the item(s) are assigned to that organization and the formula is created in that organization. If it is not sent, the value of the property DEFAULT.FORMULA.OWNING.ORG.CODE present in the AIA configuration file is selected by default. Next, the PIP assigns the item(s) to that organization and then creates the formula.

3. Before the Item APIs are called, the EBMs are converted to E-Business Suite-specific ABM with the help of domain value mappings (DVM).
4. Once the conversion to ABM is complete, the product, co-product, by-product, and the ingredients are assigned to the specified organization.
5. Once the items are assigned to the specified organization, a formula is created using the aforementioned items in that organization. To do this, the appropriate wrapper APIs in E-Business Suite are called to either create or update the formula in that organization. The wrapper API performs all the validations before creating or updating the formula.

For more information, see [Versioning](#).

Note: Functional errors may result if an Item was not syndicated earlier or the formula is in a non-updateable state. In such cases, informative error messages with supporting information (such as the business object processed, the exception occurred, and so on) are logged and propagated. The user can view the errors and take corrective action. System-related errors are displayed in the BPEL console and email notifications are sent to the appropriate people.

6. [Recipe](#) and [Routing](#) details such as steps, quantities, and instructions from Agile PLM for Process are sent as normalized data (metadata). The *SyncProductionRecipeListEbizProvABCImpl* converts this data to a [text attachment](#) as per the pre-specified format at the formula level in OPM.

Note: A recipe can be created automatically depending on the OPM configuration rules of the Automatic Recipe Generation feature. A routing can be created or selected manually within the recipe.

7. The [text attachment](#) is then attached to the newly created or updated formula.
8. Once the formula is created successfully, the *SyncProductionRecipeListEbizProvABCImpl* creates the AIA XREF for Formula_ID and passes the response message back.
9. Finally, *SyncSpecPLM4PReqABCImpl* obtains *SyncProductionRecipeListResponseEBM*. The requester ABCS then transforms the message to Agile PLM for Process -specific ABM and stores the E-Business Suite OPM-specific cross-reference formula ID in Agile PLM for Process.

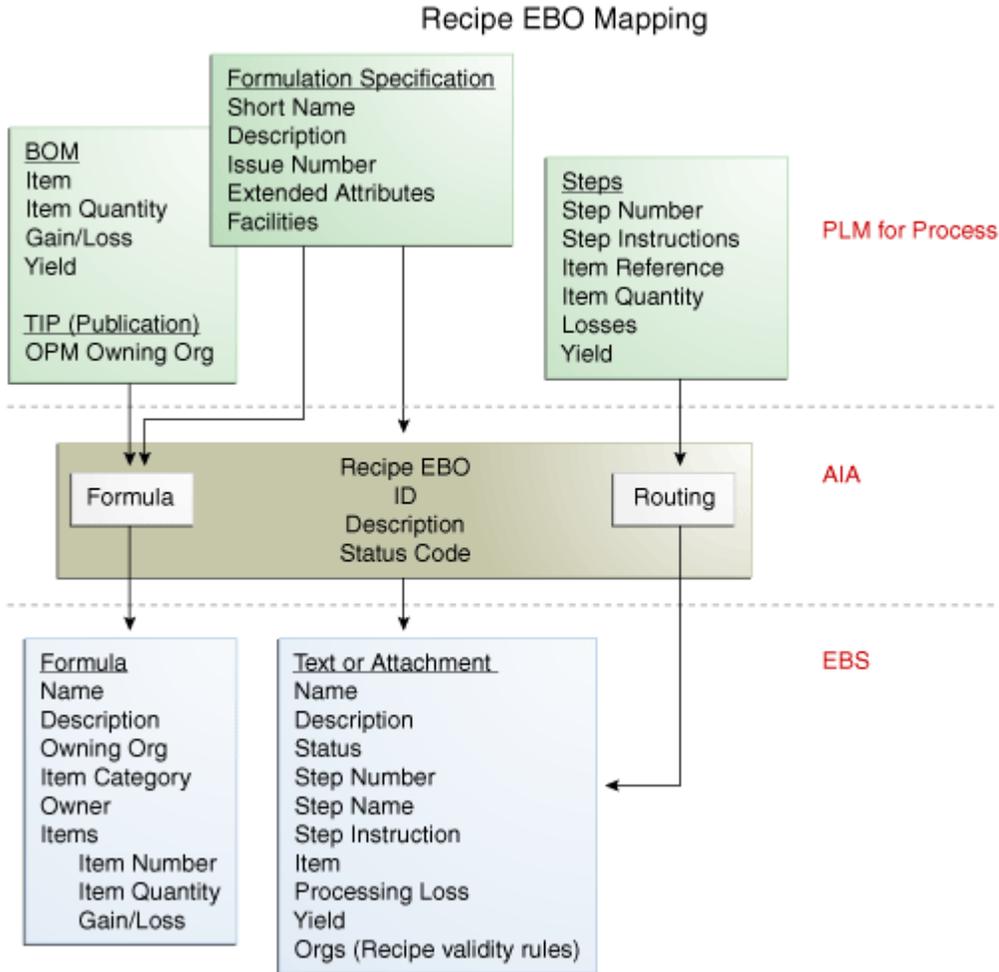
Creating Formulation Specifications

Formulation specifications in Agile PLM for Process are equivalent to recipes in OPM. A new formulation specification in Agile PLM for Process can be created and syndicated to E-Business Suite. This specification is syndicated to the Recipe Enterprise Business Service (EBO), which contains the formula and routing child components. The formula child component is syndicated to a formula in OPM. The formula from Agile PLM for Process is syndicated on the basis of a particular owning organization. Once syndicated, the E-Business Suite user can copy the formula to appropriate organizations and make the necessary changes.

For more information, see [Recipe](#) and [Routing](#).

The requester application sends a sync Item first and then calls the sync recipe if the recipe refers to items that are not present in Oracle E-Business Suite. Therefore, the E-Business Suite application needs to contain the item at least in the master organization before the recipe (referring to these items) is created. The requester application utilizes a synchronization call for an item before sending the recipe that uses asynchronous calls for processing the Item before processing a recipe in OPM of E-Business Suite. The creation of a recipe depends on the user's setup configurations in OPM. This setup dictates whether to auto-create the recipe or not.

The following diagram illustrates the EBO mapping of a recipe:



EBO mapping of recipes

Formulation specification represents a recipe in Agile PLM for Process. Recipe specification syndicates to both the formula and routing in the Recipe Enterprise Business Object (EBO). An OPM formula is created. The recipe and routing details from Agile PLM for Process are converted into a text attachment, which is created at the formula level in OPM.

Operations and Resources

In OPM, an Operation denotes a combination of one or more activities and the resources used to perform those activities. For example, the combination of mixing (activity) and the mixer (resource) defines the mixing operation. Resources are assets (for example, ovens, mixers, and so on) to produce batches including production equipment and labor. Resources are later associated with activities to form operations.

Formula

Production batches are based on formulas defined in production environment. Formulas are also used for planning, managing costs, and regulatory compliance. The basic formula definition consists of the formula headers, products, ingredients, and by-products. Formulas are lists of ingredients (or a statement of ingredient requirements or sequencing directions) and products with their associated quantities and processing instructions. The default status for a newly created formula is 'New' and it is not updated as per the values from Agile PLM for Process.

In the E-Business Suite, the external output is created as a master item, and all the BOM components (such as sub-components and ingredients) are assigned to the owning organization to create a new formula. Formula classifications are used to secure percentage breakdowns on ingredient, product, and trade specifications.

Note: If the formula description in Agile PLM for Process mapped to the formula description in E-Business Suite exceeds 70 characters in length, it gets truncated automatically.

Once the recipe is available in OPM, further data (including site-specific data) is added to meet the needs of the manufacturing systems. In OPM, the differences between general and site-specific formulas are based on the owning organization of the formula and the recipe type. A general formula is used as the basis for a site-specific formula. Instead of using a general formula directly in a site-specific recipe, it is first copied and the necessary changes for the specific site are done using the OPM Formulator. A site-specific formula is used directly in the site recipe.

Formula Classes

Formula classes group formulas with similar characteristics and requirements for reporting purposes. For example, you can use a formula class to classify packaging formulas or bulk formulas. You can group operations with similar characteristics and requirements for reporting purposes. For example, you can set up classes for mixing, heating, drying, or grinding. Formula classes are user-defined and can be used to group formulas based on the user's requirements.

Phantoms

In OPM, Phantoms are intermediate formulas that are not manufactured as products. Since phantoms are intermediates, they are also referred to as sub-assemblies. Phantom formulas are associated with formula ingredients and then generated when a batch is created using the parent formula. Phantom functionality is a fixed method of multi-batch management. Once several batches are linked by a production or a phantom type dependency, you can manage them as a single production event. The method for building a formula that generates a phantom is the same method used to build another standard formula. However, the product of the phantom formula is an ingredient in the parent formula. For this PIP, the default value is '0' which means 'not a phantom.'

By-Products

In OPM, By-products are materials generated as part of the production process that is not planned for. It is an item produced by a formula in addition to the product. By-products may be used as ingredients or as sold or discarded materials and differ from products in that you do not plan your production to make by-products. By-products can have monetary value, but generally have less monetary value than products. In some instances, there can be a cost associated with disposing of a by-product. When by-products are defined as part of the formula, an indicator of a by-product type is available. This definition is used as an OPM quality to document the inventory by-product in a batch based on a sample size. You can achieve this step by associating a by-product with any step where a sample is represented and the by-product type is established. Possible values for a by-product are yield, waste, and rework. In OPM, a co-product denotes one of several products produced by a formula. It is also used when a formula produces more than one product. OPM does not distinguish between products and co-products. The products, co-products, and by-products should be defined in the master and the owning organization before it can be used in the formula. Agile PLM for Process sends a list of external outputs (including co-products) in the Item EBO. The Provider ABCS creates these outputs in the master and the owning organization. Only after the completion of this step, the Recipe EBO is sent for formula creation in E-Business Suite (OPM).

Recipe

Recipes standardize the structure of the information that describes the production of one or all products. Recipes have formulas that define the relationship of materials, products, ingredients, and by-products. Recipes, formulas, operations, and activities are managed by status codes. You can add your own status codes and build additional rules to manage business processes. You can use recipes as a foundation for cost management and product execution, where routings are used to specify process-related requirements such as equipment, labor, and energy. The recipe defines the input and output of each operation step. This is achieved by linking formula materials and quantities to the appropriate routing steps as a prerequisite to enabling automatic step calculation.

In OPM, a recipe denotes an entity that contains the minimum set of information that uniquely defines the manufacturing requirements for a specific product. Recipes provide a way to describe products and how those products are produced. The routing data and the header information about the recipe are captured as a text attachment of the formula. Based on the OPM setup, a recipe is created automatically during formula creation. The setup prerequisites depend on individual requirements. A recipe validity rule represents the combination of a quantity of material and an effective date that is used by production, planning, costing, or regulatory in one or more specified organizations.

OPM contains a recipe structure that complies with the industry-standard definition. To automate the change management process of the recipes, OPM employs the Oracle workflow and recipe statuses to maintain the role-based security as well as to validate the business rules and retain the audit of change requests and re-approvals. Recipe validity rules provide a combination of the standard quantity and effective dates of a recipe that is used by production, planning, or costing departments in one or more specified organizations. These rules determine what, where, when, and how a recipe should be used. Thus, recipe validity rules allow you to specify under which condition and for what purpose a particular recipe can be used to maximize raw materials and leverage their inherent variability. Recipes link the materials, processes, and plant-specific equipment used during the production batch. This facilitates the creation of more accurate recipes and easy maintenance of generic routings and operations.

To change the status of a formula or recipe in OPM, Agile PLM for Process sends a workflow notification (instead of automatic status update) to an OPM user when the formulation specification has entered the appropriate stage. In addition, an OPM user can be placed on the signature list for any stage in the workflow including an EOL one. This OPM user needs to have a valid Agile PLM for Process User ID.

Versioning

A Version in OPM refers to a number identifying a variant of a formula, operation, routing, or recipe. In OPM, a setting controls whether versioning is 'On' or 'Off.' If it is on, new versions of a formula will be created, if required. However, if it is off, no new version of the formula is created. This table illustrates the differences between 'Versioning is off' and 'Versioning is on' states for formulation specification in Oracle E-Business Suite:

Scenario	Versioning is Off	Versioning is On
New Issue of Formulation Specification	The Product Developer creates a new issue of a Formulation Specification in GSM. After the syndication process to E-Business Suite is completed, OPM creates a new version of the formula. If the external output is different from the previous syndication, or additional external outputs defined, then the external output is created as master item and all the BOM components (such as sub-components and ingredients) are assigned to the owning organization. Finally, a new Formula is created.	The description is same as that mentioned under the 'Versioning is Off' state.
Editable Formula update	The Product Developer updates an issue of a Formula that already exists in OPM. This Formula is updated with the latest one from Agile PLM for Process. The Recipe and Routing details from Agile PLM for Process are updated as text attachment. If the Formula update fails for any reason, appropriate error messages will be logged and propagated.	An error is generated.
Non-editable Formula update	An error is generated.	The Product Developer updates an issue of a Formula that already exists in OPM and is in a state that does not allow updates. In this case, an error is generated and the process is faulted. An informative error will be written to the log.
The Product Developer creates or	It is assumed that master item has	It is assumed that master item has

Scenario	Versioning is Off	Versioning is On
updates a Formula that has a Reference output material	already been created for the Referenced output. Hence, if it does not exist, the process is faulted. An informative error will be written to the log.	already been created for the Referenced output. Hence, if it does not exist, the process is halted. An informative error will be written to the log.

Routing

In OPM, a Routing is a sequential set of operations that are performed to complete a production batch. You can also specify a routing in the recipe, although routings are optional. You can override routing attributes such as capacity, activity factor, and resource usage for each recipe you define. If a recipe is set up for an automatic step quantity calculation, you need to ensure that formula material is properly associated to each appropriate routing step and that UOM conversions between items have been defined.

Note: In this PIP, OPM does not facilitate the automatic creation of routings because there is no way to automate the step-material associations given that the routings are manually selected or created by the Oracle E-Business Suite user.

Routings are defined in terms of operations. The operations are presented in a series of steps organized into an orderly set of activities. Routings are sequential sets of operations that must be performed to complete a production batch. They are linked to recipes that have validity rules.

Note: Different formulas can use the same routing or one formula can be associated to several different routings. It is useful to set up routing classes to group routings with similar characteristics and requirements for reporting purposes. You can define multiple versions of a routing that make the same product to accommodate the several production lines with different characteristics.

Routings are added manually to a recipe. Since operation routings are modeled into the structure of a recipe, several attributes can be defined at the recipe levels including planned process loss, step quantity, capacity, and activity factor. Since a single product can be associated with several routings, it can have different costs depending on the specified routings. Product development tracks the route that the ingredients follow, thereby tracking appropriate costs. Since a routing represents a sequence of operations or steps used during the manufacturing process, you must specify each of the operations in a sequential order with their respective step quantities. Routings support automatic calculation of step quantities based on material input and output. Once the routing is associated with a recipe, step quantities can automatically be calculated based on the amount of materials, input, and output for each step.

Step Dependencies

Step dependencies are those relationships between routing steps that establish whether a specific step can start until another step is completed. The two important attributes of step dependencies are the dependency type and the transfer percentage. Dependency type declares when a step can begin. Transfer percentage determines how much material is transferred from step to step. Step dependencies and step material associations enable recipes to automatically calculate step quantities.

Step dependencies are not automatically generated in a sequential order based on the routing. User must specify the linkage between steps (for example, 10FS20 and 20FS30), as well as minimum delay, maximum delay, and transfer percent from one step to another.

You can use a theoretical process loss to reflect a planned percentage of material that is lost for a specific routing. To do this, calculate the actual ingredient usage from a production perspective, which will accommodate for that loss and standard costing. For example, if you mix a quantity of material up to 100 lbs, you can predict a loss of 1.5% or up to 1.5 lbs. However, if you mixed a quantity between 1 and 500 lbs, you might predict a loss of 1.75% or up to 8.75 lbs. This loss can be attributed to equipment, evaporation, or any other aspect of the routing that would not deliver the full quantity of the material added.

File and Text Attachments

The recipe and routing details from Agile PLM for Process are sent as normalized data through the Recipe EBO to E-Business Suite. The SyncRecipe Provider ABCS in E-Business Suite converts these details into a non-editable file and text attachments. Based on this information, E-Business Suite users can manually map the routing steps.

The file attachment has the following format:

- **Formula:** Formula Number (OPM value) or Short Name (Agile PLM for Process value)
- **Description:** Formula Description (OPM value) or Name (Agile PLM for Process value)
- **Syndicated Status:** Formula Status (Agile PLM for Process value)
- **Manufacturing facilities:** Facility Name (*Facility Reference-ID*, which is an optional Agile PLM for Process value)
- **Step number:** Step Name (Agile PLM for Process value)
- **Instructions:** Instructions (Agile PLM for Process value)
- **Ingredients/Co-Products/By-Products:**

Line Number	Item Code	Item Description	Quantity	UOM
Formula Line Number (OPM value)	Item Part Number (OPM value)/ Item Spec Number (Agile PLM for Process value)	Item Description (OPM value)/ Item Spec Name (Agile PLM for Process value)	Formula Line Quantity (OPM value)/ Item Quantity (Agile PLM for Process value)	Formula Line UOM (OPM value)/ Item UOM (Agile PLM for Process value)

The text attachment has the following format:

- Formula
- Description
- Syndicated Status
- Manufacturing facilities
- Step number
- Instructions

- Ingredients/Co-Products/By-Products

Line Number	Item Code	Item Description	Quantity	UOM
First Ingredient /Co-product /By-product				
Second Ingredient /Co-product /By-product				

Calculating Scrap Factor and Required Quantity

This section describes how to calculate attributes such as Item Quantity, Required Quantity, and Scrap Factor of a formula product line from Agile PLM for Process to OPM in Oracle E-Business Suite. For these calculations, formula attributes such as Yield, Gain/Loss, and Original Quantity are used in Agile PLM for Process and Required Quantity and Item Quantity are used in OPM.

Item Quantity

Item quantity denotes the quantity consumed (required amount of ingredient) or produced. This OPM value is mapped to the yield quantity in Agile PLM for Process. If the yield in Agile PLM for Process is equal to or lesser than its original quantity, then the item quantity in OPM is the same as the yield in Agile PLM for Process. If the yield in Agile PLM for Process is greater than its original quantity, then the item quantity in OPM is the same as the original quantity in Agile PLM for Process.

Required Quantity

Required Quantity in OPM is the equivalent of Original Quantity in Agile PLM for Process. Required quantity denotes the ingredient quantity adjusted to compensate for the scrap factor. For example, if the original ingredient quantity was 100 lbs and the scrap factor was 10%, the required quantity would be 110 lbs. In OPM, the required quantity is calculated using this formula:

$$\text{Required Quantity} = \text{Original Quantity} + (\text{Scrap Factor} \times \text{Original Quantity})$$

The following table describes an example using the previously mentioned formulas:

Ingredient	Quantity	Gain/Loss	Yield	OPM Quantity or Agile PLM for Process Yield	Scrap Factor	Required Quantity in Agile PLM for Process
Strawberry	80	0.80	64	64	0.25	80
Sugar	20	1.25	25	20	0	20

Scrap factor should not be mapped directly to OPM. The integration layer implements the conversion to the required quantity in OPM. In the previous example, for Strawberry, the corresponding OPM quantity defined for the item is 80, with a scrap factor of 25%, and the required quantity as 80. For Sugar, having a gain for scrap factor is not practical for OPM as any gain is considered a by-product. The ABCS in Agile PLM for Process loads the scrap factor into the EBO. However, in E-Business Suite, the Application Business Connector Service (ABCS) ignores it because it calculates the scrap factor. For BOM Items that do not have scrap factor or gain/loss defined in Agile PLM for Process, the EBO is loaded by Agile PLM for Process with the same value for both quantity and yield and assign the value as 1 for scrap factor.

Scrap Factor

Scrap Factor denotes the anticipated amount (in percentage) of ingredient lost in the manufacturing process. OPM does not allow a negative scrap factor because scrap factor is a percentage of manufacturing loss. The scrap factor of Agile PLM for Process is not the same as that of OPM. Hence, it is calculated based on the original quantity and required quantity, and then stored in OPM.

Note: The reason for OPM not having a negative scrap factor or a positive gain/loss ratio in Agile PLM for Process terminology is: OPM does not natively track the ingredient yield as in Agile PLM for Process, unless an intermediate item is modeled for the output of one step that in turn serves as an ingredient in the next step of the recipe. Nested formulas can be created in OPM to represent the multiple levels of input and output. Hence, scrap factor is not the way to model a positive gain; instead an intermediate is added as a product that is yielded from the formula.

Agile PLM for Process populates the Enterprise Business Object (EBO) for future integrations. E-Business Suite ignores this value and calculates the scrap factor using this formula:

$$\text{Scrap Factor} = (\text{Required Quantity} - \text{Original Quantity}) / \text{Original Quantity}$$

The required quantity in OPM is mapped to the original quantity in Agile PLM for Process. E-Business Suite uses this value to calculate the scrap factor. If the yield in Agile PLM for Process is equal to or lesser than its original quantity, then the scrap factor in OPM is the same as $(\text{OPM Required Quantity} - \text{OPM Original Quantity}) / \text{OPM Original Quantity}$. If the yield in Agile PLM for Process is greater than its original quantity, then the scrap factor in OPM is 0. Additionally, if the yield is lesser than the original quantity, then the required quantity is equal to the original quantity and the item quantity is equal to the yield. If the yield is more than the original quantity, then the required quantity is equal to the original quantity and the item quantity is equal to the original quantity.

In Agile PLM for Process, the output of each step can be identified; however, OPM does not necessarily need to support the identification of a step output (as an intermediate) since it is assumed that it is consumed in the next step. The advantage is that Agile PLM for Process can model a product loss on the step, whereas OPM only supports either an ingredient scrap factor or a routing process loss. In addition, OPM does not facilitate the automatic creation of routings because additional steps might be needed for plant- or equipment-specific operation steps or instructions, and not just material steps coming from Agile PLM for Process.

Yield

Yield denotes the quantity of product generated and types include:

- **Automatic:** Denotes whether the product line is released or completed automatically when the

subsequent steps are released or completed from the batch.

- **Manual:** Denotes whether the product line is released or completed manually.
- **Incremental:** Denotes whether the product line is released incrementally.
- **Automatic by step:** Denotes whether products are yielded automatically when the step is completed.
- **Scale type:** Denotes whether the scaling is fixed, proportional, or integer. When items are defined as fixed scale, their quantities are not altered when a formula is scaled. Items that are proportionally scaled have their quantities changed when a formula is scaled up or down. Integer scaling enables you to scale integers and whole numbers (for example, whole bags or whole cases). The default Scale Type value is 1 that denotes proportional scaling; 0 denotes fixed or no scaling and 2 denotes integer scaling. The Contribute to Yield attribute defines whether the ingredient quantity contributes to the product quantity. In all cases, the quantities of ingredients and products or by-products must be converted to a common UOM.

For more information about UOMs, see [UOM Conversions](#).

AIA Services for Recipe Syndication

For more information about the industry components used in the integration process for creating and syndicating recipes, see [AIA Services for Raw Material Syndication](#).

Agile PLM for Process and Oracle E-Business Suite Components for Recipe Syndication

For more information about the Agile PLM for Process and Oracle E-Business Suite components involved in recipe syndication, see [Agile PLM for Process and Oracle E-Business Suite Components for Raw Material Syndication](#).

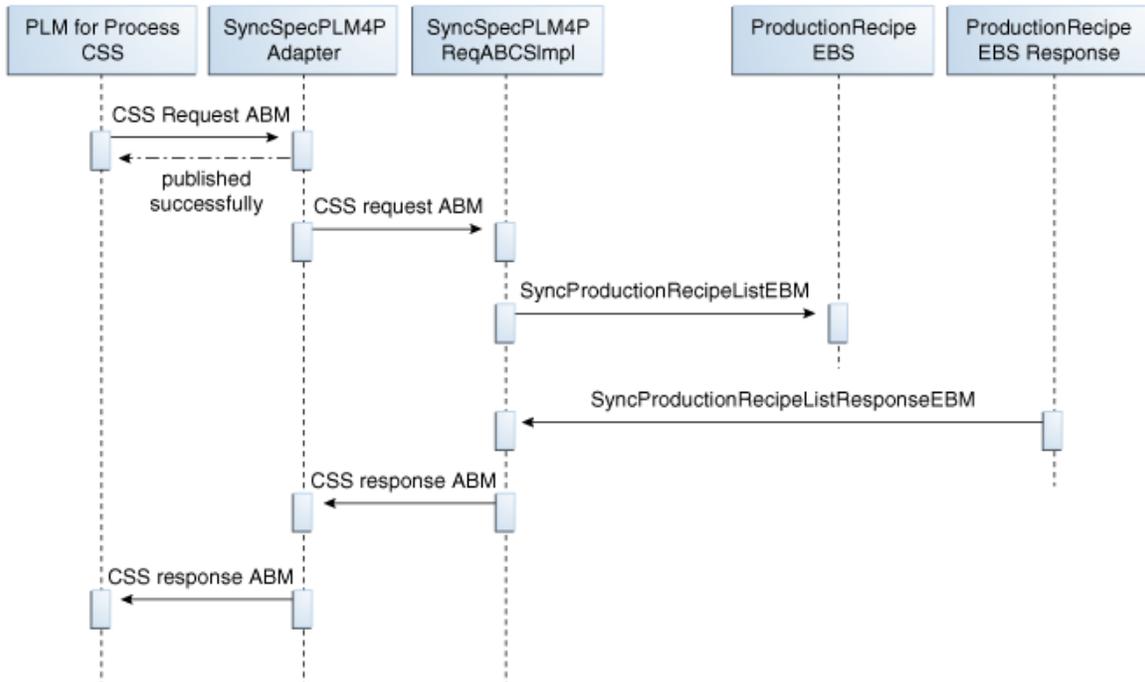
Integration Services for Recipe Syndication

As part of the integration flow, the following services are delivered for recipe syndication:

- [SyncSpecPLM4PAdapter](#)
- [SyncSpecPLM4PReqABCImpl](#)
- [ItemEBSV2](#)
- [ProductionRecipeEBS](#)

- [SyncItemLEbizProvABCImpl](#)
- [SyncProductionRecipeListEbizProvABCImpl](#)
- [ItemResponseEBSV2](#)
- [ProductionRecipeResponseEBS](#)
- [SyncItemLEbizAdapter](#)
- [SyncRecipeListEbizAdapter](#)

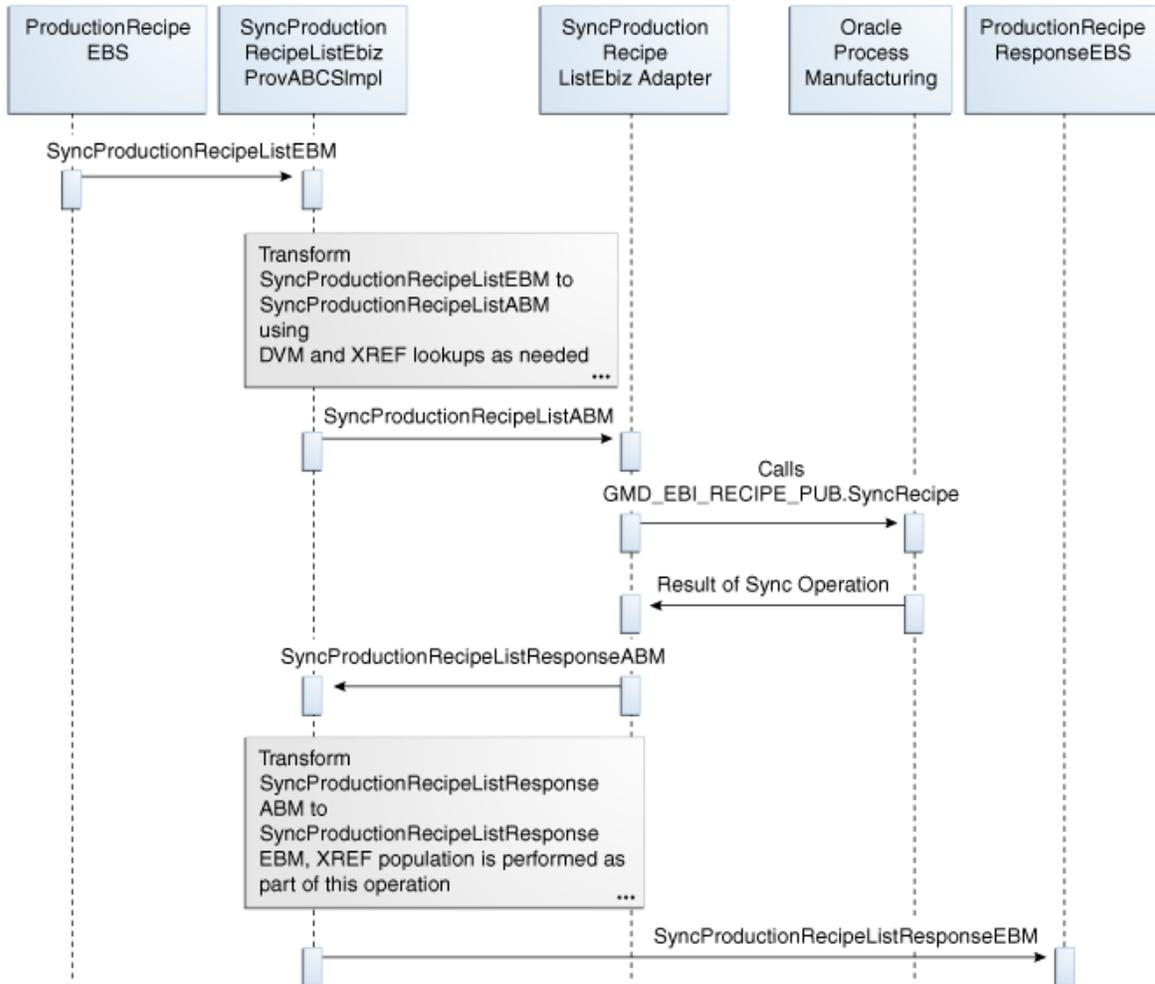
This sequence diagram illustrates the integration services used for recipe syndication in Agile PLM for Process:



Integration services used for recipe syndication in Agile PLM for Process

For more information about the integration services used for recipe syndication in Agile PLM for Process, see the services mentioned in [Integration Services for Recipe Syndication](#).

This sequence diagram illustrates the integration services used for recipe syndication in E-Business Suite:



Integration services used for recipe syndication in E-Business Suite

For more information about the integration services used for recipe syndication in E-Business Suite, see the services mentioned in [Integration Services for Recipe Syndication](#).

Essential DVMs for Recipe Syndication

For more information about the DVMs that should be set for the recipe syndication process to flow successfully, see [Recipe DVMs in Agile PLM for Process](#) and [Recipe DVMs in E-Business Suite](#).

Chapter 4: Process Integration to Create and Syndicate Finished Goods

This chapter provides an overview of creating and syndicating finished goods and discusses:

- Finished Goods Syndication Process
- Integration Services for Finished Goods Syndication
- Solution Assumptions

Overview

The creation of a finished good (inventory item) originates in Agile PLM for Process and represents a trade specification. You can initiate the syndication of finished goods through the Content Synchronization and Syndication (CSS) module in Agile PLM for Process. Once a finished good is in a syndicable state, it can be syndicated to E-Business Suite. An inventory item and formula are automatically created in Oracle Process Manufacturing (OPM) of E-Business Suite. In this case, no recipe and routing information are sent, as they are not applicable to finished goods. If you create a new issue of a syndicated trade specification in Global Specification Management (GSM), then the same item (or finished good) as the one created previously gets updated. A new version of formula is also created in OPM.

Finished Goods Syndication Process

The setup prerequisite for finished goods syndication stipulates that the master Items for the BOM should have been previously syndicated. The organization items will be created as part of this process if they do not already exist. The main finished good item is created in the master and the owning organization also as part of this process.

Note: The finished good syndication process is the same as the raw material with BOM syndication process.

When you create a trade specification, add the necessary data to it such as an ingredient or output material (that represents the main product), the packaging BOM, lower-level trade item, dimensions, and other attributes.

For more information about the process of recipe syndication, see [Raw Material Syndication Process](#).

At any point in the trade Item's lifecycle, you can decide to syndicate it to the Enterprise Resource Planning system for planning, procurement, and manufacturing. The item represents the header information of the trade item such as Name and Description. The formula contains the trade item's packaging BOM, ingredient, lower-level trade items, and the item that was previously created to represent the current trade in E-Business Suite. For example, a "jar of strawberry jam" (trading unit) consists of 32 oz of strawberry jam and 1 unit of "jar with label", along with the output denoted as 1 unit of "jar of strawberry jam".

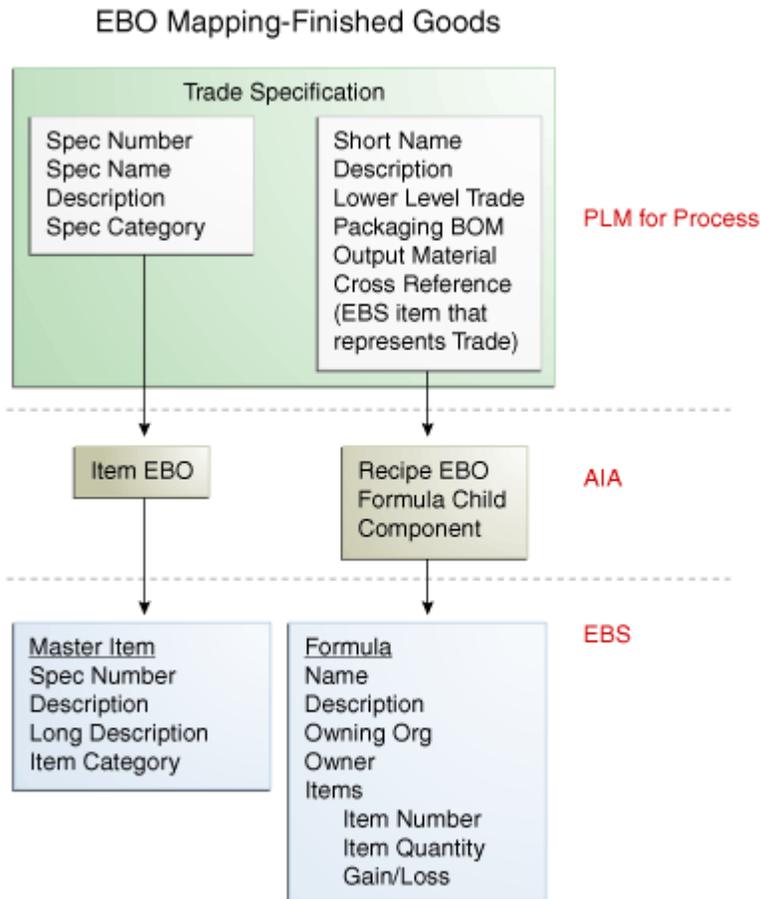
When the trade item is syndicated to E-Business Suite, a finished good item gets created in E-Business Suite. After successful creation of the item, a formula is created in OPM of E-Business Suite. However, if lower-level BOM items do not exist, the formula is not created.

When you update an existing issue of an updateable BOM trade specification in GSM (when versioning is off), the finished good item in E-Business Suite and the formula in OPM are updated. If the item update fails for any reason, appropriate error messages are logged and propagated, as well as the OPM formula is not updated. If formula update fails for any reason, appropriate error messages will be logged and propagated. However, the Item update will not be rolled back.

When you update an existing issue of a non-updateable BOM trade specification in GSM (when versioning is on), only the finished good item in E-Business Suite is updated. In this case, the OPM formula is not updated. An informative error will be written to the log stating that the formula is not updated due to non-editable state. If the item update fails for any reason, appropriate error messages will be logged and propagated. In this case, the formula will not be updated in OPM.

Note: If you encounter new issues in Agile PLM for Process for finished good items that contain BOM, then a new version of the formula is created in OPM.

The following flowchart illustrates the EBO mapping for finished goods:



EBO mapping for finished goods

The trade specification represents a finished good in Agile PLM for Process. This trade specification syndicates to both the Item Enterprise Business Object (EBO) and the formula component of the Recipe EBO. From the Item EBO, a master item in Oracle Inventory of E-Business Suite gets created. From the Recipe EBO, an OPM Formula is created. The text attachment (created for Recipe) is not required because there is no routing information present in a trade specification.

Integration Services for Finished Goods Syndication

As part of the integration flow, the following services are delivered for finished goods syndication:

- [SyncSpecPLM4PAdapter](#)
- [SyncSpecPLM4PReqABCSImpl](#)
- [ItemEBSV2](#)

- [ProductionRecipeEBS](#)
- [SyncItemListEbizProvABCImpl](#)
- [SyncProductionRecipeListEbizProvABCImpl](#)
- [ItemResponseEBSV2](#)
- [ProductionRecipeResponseEBS](#)
- [SyncItemListEbizAdapter](#)
- [SyncRecipeListEbizAdapter](#)

Solution Assumptions

The solution assumption is that if Name or Description of the trade Item is in multi-byte languages, then the customer has to ensure that the length restrictions are met using custom transformations.

Chapter 5: Configuring the Agile PLM for Process Integration Pack

This chapter provides instructions for configuring the Agile PLM for Process integration pack and discusses:

- Setting up Agile PLM for Process
- Configuration Parameters
- Setting up External IDs in Agile PLM for Process
- Creating Extended Attributes in Agile PLM for Process
- Working with DVMs
- Working with AIA Cross-References
- Handling Errors

Setting up Agile PLM for Process

After installation of Agile PIP, the Agile Administrator needs to set up Content Synchronization and Syndication (CSS).

To set up CSS, perform the following steps:

1. Create syndication user.
2. Create target system cross-reference.
3. Create GSM and CSS workflow.
4. Create publication namespace and associate it with the GSM and CSS workflow.
5. Set up publication path.
6. Set up CSS Poller and Reconciler.
7. Modify CSSLibConfig.xml configuration file with Syndication URL and SOAP transporter.
8. Enable Remoting Container Syndication Service.
9. Restart Remoting Container Service.

To configure the CSS extension and System IDs for Agile PIP:
--

1. Configure CSS extension:

In <Prodika_Home>\config\Extensions\CustomPluginExtensions.xml under the PluginExtensions\FormatPlugins section, uncomment the line:

```
<Plugin name="CSSFormulationExtension"
FactoryURL="Class:Xeno.Prodika.CSS.MessageGeneration.Plugins.CSSBomPluginFactor
y,CSSLib" />
```

to enable the CSS extension.

2. Configure System IDS in CSS:

In <Prodika_Home>\Reports\CSS\StandardEnvelope.xsl, update the sender element to PLM4P_01 and the receiver element to EBIZ_01:

```
<xsl:element name="css:sender">
  <xsl:text>PLM4P_01</xsl:text>
</xsl:element>
<xsl:element name="css:receiver">
  <xsl:text>EBIZ_01</xsl:text>
</xsl:element>
```

To enable the HTTP basic authentication:
--

1. Create a web application with name "CSS" under "ProdikaContracts" virtual directory and direct it to path: <PLM4P_Home>\Web\Integration\Contracts\Prodika\CSS
2. Copy the binaries from "<PLM4P_Home>\Web\Integration\bin" to "<PLM4P_Home>\Web\Integration\Contracts\Prodika\CSS\bin"
3. Create a new config file with name "Web.config" in folder: "<PLM4P_Home>\Web\Integration\Contracts\Prodika\CSS\" with the following contents:

```
<?xml version="1.0"?>
<configuration>
  <system.web>
    <httpModules>
      <remove name="FormsAuthenticationHelperModule"/>
    </httpModules>
    <authentication mode="Windows"/>
  </system.web>
  <system.serviceModel>
    <bindings>
      <basicHttpBinding>
        <binding name="basicAuthBinding">
          <security mode="TransportCredentialOnly">
            <transport clientCredentialType="Basic" />
          </security>
        </binding>
```

```

        </basicHttpBinding>
    </bindings>
    <services>
        <service behaviorConfiguration="serviceBehavior"
name="Xeno.Prodika.ProdikaAPI.CSS.CSSServices">
            <endpoint binding="basicHttpBinding"
bindingConfiguration="basicAuthBinding"
contract="Xeno.Prodika.ProdikaAPI.CSS.ICSSServices" />
        </service>
    </services>
</system.serviceModel>
</configuration>

```

Configuration Parameters

This PIP uses various configuration parameters that control the behavior of the flow. Standard AIA XML configuration file, **AIAConfigurationProperties.xml**, located at `$AIA_HOME/aia_instances/$INSTANCE_NAME/AIAMetaData/config`, is used for capturing the configuration parameters. AIA configuration file supports the system level configuration parameters, service level parameters, and module configuration parameters.

System level parameters apply to all PIPs running on the SOA suite. Service level parameters can be configured at the individual service level such as ABCS.

Note: The configuration properties from Agile Module and Oracle E-Business Suite Module are listed separately in this section, only for the purpose of identification. The actual **AIAConfigurationProperties.xml** file on AIA Server is a merger of both.

Configuration parameter options for this PIP are:

- **Module Level** configuration parameters: The PIP exposes some E-Business Suite module level configuration properties, which need to be set for the E-Business Suite side of the ABCS to work correctly.
- **Service Level** configuration parameters: While most configuration requirements are satisfied by the PIP level configuration parameters, sometimes the behavior of a flow needs to be controlled at the service level. These parameters can be captured using AIA service configuration parameters. Service configuration entry is identified by the service name such as `SyncSpecPLM4PReqABCImpl`.

Note: For more information about requirements for working with **AIAConfigurationProperties.xml**, see *Oracle Fusion Middleware Developer's Guide for Oracle Application Integration Architecture Foundation Pack*, "Building AIA Integration Flows," How to Set Up AIA Workstation.

Note: See *Oracle Fusion Middleware Infrastructure Components and Utilities User's Guide for Oracle Application Integration Architecture Foundation Pack*, "Working with the Oracle Enterprise Repository (OER)," Loading Oracle AIA Configuration Properties File Updates.

Setting up External IDs in Agile PLM for Process

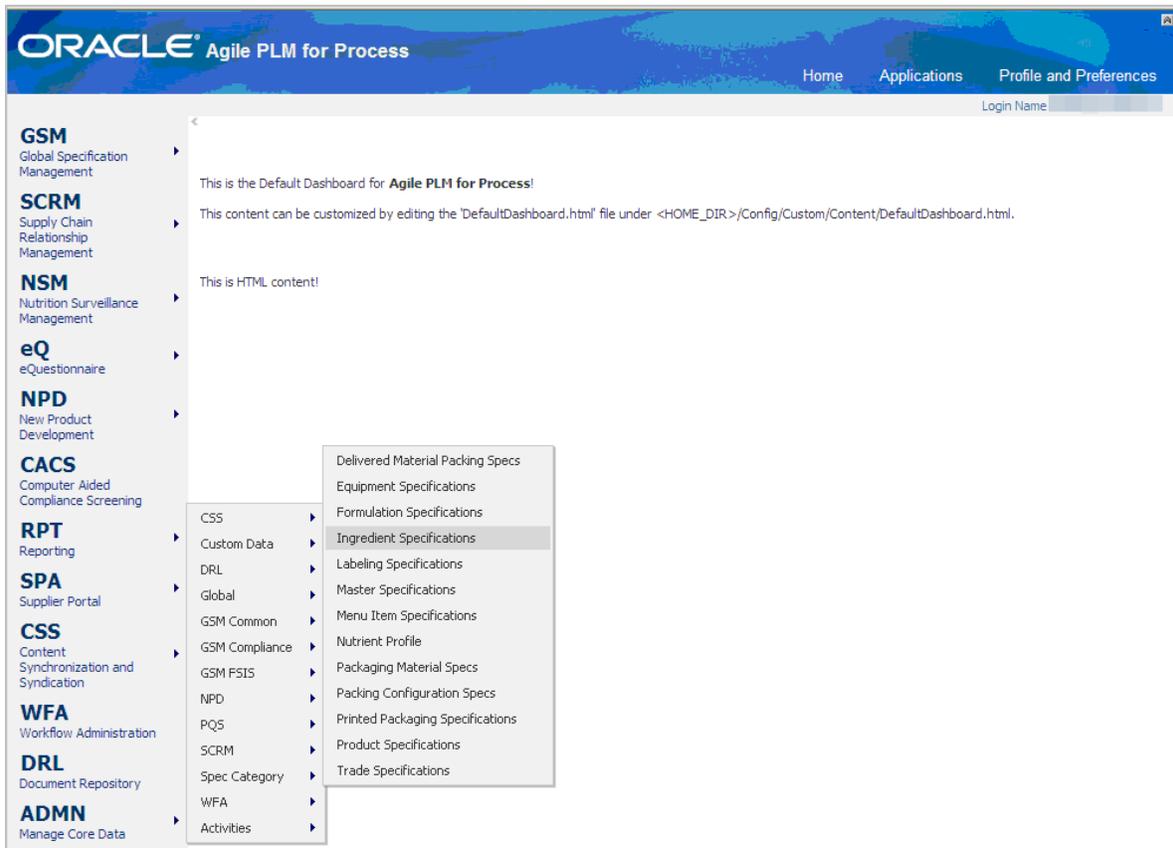
External IDs are assigned to the specification taxonomy in Agile PLM for Process. This allows you to uniquely identify a taxonomy node, which will be used to map these nodes to EBS data. The mapping will take place in the AIA DVM layer. More specifically, the External IDs in Agile PLM for Process category taxonomies for ingredients, packaging, printed packaging and trade Specifications will map to E-Business Suite's Category Set ID and Category ID. The External IDs for formulation, trade and packaging category taxonomies will map to Formula Classifications in OPM. Trade and packaging categories map to both because item and formulas are created from each.

In Agile PLM for Process, customers can load external IDs to a specification taxonomy using the *Data Admin* tool for adding additional IDs of categories based on business requirements. The ID that is loaded should be unique. These values will be the same values used in the DVM mapping..

Note: In Agile PLM for Process, the process to set up external IDs of categories is the same for all specifications (trade, formulation, ingredient, packaging, and printed packaging). Hence, this process is the same for item and recipe.

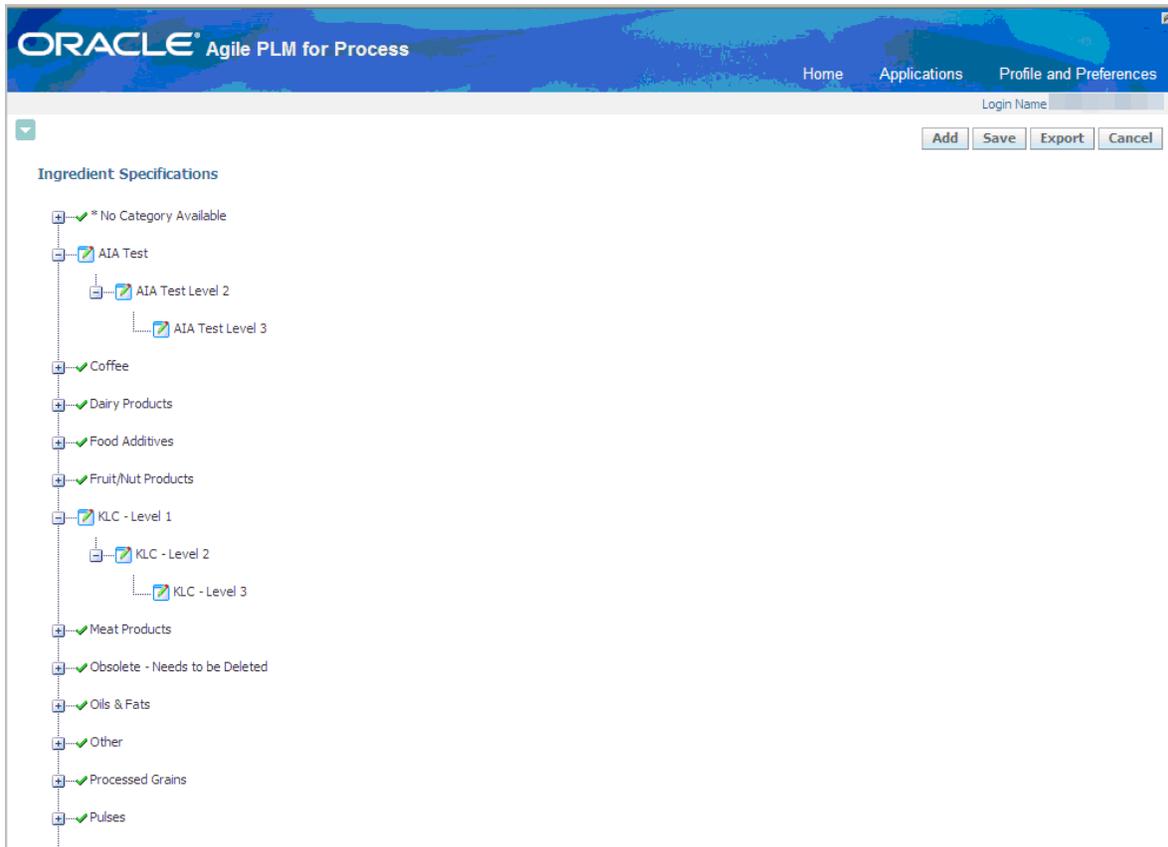
To add an external ID to a specification taxonomy in Agile PLM for Process:

1. From the left navigation panel of the Agile PLM for Process Specification Taxonomy page, select *ADMN > Spec Category > {name of sub-menu}*. The sub-menu names denote the specification taxonomy to which you want to add external IDs.



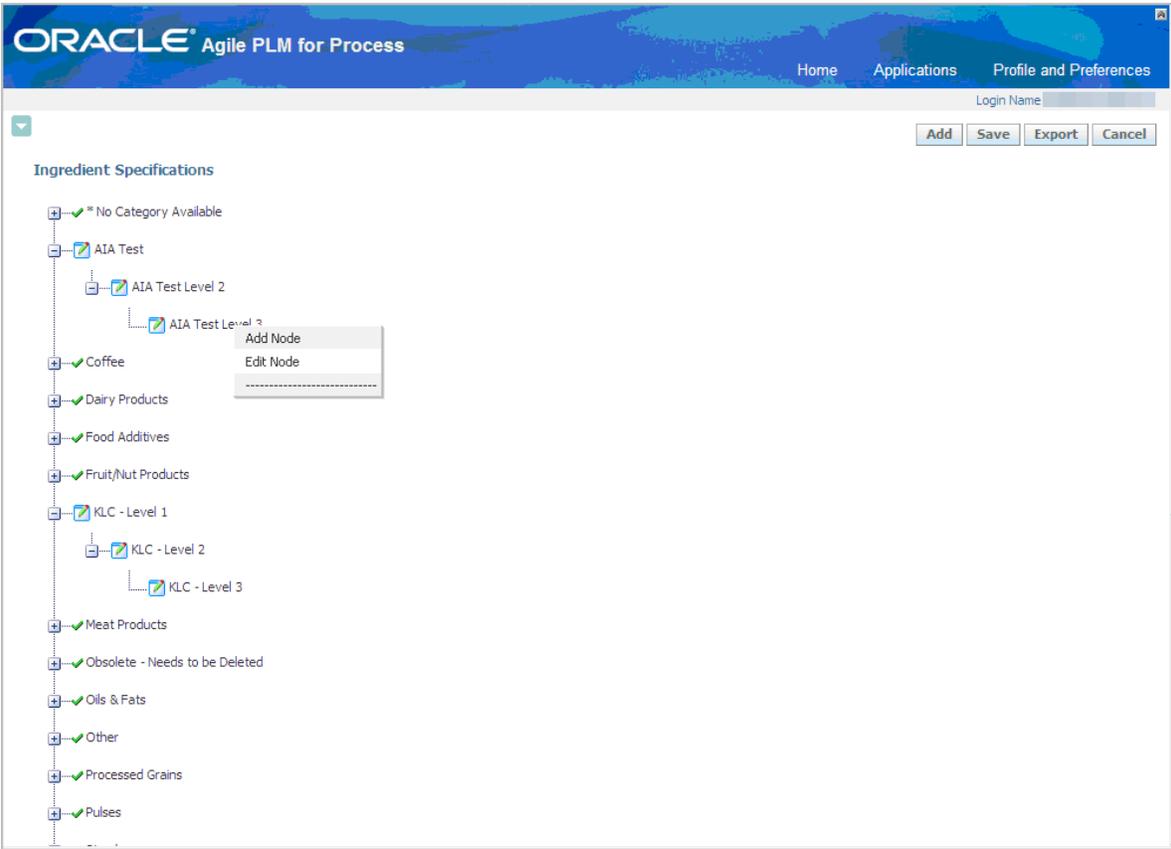
ADMN > Spec Category > Specification taxonomy submenu in Data Admin application, Agile PLM for Process

Agile PLM for Process displays a tree list for editing purposes. The following screen captures illustrate the process of loading external IDs using Ingredient specification taxonomy as an example. This process will be the same for any specification that you want to syndicate.



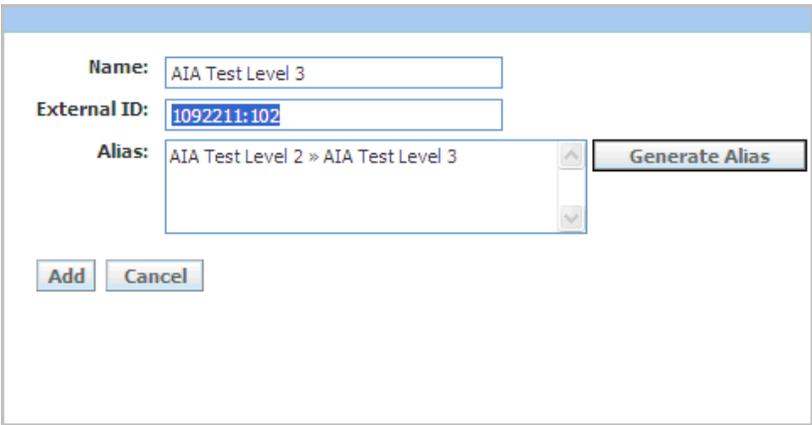
Ingredient specification taxonomy

2. Right-click the node in the tree to which you want to add the external ID and select *Edit Node*.



Edit Node for ingredient specification category

3. The Edit Node dialog box appears with the current node properties.



Edit Node dialog box

- 4. Make the needed changes to the *Name*, *External ID*, and *Alias* fields. Enter the combination of E-Business Suite Category Set and E-Business Category ID separated by a colon in the *External ID* field.
- 5. Click the *Add* button.

6. Repeat steps 2 through 5 for each node to which you want to add an external ID.
7. After all the external IDs have been added, click the *Save* button at the top of the Agile PLM for Process Specification Taxonomy page to store the changes.

Creating Extended Attributes in Agile PLM for Process

Extended attributes are attributes that are set up by the user to handle additional data needs. For example, if the user needs a new field to measure a weight, then extended attributes are used. The following Enterprise Business Object (EBO) attributes are represented as Extended Attributes in Agile PLM for Process:

- ERP_Owner
- ERP_Owning_Org
- IS_ERP_ENGINEERING_ITEM
- Packaging_Height
- Packaging_Length
- Packaging_Width
- Packaging_Volume
- Secondary_UOM

Each extended attribute of Agile PLM for Process that corresponds to one of these values needs to have a tag to facilitate mapping in the Application Integration Architecture (AIA). When this Process Integration Pack (PIP) is installed, these extended attributes and tags need to be created, if they do not exist. These extended attributes must be configured and transported using the Agile PLM for Process Data Admin tool.

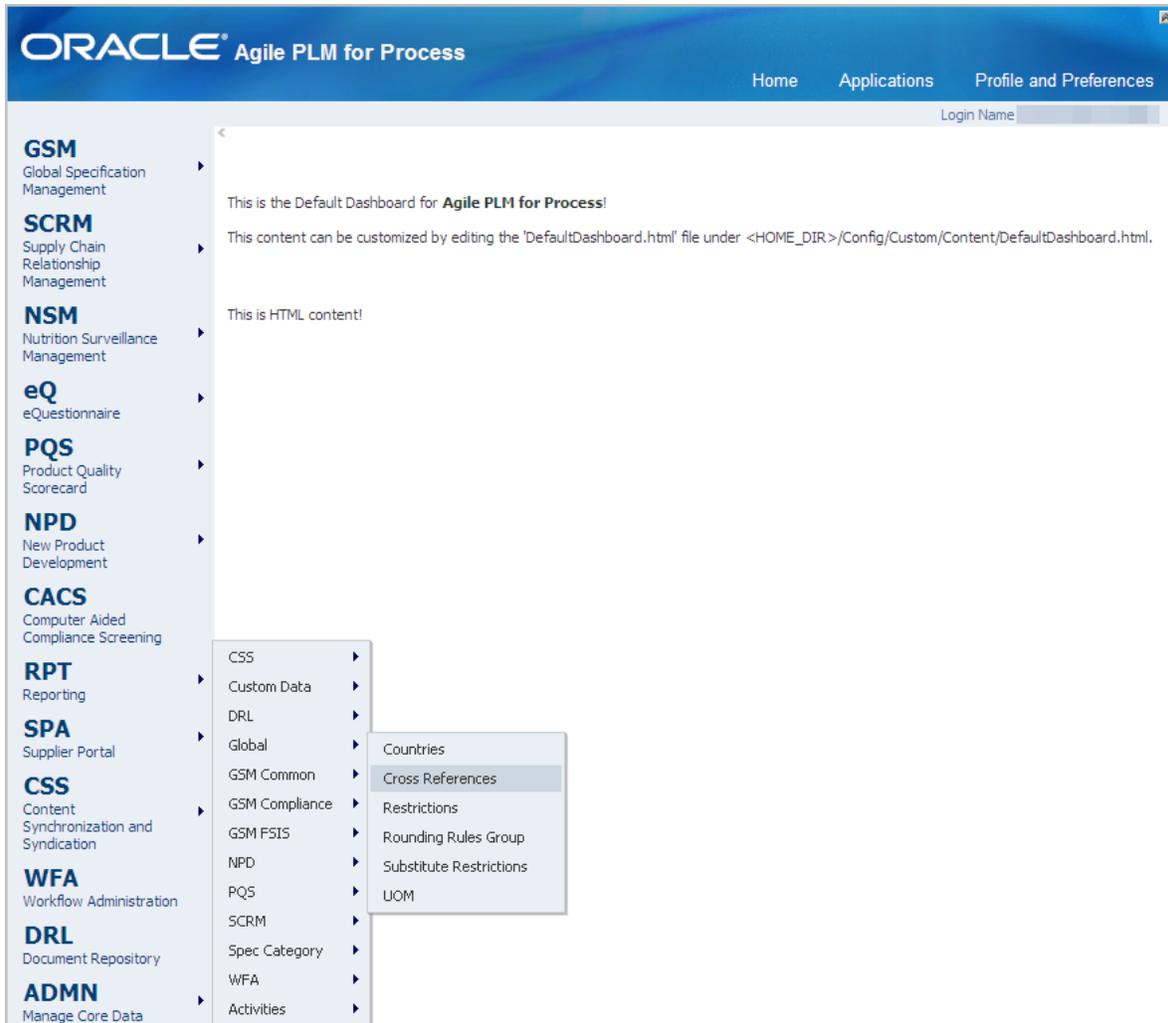
The owning organization extended attribute needs to be created in Agile PLM for Process. If it does not exist in the Content Synchronization and Syndication (CSS) message, a default value is assigned. Creating this Lookup attribute allows the user to specify an owning organization on the ingredient, packaging, printed packaging, formulation, and trade specifications that are part of this PIP.

Creating Cross-Reference Systems in Agile PLM for Process

Cross-references to OPM and EBS Inv should be set up in Agile PLM for Process so that those systems and a corresponding equivalent number can be referenced. The default system codes are: INV-EBIZ_01 and OPM-EBIZ_01. INV-EBIZ_01 points to E-Business Suite's Inventory Management for item syndication and OPM-EBIZ_01 points to E-Business Suite's Oracle Process Manufacturing for formula syndication.

To add a cross-reference system in Agile PLM for Process:

1. From the left navigation panel of the Agile PLM for Process, select **ADMN > Global > Cross References**.



ADMN>Global menu

Agile PLM for Process displays the Cross References page.

The screenshot shows the Oracle Agile PLM for Process web interface. The header includes the Oracle logo and the text "Agile PLM for Process". Navigation links for "Home", "Applications", and "Profile and Preferences" are visible. A "Login Name" field is present. Below the header, there are "Add", "Save", "Export", and "Cancel" buttons. The main content area is titled "Cross References" and contains a table with the following data:

	System Name	System Code	Managed Externally Default	Status
	Archived v52	Archived v52	<input type="checkbox"/>	Archive
	BPCS System	USBPCS	<input type="checkbox"/>	Active
	FS System	TSFS	<input type="checkbox"/>	Active
	Inactive	Inactive	<input type="checkbox"/>	Inactive
	JDE System	USJDE	<input type="checkbox"/>	Active
	Oracle System	USORACLE	<input type="checkbox"/>	Active
	Oracle2 System	2ORCAL	<input type="checkbox"/>	Active
	rc36	rc36	<input type="checkbox"/>	Archive
	SAP System	USSAP	<input checked="" type="checkbox"/>	Active
	US-OPM	US-OPM	<input type="checkbox"/>	Active

Cross References page, Agile PLM for Process

2. With the page in edit mode, click Add. A new row is appended to the table.
3. Complete the following fields:
 - For System Name, enter E-Business Suite's Inventory Management.
 - For System Code, enter INV-EBIZ_01.
 - Check the Managed Externally Default check box. This enables external systems to provide the cross-reference equivalence number. When checked, a GSM user cannot edit the Cross-reference field unless the GSM user has the role of [EXTERNALLY_MANAGED_CROSS_REF_ADMIN]. This field may not display based on configuration settings.
 - For Status, select Active.
4. Click the apply changes icon ().
5. Click Save. You have now added a cross-reference to E-Business Suite's Inventory Management system.
6. Repeat steps 2 through 5, adding E-Business Suite's Oracle Process Manufacturing as the System Name, and OPM-EBIZ_01 as the System Code.

Working with DVMs

Domain Value Maps (DVM) templates are XML files that conform to the Oracle SOA Suite DVM schema. The DVMs are stored in Metadata Service (MDS). A composer application is used to update DVM modifications. Domain values are used for static lookups.

An E-Business Suite item template is created prior to the implementation so that it can be used to create items in E-Business Suite. One such template will be seeded as part of this Process Integration Pack (PIP). Customers can copy and create more templates to default the attributes for various specification types, if required. The value for the following fields must be set by the customer in the item template for the item creation to be successful; these attributes are not set by default in the seeded item template:

- PURCHASING_ITEM_FLAG
- SHIPPABLE_ITEM_FLAG
- CUSTOMER_ORDER_FLAG
- INTERNAL_ORDER_FLAG
- PURCHASING_ENABLED_FLAG
- CUSTOMER_ORDER_ENABLED_FLAGINTERNAL_ORDER_ENABLED_FLAGSO_TRANSACTIONS_FLAG
- INVOICEABLE_ITEM_FLAG
- INVOICE_ENABLED_FLAG

A DVM is used to map the specification type and item template. Using the information in DVM, appropriate item templates are used and passed to the item creation API for each specification type. The customer should set the default secondary attribute in the item template appropriately during the implementation. Failing to do so may result in failure of item creation in E-Business Suite, for cases where unit of measure (UOM) tracking is set to both primary and secondary attributes.

List of DVMs

These tables list the details of Domain Value Mappings (DVMs) for raw materials/items and recipes in Agile PLM for Process and Oracle E-Business Suite:

Item DVMs in Agile PLM for Process

DVM Name	Description	ABM Xpath
ITEM_CATEGORY	Used to Map the Item Category in PLM4P to the Category Set ID and Category ID in E-Business Suite. The External ID field is used to map this field in PLM4P.	Specification/category/specTaxonomy/code
ITEM_UOM_CODE	Used to map from Agile PLM for Process specification UOM to E-Business Suite item UOM	<ul style="list-style-type: none"> • Specification Base UOM: Specification/AvailableUOMs/BaseUOM • Trade Specification Base UOM: AIA configuration property: Trade.Spec.Default.UOM • Specification Secondary UOM:

DVM Name	Description	ABM Xpath
		Derived ISO code from DVM PLM4P_UOM_ISOCODE <ul style="list-style-type: none"> Packaging characters: Extended Attributes UOM UOM Conversions: From & To UOM
LANGUAGE_CODE	Used to map from Agile PLM for Process message language code to E-Business Suite message language code	Envelope/body/transaction/syndicationCommand/content/@language
PLM4P_UOM_ISOCODE	Used for Agile PLM for Process only to transform from UOM name to UOM ISO code	Specification/extendedAttributes/extendedAttribute[uppercase(itemListAttribute/tags/tag) = 'SECONDARY_UOM']/itemListAttribute/item/name

Item DVMs in E-Business Suite

DVM Name	Description	ABM Xpath
EBIZ_PLM4P_APPS_USER	Used to map the user corresponding to the integration language	Used for initializing the apps context - Username
ITEM_BILLING_TYPE_CODE	Used to map the BillingTypeCode of an item	Used for E-Business Suite Item attribute - ITEM_OBJ/SERVICE_OBJ_TYPE/MATERIAL_BILLABLE_FLAG
ITEM_BOM_ITEMTYPE_CODE	Used to map the BOMItemTypeCode	Used for E-Business Suite Item attribute - ITEM_OBJ/BOM_OBJ_TYPE/BOM_ITEM_TYPE
ITEM_CONSIGNMENT_ITEM_INDICATOR	Used to map the ConsignmentItemIndicator that shows if the item is consigned or not	Used for E-Business Suite Item attribute - ITEM_OBJ/GPLANNING_OBJ_TYPE/CONSIGNMENT_FLAG
ITEM_CONTRACT_TYPE_CODE	Used to map ContractTypeCode of an item	Used for E-Business Suite Item attribute - ITEM_OBJ/ASSET_OBJ_TYPE/CONTRACT_ITEM_TYPE_CODE
ITEM_CREATE_FIXED_ASSET_INDICATOR	Used to map the CreateFixedAssetIndicator of an item	Used for E-Business Suite Item attribute - ITEM_OBJ/SERVICE_OBJ_TYPE/ASSET_CREATION_CODE
ITEM_DUAL_UOM_TRACKING_INDICATOR	Used to map the DualUOMTrackingIndicator value of an item	Used for E-Business Suite Item attribute - ITEM_OBJ/MAIN_OBJ_TYPE/TRACKING_QUANTITY_IND
ITEM_EFFECTIVITY_CONTROL_CODE	Used to map the EffectivityControlCode of an item	Used for E-Business Suite Item attribute - ITEM_OBJ/BOM_OBJ_TYPE/EFFECTIVITY_CONTROL

DVM Name	Description	ABM Xpath
ITEM_ENTITY_TO_TEMPLATE	Used to map the template based on different entity types such as Ingredient, Packaging, Printed Packaging, and Trade specifications	Used for E-Business Suite Item attribute - ITEM_OBJ/ MAIN_OBJ_TYPE /TEMPLATE_NAME
ITEM_INVENTORY_PLANNING_CODE	Used to map the InventoryPlanningCode of an item	Used for E-Business Suite Item attribute - ITEM_OBJ/GPLANNING_OBJ_TYPE/INVENTORY_PLANNING_CODE
ITEM_MAKEORBUY_CODE	Used to map the MakeOrBuyCode of an item	Used for E-Business Suite Item attribute – ITEM_OBJ/ GPLANNING_OBJ_TYPE/PLANNING_MAKE_BUY_CODE
ITEM_PRIMARYCLASSIFICATIONCODE	Used to map the PrimaryClassificationCode of an item	Used for E-Business Suite Item attribute - ITEM_OBJ/ MAIN_OBJ_TYPE / ITEM_CATALOG_GROUP_CODE
ITEM_RECEIVING_ROUTING_CODE	Used to map the ReceivingRoutingCode of an item	Used for E-Business Suite Item attribute - ITEM_OBJ/ RECEIVING_OBJ_TYPE / RECEIVING_ROUTING_ID
ITEM_REPLENISHMENT_SOURCE_CODE	Used to map the ReplenishmentSourceCode of an item	Used for E-Business Suite Item attribute - ITEM_OBJ/ GPLANNING_OBJ_TYPE / SOURCE_TYPE
ITEM_RESERVATION_ALLOWED_INDICATOR	Used to map the ReservationAllowedIndicator of an item	Used for E-Business Suite Item attribute - ITEM_OBJ/ INVENTORY_OBJ_TYPE / RESERVABLE_TYPE
ITEM_SERIALIZATION_EVENT_CODE	Used to map the SerializationEventCode of an item	Used for E-Business Suite Item attribute - ITEM_OBJ/INVENTORY_OBJ_TYPE/ SERIAL_NUMBER_CONTROL_CODE
ITEM_STATUS_CODE	Used to map the ItemStatusCode	Used for E-Business Suite Item attribute - ITEM_OBJ/ MAIN_OBJ_TYPE / INVENTORY_ITEM_STATUS_CODE
ITEM_TYPE	Used to map the item type specific to participating applications	ITEM_OBJ/ MAIN_OBJ_TYPE / ITEM_TYPE
ITEM_UOM_CODE	Used to map the UOM code of an item specific to the provider application	Used for E-Business Suite Item attribute - ITEM_OBJ/ PHYSICAL_OBJ_TYPE / WEIGHT_UOM_CODE, ITEM_OBJ/ PHYSICAL_OBJ_TYPE / VOLUME_UOM_CODE, ITEM_OBJ/ PHYSICAL_OBJ_TYPE / DIMENSION_UOM_CODE
ITEM_UOM_CONVERSION_USAGE_CODE	Used to map the UOMConversionUsageCode of an item	Used for E-Business Suite Item attribute - ITEM_OBJ/ MAIN_OBJ_TYPE / ALLOWED_UNITS_LOOKUP_CODE

DVM Name	Description	ABM Xpath
ITEM_WIP_SUPPLY_CODE	Used to map the WIPSupplyTypeCode of an item	Used for E-Business Suite Item attribute - ITEM_OBJ/ WIP_OBJ_TYPE / WIP_SUPPLY_TYPE
LANGUAGE_CODE	Used to map the language codes specific to participating applications	Used for initializing the apps context

Recipe DVMs in Agile PLM for Process

DVM Name	Description	ABM Xpath
ITEMFORMULA_CLASSIFICATION_CODE	Used to map from PLM4P specification category to E-Business Suite formula class code. In PLM4P, the External ID field of the category is used for the mapping.	Specification/Category/specTaxonomy/Code
ITEMFORMULA_TYPE_CODE	Used to map from PLM4P specification type to E-Business Suite formula type code	Specification/SpecType
ITEMFORMULAMATERIAL_BY_PRODUCT_TYPE_CODE	Used to map from PLM4P formulation specification BOM item output type (By-Product or Waste) to E-Business Suite by-product type code	FormulationSpecification/specificationFormulation/outputs/output/outputType
ITEMFORMULAMATERIAL_QUANTITYCONTRIBUTOR_INDICATOR	Used to indicate a PLM4P formulation specification BOM input item whether contributes to the step quantity or not	FormulationSpecification/extension/FormulationExtension/Formulation/Steps/Step/Inputs/Input/MaterialIdentity/SpecType
ITEMFORMULAMATERIAL_TYPE_CODE	Used to indicate a PLM4P formulation specification BOM input or output item type as an E-Business Suite item formula material type code	
ITEMFORMULAMATERIAL_YIELDCONTRIBUTOR_INDICATOR	Used to indicate a PLM4P formulation specification BOM input item whether contributes to yield or not	FormulationSpecification/extension/FormulationExtension/Formulation/Steps/Step/Inputs/Input/MaterialIdentity/SpecType
LANGUAGE_CODE	Used to map from PLM4P message language code to E-Business Suite message language code	Envelope/body/transaction/syndicationCommand/content/@language
PLM4P_OUTPUT_TYPE_CODE	An assistant DVM table used by PLM4P only to help transfer 4 item types to 2 E-Business Suite related type code	FormulationSpecification/specificationFormulation/outputs/output/outputType

DVM Name	Description	ABM Xpath
STATUS_TYPE_CODE	Used to map from PLM4P specification status to E-Business Suite formula status	Specification/SpecStatus
UNIT_OF_MEASURE	Used to map from PLM4P specification BOM item quantity UOM to E-Business Suite formula item material quantity UOM	

Recipe DVMs in E-Business Suite

DVM Name	Description	ABM Xpath
EBIZ_PLM4P_APPS_USER	Used to map the user corresponding to the integration language	Used for initializing the apps context - Username
ITEMFORMULA_ACTIVE_INDICATOR	Used to map the active indicator that shows whether the formula is active	Used for E-Business Suite Recipe attribute - P_RECIPE_TBL/P_RECIPE_TBL_ITEM /FORMULA_OBJ/FORMULA_HEADER/ INACTIVE_IND
ITEMFORMULA_CLASSIFICATION_CODE	Used to map the formula class	Used for E-Business Suite Recipe attribute - P_RECIPE_TBL/P_RECIPE_TBL_ITEM /FORMULA_OBJ/FORMULA_HEADER/ FORMULA_CLASS
ITEMFORMULA_SCALABILITY_INDICATOR	Used to map the scalable indicator of the formula	Used for E-Business Suite Recipe attribute - P_RECIPE_TBL/P_RECIPE_TBL_ITEM /FORMULA_OBJ/FORMULA_HEADER/ SCALE_TYPE_HDR
ITEMFORMULA_TYPE_CODE	Used to map the item formula type such as packaging or standard	Used for E-Business Suite Recipe attribute - P_RECIPE_TBL/P_RECIPE_TBL_ITEM /FORMULA_OBJ/FORMULA_HEADER/ FORMULA_TYPE
ITEMFORMULAMATERIAL_BYPRODUCT_TYPE_CODE	Used to map the by-product types in the formula	Used for E-Business Suite Recipe attribute - P_RECIPE_TBL/P_RECIPE_TBL_ITEM /FORMULA_OBJ/FORMULA_DETAILS/ BY_PRODUCT_TYPE
ITEMFORMULAMATERIAL_PHANTOMTYPE_CODE	Used to map the formula material phantom types	Used for E-Business Suite Recipe attribute - P_RECIPE_TBL/P_RECIPE_TBL_ITEM /FORMULA_OBJ/FORMULA_DETAILS/ PHANTOM_TYPE

DVM Name	Description	ABM Xpath
ITEMFORMULAMATERIAL_QUANTITYCONTRIBUTOR_INDICATOR	Used to map the contribute-to-quantity flag	Used for E-Business Suite Recipe attribute - P_RECIPE_TBL/P_RECIPE_TBL_ITEM /FORMULA_OBJ/FORMULA_DETAILS/CONTRIBUTE_STEP_QTY_IND
ITEMFORMULAMATERIAL_RELEASESETYPE_CODE	Used to map the formula material release type	Used for E-Business Suite Recipe attribute - P_RECIPE_TBL/P_RECIPE_TBL_ITEM /FORMULA_OBJ/FORMULA_DETAILS/RELEASE_TYPE
ITEMFORMULAMATERIAL_SCALETYPE_CODE	Used to map the formula material scale type code	Used for E-Business Suite Recipe attribute - P_RECIPE_TBL/P_RECIPE_TBL_ITEM /FORMULA_OBJ/FORMULA_DETAILS/SCALE_TYPE_DTL
ITEMFORMULAMATERIAL_TYPE_CODE	Used to map the formula material types	Used for E-Business Suite Recipe attribute - P_RECIPE_TBL/P_RECIPE_TBL_ITEM /FORMULA_OBJ/FORMULA_DETAILS/LINE_TYPE
ITEMFORMULAMATERIAL_YIELDCONTRIBUTOR_INDICATOR	Used to map the contribute-to-yield indicator	Used for E-Business Suite Recipe attribute - P_RECIPE_TBL/P_RECIPE_TBL_ITEM /FORMULA_OBJ/FORMULA_DETAILS/CONTRIBUTE_YIELD_IND
LANGUAGE_CODE	Used to map the language codes specific to participating applications	FND language code
UNIT_OF_MEASURE	Used to map the unit of measures for the items used	Used for E-Business Suite Recipe attribute - P_RECIPE_TBL/P_RECIPE_TBL_ITEM /FORMULA_OBJ/FORMULA_DETAILS/DETAIL_UOM

Working with AIA Cross-References

AIA cross-references, not to be confused with PLM for Process cross-references, map and connect the records within the application network, and they enable these applications to communicate in the same language. The integration server stores the relationship so that others can refer to it.

This PIP maintains and uses the cross-reference data between Agile PLM for Process and Oracle E-Business Suite objects (such as Items) in the middle tier.

The following table lists the details of the Item_ID, Formula_ID, and ItemFormulaMaterial_ID:

Name	Purpose	Columns Used	Mapping Description
ITEM_ITEMID	Create or Update	EBIZ_01, COMMON, PLM4P_01	<p>Cross-reference is based on Specification number from Agile PLM for Process and Item_ID from Oracle E-Business Suite.</p> <p>From E-Business Suite side, the Item xref value is of this format: Inventory_Item_ID::Organization_ID::Operating_Unit_ID</p>
ITEMFORMULA_ID	Create or Update	EBIZ_01, COMMON, PLM4P_01	<p>Cross-reference is based on Specification number or Issue number from Agile PLM for Process and Formula_ID from Oracle E-Business Suite. From E-Business Suite side, Formula_ID is stored in the cross-reference.</p>
ITEMFORMULAMATERIAL_ID	Create or Update	EBIZ_01, COMMON, PLM4P_01	<p>Cross-reference is based on Specification number from Agile PLM for Process and Formula Material ID from Oracle E-Business Suite. These are the conditions:</p> <ul style="list-style-type: none"> • For packaging specification BOM items, the cross-reference is based on parent specification number, parent issue number, specification number, and issue number. • For trade specification BOM items, the cross-reference is based on parent specification number, parent issue number, specification number, issue number, and BOM item type (lower-level trade item, packaging sub-components, or ingredient). • For formulation specification BOM items, the cross-reference is based on parent specification number, parent issue number, specification number, issue number, step number, and sequence number (not applicable to output items).
MANUFACTURINGROUTING_ID	Create or Update	EBIZ_01, COMMON, PLM4P_01	<p>Cross-reference is based on Formulation Specification name from Agile PLM for Process as the EBS message ManufacturingRouting Business Components ID. Used by Agile PLM for Process only.</p>
PRODUCTIONRECIPE_ID	Create or Update	EBIZ_01, COMMON, PLM4P_01	<p>Cross-reference is based on Specification name from Agile PLM for Process as the EBS message ItemFormula Business Components ID. Used by Agile PLM for Process only.</p>

Handling Errors

Based on the roles defined for the services, email notifications are sent if an error occurs. The roles can be assigned at various levels in a hierarchy (service, process, domain) so that when a service errors out, the Error Handling Framework uses the role value to derive the users who have to be notified. The Error Handling Framework then notifies the users using their preferred notification method, puts the error in the user's Oracle Worklist, and puts the error in the error log.

For more information about configuring error notifications, see *Oracle Fusion Middleware Infrastructure Components and Utilities User's Guide for Oracle Application Integration Architecture Foundation Pack*, "Setting Up Error Handling".

In case of any processing failure within E-Business Suite, appropriate error messages are logged and propagated back to Agile PLM for Process. The Agile PLM for Process application receives these messages and takes appropriate actions. For example, it could invoke a notification service and send notification to the appropriate people or in other cases, update relevant status within Agile PLM for Process. The Agile PLM for Process reconciler understands the response message and processes them back to the publication. AIA error notifications are sent to users such as administrators, or to a distribution list.

For more information about the errors thrown by the applications - Agile PLM for Process and Oracle E-Business Suite, see *Oracle Fusion Middleware Developer's Guide for Oracle Application Integration Architecture Foundation Pack*.

Troubleshooting

The following issues are addressed in this chapter:

1. Issue: Syndication failed with “INV_IOI_ERR” error

Solution:

Truncate the following E-Business Suite interface tables and verify. Ensure that there are no pending records in these tables for processing in E-Business Suite.

```
TRUNCATE TABLE INV.MTL_SYSTEM_ITEMS_INTERFACE;
```

```
TRUNCATE TABLE INV.MTL_INTERFACE_ERRORS;
```

```
TRUNCATE TABLE INV.MTL_ITEM_REVISIONS_INTERFACE;
```

```
TRUNCATE TABLE INV.MTL_ITEM_CATEGORIES_INTERFACE;
```

2. Issue: While syndicating packaging specification with BOM, syndication fails with error “The source value for source column "PLM4P_01" in dvm "oramds:/apps/AIAMetaData/dvm/UNIT_OF_MEASURE.dvm" cannot be NULL or EMPTY.”

Solution: Check if Base UOM is entered in Agile PLM for Process. Base UOM is required if the packaging specification has BOM.

3. Issue: While syndicating packaging specification, syndication failed with error “Item not found. Invalid item. Please re-enter.”

Solution: Check if Base UOM is entered in Agile PLM for Process. Base UOM is mandatory if the packaging specification has TareWeight.

4. Issue: Syndication failed with error

```
“ora:processXSLT('xsl/XformSyncRecipeListEBM_to_SyncRecipeListABM.xml',bpws:getVariableData('SyncProductionRecipeListEBM','SyncProductionRecipeListEBM'),bpws:getVariableData('XSLTParams')).
```

The XPath expression failed to run; the reason was: javax.xml.transform.TransformerException: <Line 304, Column 309>: XML-22044: (Error) Extension function error: Error invoking 'lookupXRef':oracle.tip.xref.exception.ValidationException: Reference value is empty for Reference Column Name "COMMON" and for Table Name "oramds:/apps/AIAMetaData/xref/ITEMFORMULAMATERIAL_ID.xref" Please ensure Reference value is non-empty'. Check the detailed root cause described in the exception message text and verify that the XPath query is correct”

Solution: Check if the ingredients are already synchronized. The ingredients must be syndicated first, before syndicating the formula.

5. Issue: Ingredient and packaging syndication failed due to change in item template values with the error message of "Entity Id: ITEM Message Text: Secondary UOM and Defaulting are mandatory if Pricing or Tracking is not Primary. , Entity Id: ITEM Message Text: Secondary UOM and Defaulting are mandatory if Pricing or Tracking is not Primary. , Entity Id: ITEM Message Text: ART_DATE_ACTIVE or END_DATE_ACTIVE column values will be ignored, since Item effectivity is based only on Item Status code. , Entity Id: ITEM Message Text: START_DATE_ACTIVE or END_DATE_ACTIVE column values will be ignored, since Item effectivity is based only on Item Status code"

Solution: Check if Secondary UOM is added or not. If the item template that is used has 'Tracking UOM Indicator' set as 'Primary & Secondary', then Secondary UOM is a mandatory field.

6. Issue: Err Msg: Entity Id: ITEM Message Text: Dimension UOM code not specified for dimension units

Solution: The width measure field value is sent to E-Business Suite, though there is no value sent for dimension UOM. This may be due to wrong setup in the Item template that is used in the syndication.

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