Oracle® Application Integration Architecture

Oracle Design to Release Integration Pack for Agile Product Lifecycle Management for Process and Oracle Process Manufacturing Release Notes

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Contents

Contents 3

Oracle Design-to-Release Integration Pack for Agile Product Lifecycle Management for Process and Oracle Process Manufacturing 3.1.1 Overview 5

Product Features for Oracle Design-to-Release Integration Pack for Agile Product Lifecycle Management for Process and Oracle Process Manufacturing 3.1.1 7

- Raw Material Introduction and Update 10
- Formula/Recipe Creation and Update 11
- Finished Goods Introduction and Update 13

Participating Application Enhancements 15

Foundation Pack Enhancements 16

Additional Resources 17

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Oracle Design-to-Release Integration Pack for Agile Product Lifecycle Management for Process and Oracle Process Manufacturing 3.1.1 Overview

This document provides an overview of the value proposition for the Design-to-Release Integration pack for Agile Product Lifecycle Management (PLM) for Process and Oracle Process Manufacturing (OPM) 3.1.1. It is a roadmap intended to help you assess the business benefits of the Integration Pack and plan your information technology (IT) projects and investments. Our goal is to help you leverage technology to its fullest and increase the efficiency and effectiveness of your operations.

Process industries face many business challenges in their product development environment such as shorter product life, increased product complexity, and more competition for innovation, cost, quality, and time. As a result, these pressures can hinder collaboration between two core domains: product innovation and manufacturing execution.

The Design-to-Release Process Integration Pack (PIP) combines Agile's robust project and portfolio management, specification management, formulation, and labeling capabilities with E-Business Suite's robust planning, procurement, and process manufacturing capabilities, providing a common framework that supports product conception through manufacturing. The integration of Agile PLM for Process and E-Business Suite Process Manufacturing streamlines the Design-to-Release business process and allows raw materials, products, and formulas that are defined and approved in PLM to automatically flow to the Enterprise Resource Planning (ERP) system.

Key features of this PIP include:

- Synchronized raw materials, formulas and finished goods information with traceability between the Agile PLM for Process and E-Business Suite Inventory and Process Manufacturing applications
- A flexible workflow process to allow administrative and user control over syndication
- Adaptable and extendable solution to meet your design-to-release business requirements

Key benefits of this integration include:

- Improved product time-to-market
    - Ensure on-time Enterprise Resource Planning (ERP) access to data with Product Lifecycle Management's (PLM) workflow-driven syndication capabilities
    - Start planning, procurement and manufacturing activities as soon as possible
    - Ensure formula readiness through Bill of Material (BOM) dependency checking
- Lower corporate risk and costs
    - Remove redundant error-prone manual data entry
    - Ensure product compliance before manufacturing resulting in less rework
    - Leverage current processes and interfaces in Agile PLM for Process, Oracle Inventory, and Oracle Process Manufacturing

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- Out-of-the-box support for integration between the PLM and ERP environments
  - Eliminate need for complex custom integration solutions
  - Reduce Total Cost of Ownership (TCO)

Oracle Application Integration Architecture (AIA) replaces traditional enterprise application integration with flexible, pre-built, standards-based business process integration solutions. As an AIA offering, the Design-to-Release Process Integration Pack includes all the necessary business process models, canonical objects, and Web services you need out-of-the-box. Now you can quickly orchestrate a sustainable design-to-release business process across Agile PLM for Process and Oracle E-Business Suite with reduced cost and risk. Plus, the AIA adaptable framework enables you to extend the integration to accommodate your specific business needs.

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Product Features for Oracle Design-to-Release Integration Pack for Agile Product Lifecycle Management for Process and Oracle Process Manufacturing 3.1.1

This section discusses the Design-to-Release business process and integration flows and new features for the Oracle Design-to-Release Integration Pack for Agile Product Lifecycle Management for Process and Oracle Process Manufacturing.

The following are the application versions that are certified for use with this release:

- Agile PLM for Process 6.0.0.3 and Oracle E-Business Suite 12.1.2

Design-to-Release Business Process Flow

This PIP supports the Design-to-Release business process, allowing customers to manage their product portfolios, design, and formulate new products within PLM for Process, and transfer the necessary data to the E-Business Suite for planning, procurement, site-specific formulations, lot-level optimization, testing, and preliminary and final production.

This diagram shows the design-to-release business process flow:

Design-to-Release Business Process

This Design-to-Release integration process synchronizes products, recipes, and raw materials from the Agile PLM for Process system to Oracle Inventory and Oracle Process Manufacturing applications within the E-Business Suite. It focuses on the reference data synchronization and validation for the initial load prior to implementation and incremental data creation and maintenance after implementation.

For added configurability, extensibility, and sustainability, this integration has been built on the Application Integration Architecture Foundation Pack methodology and architecture, giving customers a standards-based, best-practice design-to-release business process.

Process Integration Flows within the PIP

The Oracle Design-to-Release Integration Pack for Agile PLM for Process to Oracle Process Manufacturing 3.1.1 supports the following functional flows:

- Raw Material introduction and update
- Formula/Recipe creation and update
- Finished Good introduction and update

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The Oracle Design-to-Release Integration Pack for Agile PLM for Process to Oracle Process Manufacturing 3.1.1 provides the following integration points:

- Create Item
- Update Item
- Create Formula
- Update Formula

The Oracle Design-to-Release Integration Pack for Agile PLM for Process to Oracle Process Manufacturing 3.1.1 uses the following Enterprise Business Objects (EBO):

- Item EBO
- ProductionRecipe EBO including ItemFormula and ManufacturingRouting

Rather than a point-to-point integration between Agile PLM for Process and Oracle E-Business Suite, the AIA layer serves as a transformation and mediation layer between the applications. As a part of the integration, the Agile PLM for Process' Content Synchronization and Syndication (CSS) application publishes, or syndicates, a subset of Global Specification Management (GSM) specification data (e.g., raw materials, recipes, and products) to the AIA layer, and the AIA layer delivers the information to the E-Business Suite. The AIA layer performs message filtering, message transformation, and message routing. Additionally, it separates the participating applications from one another, so that separate upgrade cycles may be utilized.

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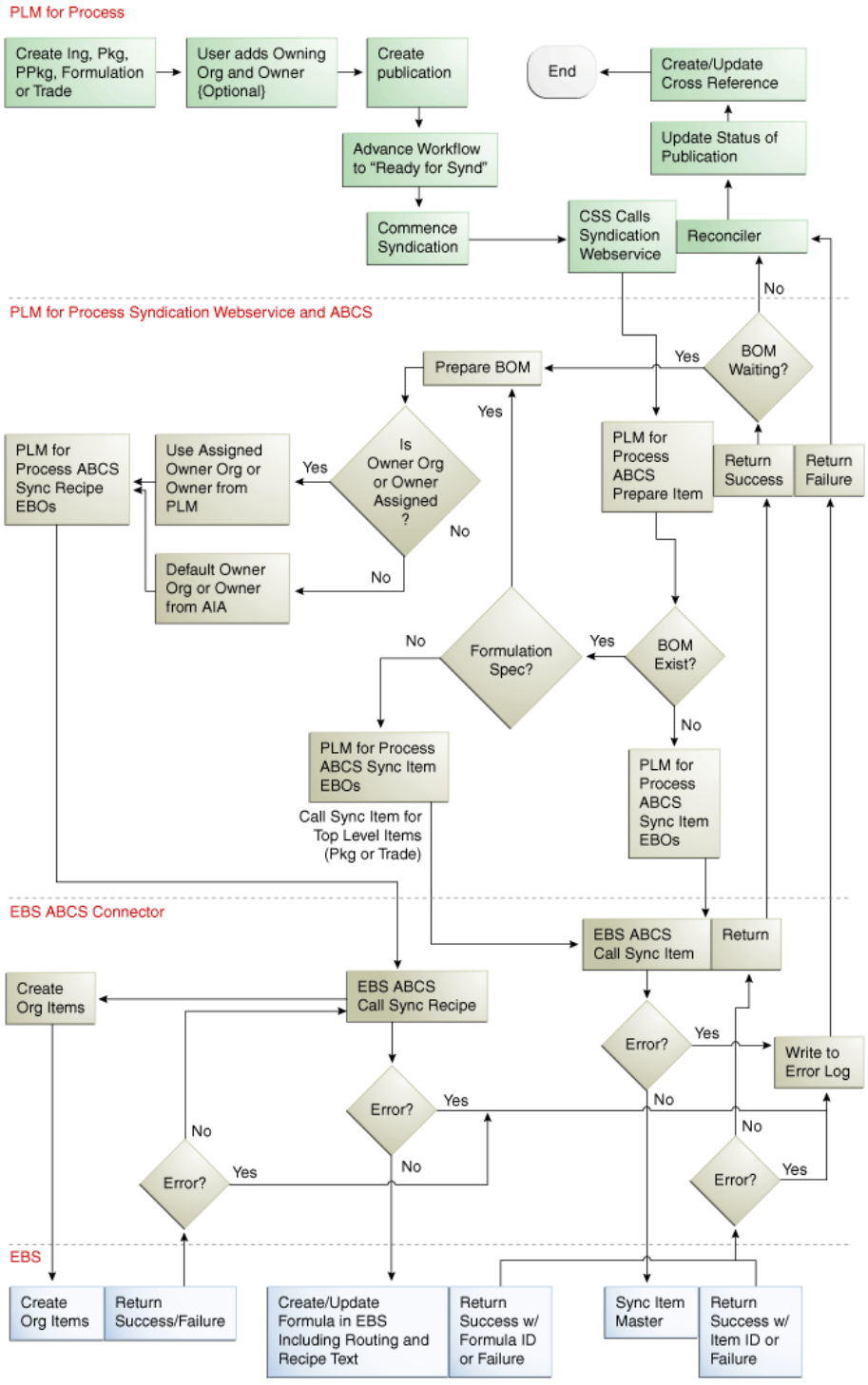
This diagram illustrates the overall integration process flow of raw materials, recipes, and finished goods from Agile PLM for Process to Oracle E-Business Suite (EBS):



Overall Integration Process Flow of Raw Materials, Recipes, and Finished Goods

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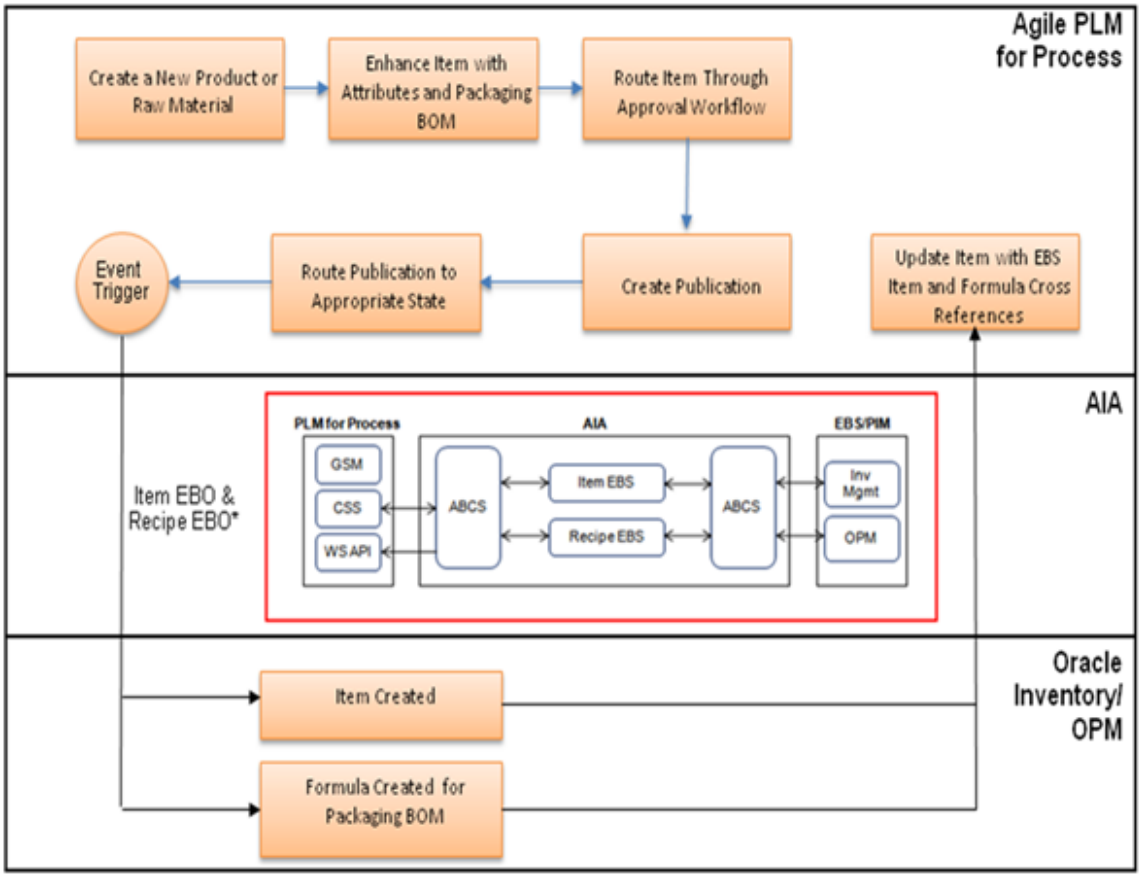
Raw Material Introduction and Update

This feature allows Product Development organizations to define raw materials such as ingredients and packaging within PLM for Process and syndicate the appropriate data to E-Business Suite Inventory and Process Manufacturing for procurement, planning, and production activities.

While defining raw materials users can communicate directly with suppliers using PLM for Process' supplier collaboration tools, leading to more accurate and complete specifications, which in turn lead to better downstream procurement and receiving practices.

The raw material syndication process can be configured to be a mandatory step in the PLM approval workflow process, therefore ensuring consistent and on-time syndication of the appropriate data. This allows planning and procurement access to the data when they need it to ensure they meet the production demands.

The following diagram illustrates the raw material syndication process for this PIP:



*Recipe EBO contains Formula and Routing components

Raw Material Syndication Process Flow

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As a product developer for a food and beverage company, you might work on a new formula, which needs a raw material such as an ingredient or a packaging or printed packaging 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.

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 its 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 Inventory in the 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 formula 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 is created in E-Business Suite.

Formula/Recipe Creation and Update

This feature allows Product Development organizations to define recipes (formulation specifications) within PLM for Process and syndicate the appropriate data to E-Business Suite Process Manufacturing for manufacturing ramp-up and production activities.

The syndication process can be configured to be a mandatory step in the PLM approval workflow process, therefore ensuring consistent and on-time transfer of the appropriate data. Integrity checks are also performed during formula syndication ensuring that the dependent BOM items have been previously sent, eliminating last minute manufacturing problems. These features allow manufacturing access to the right data when they need it.

Since the slow, error-prone method of manually entering the formula into OPM has been eliminated, the accuracy of the data driving the manufacturing and testing processes is more accurate, thereby decreasing the amount of rework, and lowering the risk of compliance issues due to errors. This streamlined automation of data will lower costs, improve time to market, and help protect the brand.

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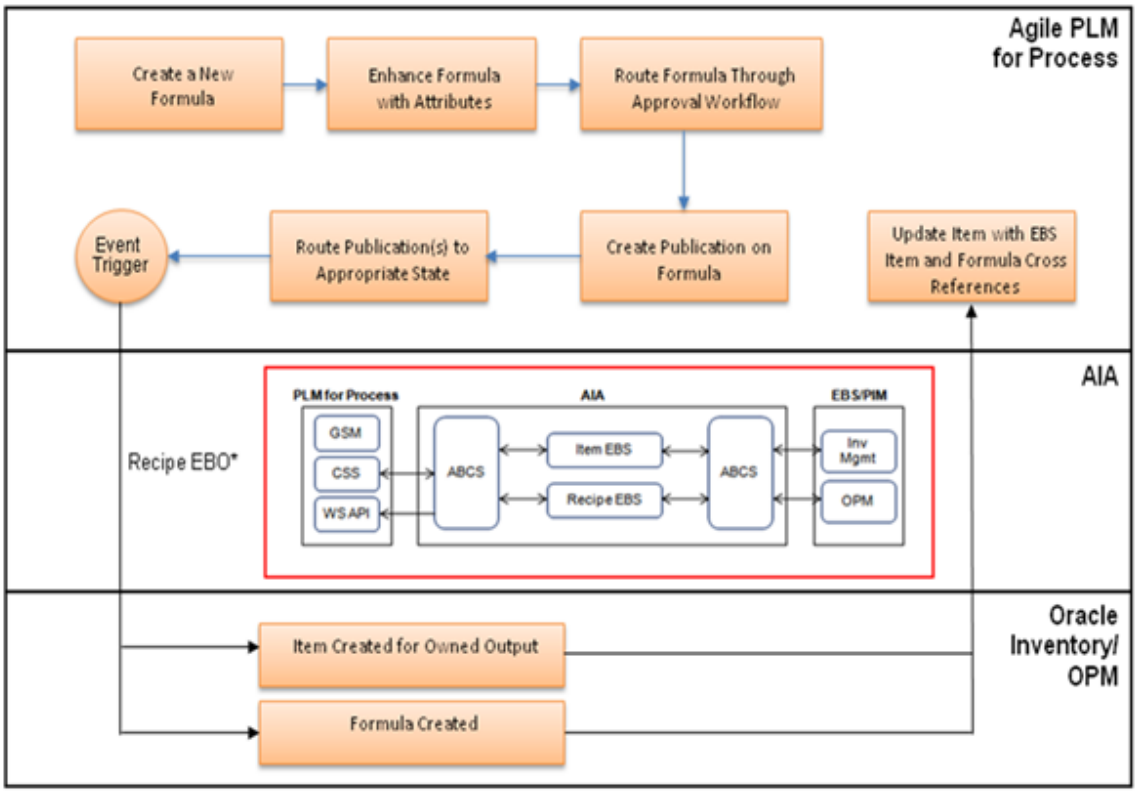
The following diagram illustrates the formula/recipe syndication process for this PIP:



*Recipe EBO contains Formula and Routing components

Formula/Recipe Syndication Process Flow

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, consisting of the same bill of material as the Agile PLM for Process 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 Oracle Inventory in the 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 Oracle Inventory as master items. When the formulation is syndicated, organization items are created for each item if they do not already exist. The organization used will be the formula owning organization either defined on the formulation in Agile or taken from the configuration file.

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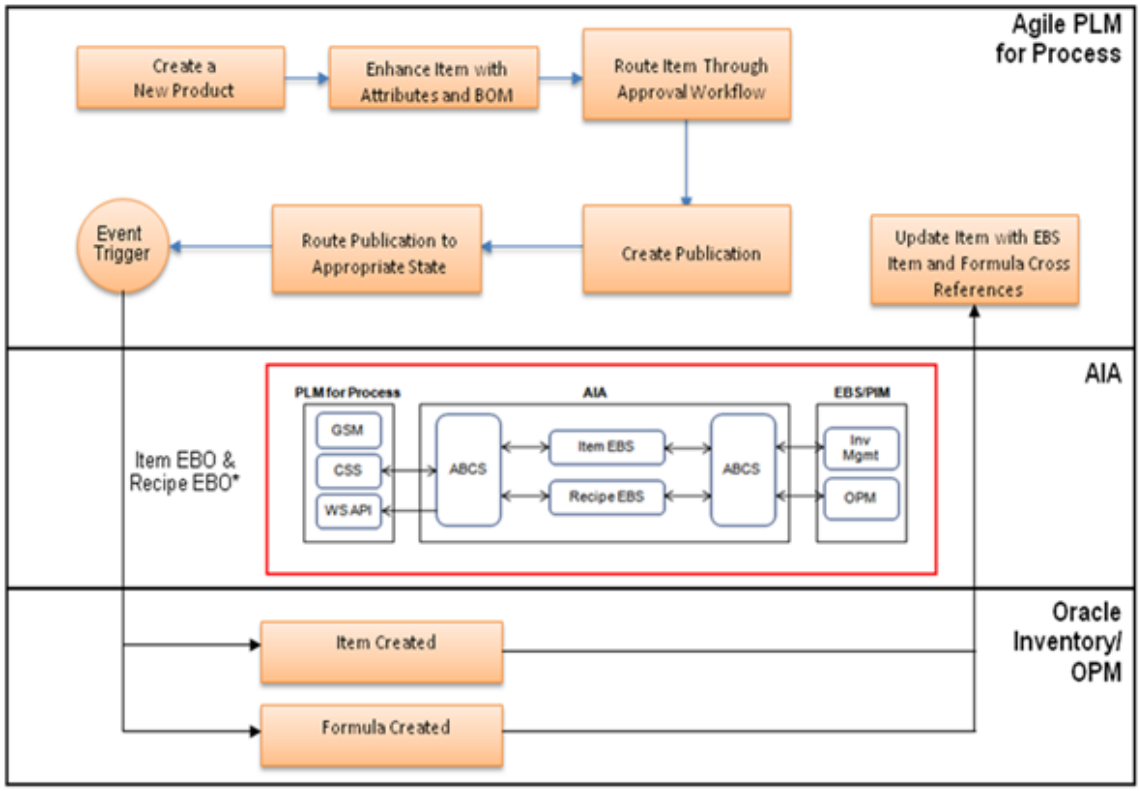
When syndicating a new issue of the formulation in Agile, a new version of the formula will be created in OPM.

Finished Goods Introduction and Update

This feature allows Product Development organizations to define finished goods (trade specifications) within PLM for Process and syndicate the appropriate data to E-Business Suite Inventory and Process Manufacturing for planning and production activities.

The syndication process can be configured to be a mandatory step in the PLM approval workflow process, therefore ensuring consistent and on-time syndication of the appropriate data. This allows planning access to the data when they need it to ensure they meet the production demands. It also provides manufacturing accurate packaging data which will decrease errors and costs and improve time-to-market.

The following diagram illustrates the finished goods syndication process for this PIP:



*Recipe EBO contains Formula and Routing components

Finished Goods Syndication Process Flow

The creation of a finished good is represented as a trade item specification and starts in Agile PLM for Process. A trade item specification contains many of the attributes required to describe the finished products sold by your company. The product developer creates the trade item 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 item specification.

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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 the syndication of all specifications that have a BOM (such as packaging, formulation, and trade item), all the BOM items need to previously exist in Oracle Inventory in the E-Business Suite. The lower level items will have to be syndicated prior to the finished good 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 Oracle Inventory to represent the trade item. As well, a formula will be created in OPM to represent the bill of materials for the trade item. 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 item in E-Business Suite. Just like formulation syndication, the corresponding organization 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.

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Participating Application Enhancements

Minor enhancements were made to the Content Synchronization and Syndication (CSS) application of Agile PLM for Process to streamline the synchronization of product, recipe, and raw material data.

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Foundation Pack Enhancements

The Oracle Design-to-Release Integration Pack for Agile Product Lifecycle Management for Process and Oracle Process Manufacturing 3.1.1 is supported by Foundation Pack 11gR1 (11.1.1.4.0) and available on Oracle Fusion Middleware/SOA Suite 11g.

For more information, see *Oracle Application Integration Architecture Foundation Pack 11g Release 1 Release Notes*.

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Additional Resources

There are additional resources that can help your organization learn more about this release.

Resource	Navigation
Process Integration Pack Implementation Guides	Oracle Technology Network: http://www.oracle.com/technetwork/index.html
Foundation Pack Guides	Oracle Technology Network: http://www.oracle.com/technetwork/index.html
Installation and Upgrade Guide	Oracle Technology Network: http://www.oracle.com/technetwork/index.html

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