Manufacturing

M100 Basic Manufacturing Implementation

Training Guide

Acumatica
The Cloud ERP

Contents

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How to Use This Course

This course introduces the Acumatica ERP Manufacturing Edition functionality based on a set of examples that illustrate implementation of the basic manufacturing processes, that is, bills of material, production management, and material requirements planning, in a midsize company. The course consists of lessons that guide you step by step through the examples and explanations of the configuration flow in Acumatica ERP Manufacturing Edition.

This course must be completed on Acumatica ERP 2020 R2 (Update 6 or later). For this course, you will use an Acumatica ERP tenant with the *U100* dataset preloaded.

You perform the following general steps to complete the course:

1. You prepare an Acumatica ERP 2020 R2 (Update 6 or later) instance as described in *How to Create a Tenant with the U100 Dataset*.

2. In the company with the *U100* dataset, you complete the process activities.

3. At Partner University, you read the rules of the assessment test.

4. At Partner University, you take the Certification Test.

5. At Partner University, you complete the course survey to finish the course and get the Partner University certificate of course completion.

What Is in a Lesson

Lessons of this training guide provide a brief overview of the required system configuration and a description of other settings that could affect the workflow.

Each lesson includes at least one implementation activity that you have to complete in your Acumatica ERP instance to configure the core system settings or to prepare system entities.

In the **Additional Materials** chapter, you can find forms and reports related to lessons of the guide.

What Are the Documentation Resources

The complete Acumatica ERP documentation is available on *https://help.acumatica.com/* and is included in the Acumatica ERP instance. While viewing any form used in the course, you can click the **Open Help** button in the top pane to bring up a form-specific Help menu; you can use the links on this menu to quickly access form-related concepts and procedures and to open a reference topic with detailed descriptions of the form elements.

How to Create a Tenant with the *U100* Dataset

To add to an existing Acumatica ERP instance a tenant with the *U100* dataset, which is required for the completion of this course, and prepare the tenant for completing the activities, perform the following instructions:

1. Go to *http://acumatica-builds.s3.amazonaws.com/index.html?prefix=builds/*.

2. Open the folder of your Acumatica ERP instance version.

3. In this folder, open the `Snapshots` folder, and download the `u100.zip` file.

4. Launch the Acumatica ERP instance, and sign in.

5. Open the *Tenants* (SM203520) form, and click **Add New Record** on the form toolbar.

6. In the **Login Name** box, type the name to be used for the tenant.

7. On the form toolbar, click **Save**.

8. On the **Snapshots** tab, click **Import Snapshot**.

9. In the **Upload Snapshot Package** dialog box, select the u100.zip file, which you have downloaded, and click **Upload**.

   The system uploads the snapshot to the **Snapshots** tab of the *Tenants* form.

10. On the form toolbar, click **Restore Snapshot**.

11. If the **Warning** dialog box appears, click **Yes**.

12. In the **Restore Snapshot** dialog box, make sure that the correct snapshot package is being uploaded, and click **OK**.

13. Open the *Manage Financial Periods* (GL503000) form.

14. In the Selection area, specify the following settings:

    - **Company**: *SWEETLIFE* (default)

    - **Action**: *Open*

    - **To Year**: *2020*

15. On the form toolbar, click **Process All**.

16. In the **Processing** pop-up window, which opens, click **Close**.

17. Sign out of the current tenant.

    You are now on the Sign-In page, and you can sign in to the tenant you have just created.

Licensing Information

For educational purposes of this course, you use Acumatica ERP under the trial license that does not require activation and provides all available features. For production, you have to activate the purchased license; each particular feature may be a subject to additional licensing; please consult the Acumatica ERP sales policy for details.

Company Story

This topic explains the organizational structure and operational activity of the company with which you will work during this training.

Company Structure

The SweetLife Fruits & Jams company is a midsize company located in New York City. The company consists of the following branches:

- SweetLife Head Office and Wholesale Center: This branch of the company consists of a jam factory and a large warehouse where the company stores fruit (purchased from wholesale vendors) and the jam it produces. Warehouse workers perform warehouse operations by using barcode scanners or mobile devices with barcode scanning support.

- SweetLife Store: This branch has a retail shop with a small warehouse to which the goods to be sold are distributed from the company's main warehouse.

- Service and Equipment Sales Center: This branch is a service center with a small warehouse where juicers are stored. This branch assembles juicers, sells juicers, installs juicers, trains customers' employees to operate juicers, and provides juicer servicing.

Operational Activity

The company has been operating starting in the *01-2019* financial period. In November 2019, the company started using Acumatica ERP as an ERP and CRM system and migrated all data of the main office and retail store to Acumatica ERP. Because the company has grown, the equipment center has begun its operations in *01-2020*.

Company Purchases

The company purchases fruits and spices from large fruit vendors for sale and for jam production. For producing jams and packing jams and fruits, the company purchases jars, labels, and paper bags from various vendors. For the internal needs of the main office and store, the company purchases stationery (printing paper, pens, and pencils), computers, and computer accessories from various vendors. The company also purchases juicers and juicer parts for sale from a large juicer vendor and either purchases the installation service for the juicers or provides the installation service on its own, depending on the complexity of the installation.

Company Sales and Services

Each company's branch has its own business processes, as follows:

- SweetLife Head Office and Wholesale Center: In this branch, jams and fruit are sold to wholesale customers, such as restaurants and cafés. The company also conducts home canning training at the customer's location and webinars on the company's website.

- SweetLife Store: In the store, retail customers purchase fresh fruit, berries, and jams, or pick up the goods they have ordered on the website. Some of the goods listed in the website catalog are not stored in the retail warehouse, such as tropical fruits (which are purchased on demand) and tea (which is drop-shipped from a third-party vendor).

- Service and Equipment Sales Center: This branch assembles juicers, sells juicers, provides training on equipment use, and offers equipment installation, including site review and maintenance

services. The branch performs one-time endeavors as well as complex projects with their own budgets.

Lesson 1: Preparing the System for Manufacturing Implementation

System Preparation for Manufacturing Implementation: General Information

Before you start implementing the manufacturing functionality in Acumatica ERP, you need to prepare the system—that is, specify the general settings that will be used by particular manufacturing processes—as described in this topic.

Learning Objectives

In this chapter, you will learn how to do the following:

- Enable the needed set of features before you start implementing manufacturing

- Specify the required settings to prepare the system for implementing manufacturing

- Create stock items involved in manufacturing

Applicable Scenarios

You configure general settings for manufacturing in either or both of the following cases:

- When you are initially implementing Acumatica ERP and the *Manufacturing* feature is included in your license

- When you have purchased the *Manufacturing* feature, and you need to configure manufacturing in the existing Acumatica ERP system

Prerequisites

Before you start preparing the system to implementing manufacturing, you should make sure that the following criteria have been met:

1. The general ledger functionality has been configured, as described in *General Ledger: General Information*.

2. Order and inventory management functionality have been configured. For details, see *Order Management with Inventory Configuration: Implementation Activity*.

3. For integration with projects, the project management functionality has been configured, as described in *Project Basic Configuration: General Information*.

System Preparation for Manufacturing Implementation

To implement the general configuration of manufacturing in Acumatica ERP, you perform the following steps:

1. On the *Enable/Disable Features* (CS100000) form, you make sure that the *Manufacturing* feature and all nested features that you will use in your system are enabled.

> ⚠️ In a production environment, after the features are enabled, you have to activate the Acumatica ERP license by using the *Activate License* (SM201510) form. Each particular feature may be subject to additional licensing; please consult the Acumatica ERP sales policy for details.

2. On the *Numbering Sequences* (CS201010) form, you create the numbering sequences for manufacturing batches and entities.

3. On the *Companies* (CS101500) form, you specify the number of decimal places for quantities and for prices and costs.

4. On the *Chart of Accounts* (GL202500) form, you create the GL accounts to be used in manufacturing processes.

5. On the *Posting Classes* (IN206000) form, you create the posting classes to be used for the inventory items involved in manufacturing.

6. On the *Availability Calculation Rules* (IN201500) form, you specify the availability calculation rules for the stock items to be involved in manufacturing.

7. If the *Inventory Replenishment* feature (in the *Inventory and Order Management* group of features) is enabled on the *Enable/Disable Features* form, on the *Replenishment Classes* (IN208800) form, you create replenishment classes for items to be manufactured and purchased. If the feature is disabled, you specify replenishment settings for item classes or particular stock items.

8. On the *Warehouses* (IN204000) form, you define the warehouses and locations that will be involved in manufacturing.

9. On the *Item Classes* (IN201000) form, you create the item classes that will provide the default settings for the stock items involved in manufacturing.

10. On the *Stock Items* (IN202500) form, you create the stock items to be used in manufacturing.

11. On the *Item Warehouse Details* (IN204500) form, for items involved in manufacturing that can be stored in multiple warehouses, you specify the item settings that are specific to a particular warehouse.

12. On the *Employees* (EP203000) form, you specify the needed setting for employees that will be involved in production.

13. On the *Order Types* (SO201000) form, you configure the sales order types that will be used in production management.

Posting Settings

A variety of GL accounts must be created in the system on the *Chart of Accounts* (GL202500) form and then specified on the forms that provide posting settings for transactions related to manufacturing processes. You need to create specific GL accounts and specify them in the system as follows:

- You need to create the Work in Progress (WIP) account and the WIP Variance account, which are required for users to create production orders. The accounts should then be specified on the *Posting Classes* (IN206000) form for the posting class; if posting classes are not used, the accounts should be specified on the *Production Order Types* (AM201100). For more information about posting classes, see *Posting Classes: General Information*.

- You need to create a specific Labor account for labor expenses to be reported. Then you create a labor code by using the *Labor Codes* (AM206500) form and specify the corresponding account in the settings of this code. Labor codes are required when you create work centers on the *Work Centers* (AM207000) form. If indirect time will be reported according to the manufacturing processes of your organization, you can also create a GL account for indirect labor expense or you can use the same account as you use for direct labor. If you create a separate GL account for indirect labor expense, you also need to create a separate labor code.

- If overhead, tooling, machine, or scrap costs are to be charged to production orders then you need to create a separate expense account to track each of these types of costs. The forms where you specify these accounts are the following:

  - *Overhead* (AM202500): On this form, you specify the overhead GL account for each overhead.

  - *Machines* (AM204500): On this form, you specify a GL account used for machine costs.

  - *Tools* (AM205500): On this form, you specify a GL account used for tool costs.

  - *Reason Codes* (CS211000): On this form, you create a reason code specifically for scrap and specify the GL account that will be used for scrap costs.

Warehouse Settings

You need to define each warehouse and its locations where the stock items involved in manufacturing will be stored by using the *Warehouses* (IN204000) form. You may use an existing warehouse or create a separate one.

You define a warehouse involved in manufacturing as follows:

1. On the **Location Table** tab, you define the locations that will be involved in manufacturing as follows:

   - For each warehouse location that is used for planning purposes within material requirements planning (MRP), you select the **MRP** check box.

   - For each location used for storing materials, you select the **Sales Allowed** and **Assembly Allowed** check boxes to indicate that this location can be used to issue items to production orders.

   - For each location used for storing manufactured items, you select the **Receipts Allowed** and **Assembly Allowed** check boxes to indicate that this location can be used to receive items from production orders.

2. On the **GL Accounts** tab, you specify the **Work in Progress** and **WIP Variance** accounts.

3. In the **General** section of the **Manufacturing** tab, you select check boxes for the entities or documents to indicate which supply and demand are considered for this warehouse during material requirements planning. We recommend that all check boxes be selected in a production system.

For more information about warehouses and warehouse locations, see *Warehouses: General Information* and *Warehouse Locations and Single-Step Transfers: General Information*.

Availability Calculation Settings

For each item to be added to manufacturing transactions, you need to specify whether it will be available for issuing. For this purpose, on the *Availability Calculation Rules* (IN201500) form, you create or modify an availability calculation rule, in which you also select or clear check boxes for plan types

related to manufacturing. You can include or deduct the quantities of items added to production orders in the available quantities of items.

For details about availability calculation, see *Availability Calculation Rules: General Information*.

Replenishment Settings

To indicate that a stock item is manufactured and must be included in material requirements planning, you specify replenishment settings as follows:

- If you use the replenishment functionality in Acumatica ERP—that is, the *Inventory Replenishment* feature is enabled on the *Enable/Disable Features* (CS100000) form—on the *Replenishment Classes* (IN208800) form, you create two replenishment classes: one with a source of *Purchase* and another for a source of *Manufacturing*, because these are the two key source types material requirements planning will use. Then you will specify the appropriate replenishment class, which depends on whether the item will be manufactured or purchased, in the replenishment settings of particular item classes, items, or both.

- If the *Inventory Replenishment* feature is disabled, you select the needed replenishment source in the **Replenishment Source** box of the **General Settings** tab on the *Item Classes* (IN201000) for the item class or in the **Source** box on the **Manufacturing** tab of the *Stock Items* (IN202500) form for the item.

Settings of Items Involved in Manufacturing

Items involved in manufacturing can be purchased (these items are usually components used in the production process) or manufactured (these items are usually the finished goods to be sold to customers). To provide default settings for groups of similar items, you create item classes on the *Item Classes* (IN201000) form. For each item class, you specify the following settings:

- The posting class with the Work in Progress and WIP Variance GL accounts specified

- The default warehouse where the items of the class will be stored

- The availability calculation rule, which provides information for calculating the availability of items involved in manufacturing

- Replenishment settings that indicate if items of the class will be produced or purchased

For more information about item classes, see *Item Classes for Stock Items: General Information*.

Then on the *Stock Items* (IN202500) form, you create stock items; this process unfolds somewhat differently depending on whether the item is manufactured or purchased. For items being manufactured, you perform the following general steps:

1. You select an item class that was created for items being manufactured.

2. If the *Inventory Replenishment* feature is enabled on the *Enable/Disable Features* (CS100000) form, on the **Replenishment Info** tab, you make sure that a replenishment class with the *Manufacturing* replenishment source has been added, and you specify the value of the **Safety Stock** box. This will set a certain level of inventory in the system to be planned for within material requirements planning.

3. If the *Inventory Replenishment* feature is disabled, in the **Replenishments** section of the **Manufacturing** tab, you make sure that the *Manufacturing* replenishment source is specified, and you add the value in the **Safety Stock** box.

4. In the **General** and **Scheduling** sections of the **Manufacturing** tab, you specify the needed settings.

For items being purchased, you perform the following general steps:

1. You select an item class that was created for items being purchased.

2. On the **Vendor Details** tab, you specify the vendors from which the item will be purchased and make sure that the lead time is specified. The specification of the lead time is important so that during the material requirements planning process, personnel can consider this time when planning the supply.

3. On the **Warehouse Details** tab, you make sure that at least one warehouse is specified.

4. On the **Price/Cost Info** tab, specify the cost as follows, depending on the valuation method: For items with the *Standard* method, specify the cost in the **Pending Cost** box; for items with all other methods, specify the cost in the **Last Cost** box.

5. If the *Inventory Replenishment* feature is enabled on the *Enable/Disable Features* form, on the **Replenishment Info** tab, you make sure that a replenishment class with the *Purchase* replenishment source has been added.

6. If the *Inventory Replenishment* feature is disabled, in the **Replenishments** section of the **Manufacturing** tab, you make sure that the *Purchase* replenishment source is specified.

7. In the **General** and **Scheduling** sections of the **Manufacturing** tab, you specify the needed settings.

For each item that has warehouse-specific settings, on the *Item Warehouse Details* (IN204500) form, you also need to do the following:

1. You make sure that warehouse locations are specified in the **Default Receipt To** and **Default Issue From** boxes, to make data entry easier for users.

2. If an item cost depends on the warehouse where the item is stored, on the **Price/Cost Information** tab, you enter a warehouse-specific cost for the item.

3. If the *Inventory Replenishment* feature is enabled on the *Enable/Disable Features* form, on the **Replenishment Info** tab, you make sure that the replenishment class and the replenishment source are specified correctly.

4. If the *Inventory Replenishment* feature is disabled, in the **Replenishments** section of the **Manufacturing** tab, you make sure that the needed replenishment source is specified in the **Source** box.

Settings of Employees Involved in Manufacturing

To record the labor expenses for employees involved in manufacturing, on the *Employees* (EP203000) form, you select the **Production Employee** check box on the **General Info** tab.

If you want to post labor transactions by using the employee cost, on the *Labor Cost Rates* (PM209900) form, you create the needed cost rates and then specify a cost rate for each employee involved in manufacturing.

Settings of Sales Documents

If the business process of your organization involves users creating production orders directly from sales orders, you must configure this functionality for each order type you use as follows: On the **General Settings** tab of the *Order Types* (SO201000) form, you select either or both of the following check boxes: **Allow Production Orders - Approve** (which provides users with the ability to create production orders that have the *Approved* status from sales orders) and **Allow Production Orders - Hold** (which provides users with the ability to create production orders that have the *On Hold* status from sales orders).

Order types that typically used to create production orders are *SO* (a regular sales order), *TR* (a transfer order), and *QT* (a quote). For quotes, you can also select the **Allow Estimating** check box to allow estimate entries.

> ⚠️ We do not recommend that you select this check box for other order types because estimates may include non-inventory items that cannot be shipped or issued.

System Preparation for Manufacturing Implementation: Implementation Checklist

The following section provides details you can use to ensure that the system is configured properly for implementing manufacturing.

Implementation Checklist

We recommend that before you start configuring manufacturing-specific settings, you make sure the needed features have been enabled, settings have been specified, and entities have been created, as summarized in the following checklist.

Form	Criteria to Check
Enable/Disable Features (CS100000)	The following features have been enabled: ● The *Manufacturing* group of features. If you use additional manufacturing functionality (such as estimates), make sure that the corresponding features have been enabled within this group of features. ● The *Inventory* feature within the *Inventory and Order Management* group of features.

Form	Criteria to Check
Numbering Sequences (CS201010)	Numbering sequences should be created for the following: ● Bill of material (required) ● Production order (required) ● Batches of move transactions (required) ● Batches of labor transactions (required) ● Batches of material transactions (required) ● Batches of WIP adjustment transactions (required) ● Batches of cost transactions (required) ● Forecast (required) ● MPS type (required) ⓘ You can use the same numbering sequence for the batches of move, labor, and material transactions.
Companies (CS101500)	The number of decimal places for quantities in the **Quantity Decimal Places** box and for prices and costs in the **Price/Cost Decimal Places** box of the **Company Details** tab is specified according to the business processes of your organization.
Chart of Accounts (GL202500)	The following GL accounts have been created: ● Work in Progress (required) ● WIP Variance (required) ● Direct Labor (required) ● Indirect Labor ● Overhead ● Tooling Usage ● Machine Usage ● Scrap Expense
Posting Classes (IN206000)	Posting classes to be used for the inventory items involved in manufacturing have been created, and the Work in Progress and WIP Variance accounts have been specified in the posting class settings.

Form	Criteria to Check
Availability Calculation Rules (IN201500)	Availability calculation rules have been created for the stock items to be involved in manufacturing.
Replenishment Classes (IN208800)	If the *Inventory Replenishment* feature (in the *Inventory and Order Management* group of features) is enabled on the *Enable/Disable Features* (CS100000) form, the replenishment classes that will be used for items in manufacturing processes have been created. At least two classes must be created, one with the *Manufacturing* (for items being manufactured) and one with the *Purchase* (for items being purchased) replenishment sources.
Item Classes (IN201000)	The item classes that will provide the default settings for the newly created stock items involved in manufacturing have been created. ⚠ If the *Inventory Replenishment* feature is disabled on the *Enable/Disable Features* form, specify the replenishment source for the items of the class in the **Replenishment Source** box of the **General Settings** tab.
Stock Items (IN202500)	Stock items to be used in manufacturing have been created—both the components and the items to be produced.
Warehouses (IN204000)	The needed warehouses and warehouse locations that will be involved in manufacturing have been defined. ⚠ • For warehouses that are not involved in manufacturing, on the **Manufacturing** tab, clear all the check boxes in the **General** section. • For warehouse locations that are not involved in manufacturing, on the **Location Table** tab, clear the check box in the **MRP** column.
Item Warehouse Details (IN204500)	For items involved in manufacturing that can be stored in multiple warehouses, all applicable item settings have been specified that are specific to a particular warehouse, such as the replenishment method, cost information, and default warehouse locations for receiving and issuing items.
Employees (EP203000)	The **Production Employee** check box is selected for each employee for which labor may be entered in a production order.

Form	Criteria to Check
Order Types (SO201000)	Sales order types have been configured that will be used for production management so that users can create production orders from orders of this type.

System Preparation for Manufacturing Implementation: Implementation Activity

In the following implementation activity, you will learn how to prepare the system for specifying manufacturing-specific settings.

> ⚠ The following activity is based on the *U100* dataset. If you are using another dataset, or if any system settings have been changed in *U100*, these changes can affect the workflow of the activity and the results of the processing. To avoid any issues, restore the *U100* dataset to its initial state.

Story

Suppose that based on requests from customers, SweetLife Fruits & Jams has decided to assemble customized juicers. The company has organized a work center where workers assemble juicers from parts bought from the Sqeezo Inc. vendor.

As an implementation manager, you need to prepare the system for the specification of manufacturing-specific settings.

Process Overview

In this activity, to prepare the system for the implementation of manufacturing functionality, you will do the following:

1. On the *Numbering Sequences* (CS201010) form, you will make sure that the numbering sequences for manufacturing batches and entities have been created.

2. On the *Chart of Accounts* (GL202500) form, you will make sure that the GL accounts required for manufacturing processes have been created.

3. On the *Posting Classes* (IN206000) form, you will make sure that a posting class that will provide posting settings to the items involved in manufacturing has been created.

4. On the *Warehouses* (IN204000) form, you will make sure that the warehouse and locations to be involved in manufacturing have been created and defined properly.

5. On the *Availability Calculation Rules* (IN201500) form, you will make sure that the availability calculation rule that will be used for calculating availability of items involved in manufacturing has been created.

6. On the *Replenishment Classes* (IN208800) form, you will make sure that the replenishment class for items being manufactured has been created.

7. On the *Item Classes* (IN201000) form, you will make sure that the item classes that will provide default settings for items involved in manufacturing have been created and defined properly.

8. On the *Stock Items* (IN202500) form, you will create a stock item for a juicer, which will be assembled.

9. On the *Stock Items* (IN202500) form, you will create a stock item for a juicer part, which will be purchased.

10. On the *Employees* (EP203000) form, you will specify the appropriate setting for an employee that will be involved in manufacturing.

11. On the *Order Types* (SO201000) form, you will review the settings of the SO order type and configure the *TR* and *QT* order types, which will be involved in the manufacturing processes.

12. On the *BOM Preferences* (AM101000) form, you will review the basic settings related to bills of material.

13. On the *Production Preferences* (AM102000) form, you will review the basic settings related to production management

System Preparation

Before you start specifying the general settings to prepare the system for manufacturing implementation, you perform the following instructions:

1. Sign in to a company with the *U100* dataset preloaded; you need to sign in as a system administrator with the *gibbs* username and *123* password.

2. On the *Enable/Disable Features* (CS100000) form, enable the following features:

   - *Manufacturing*

   - *Material Requirements Planning*

   - *Product Configurator*

   - *Estimating*

   - *Advanced Planning and Scheduling*

   - *Engineering Change Control*

   - *Manufacturing Data Collection*

Step 1: Reviewing Numbering Sequences

In a production system, you would need to create all of the numbering sequences that will be used in the system for manufacturing batches and entity identifiers. These numbering sequences have been defined in the U100 dataset for simplicity; you will verify that they have been created and review the settings of one of the numbering sequences. Do the following:

1. Open the *Numbering Sequences* (CS201010) form.

2. In the **Numbering ID** box of the Summary area, click the selector button.

3. In the lookup table that opens, make sure that the following predefined numbering sequences exist in the list:

   - *AMBATCH*

- *AMBOM*

- *AMCOST*

- *AMDIS*

- *AMECO*

- *AMECR*

- *AMEST*

- *AMFCST*

- *AMMATL*

- *AMMPS*

- *AMPROD*

- *AMVSHIP*

- *AMWIP*

4. Select *AMBOM* (which is the numbering sequence created for numbering bills of material), and review its settings as follows:

    a. In the Summary area, the **Manual Numbering** check box is cleared, which means that bills of material will be numbered automatically.

    b. The value in the **Start Number** column of the only row is *BOM000001*, which is the number of the first bill of material.

These numbering sequences will be specified on the appropriate forms so that they can be used during the manufacturing processes.

Step 2: Reviewing the GL Accounts

In a production system, you would need to create the GL accounts that will be used in manufacturing; these accounts have been predefined in the *U100* dataset for simplicity. In this step, you will verify that these accounts have been created. Do the following:

1. Open the *Chart of Accounts* (GL202500) form.

2. Make sure that the following accounts are listed in the table:

- *12400 - Work in Progress*

  > ⚠️ In a production system, the non-project Work in Progress account should be used for manufacturing.

- *51000 - Accrued COGS - Direct Labor Costs*

- *51050 - Accrued COGS - Fixed Overhead Costs*

- *51060 - Accrued COGS - Fixed Machine Costs*

- *51070 - Accrued COGS - Fixed Tool Costs*

- *51100 - Accrued COGS - Indirect Labor Costs*

- *51150 - Accrued COGS - Variable Overhead Costs*

- *51500 - COGS - WIP Inventory Variance*

- *51600 - COGS - Scrap Expense*

These accounts will be specified on the appropriate forms so that they can be used during the manufacturing processes.

Step 3: Reviewing a Posting Class

In a production system, you would need to create the posting class that will be used in manufacturing. This posting class has been predefined in the *U100* dataset for simplicity. In this step, you will verify that this posting class has been created as follows:

1. Open the *Posting Classes* (IN206000) form.

2. In the **Class ID** box of the Summary area, select *MFGI*.

3. On the **Posting Settings** tab, make sure that *Inventory Item* is selected in the **Use WIP Account From** and **Use WIP Variance Account From** boxes. This means that the system will copy these accounts from the inventory item that is involved in a transaction, and the accounts can be changed on the item level if necessary.

4. On the **GL Accounts** tab, make sure that in the **Work in Process Account** box, *12400 - Work in Progress* is selected.

5. In the **WIP Variance Account** box, make sure that *51500 - COGS - WIP Inventory Variance* is selected.

Step 4: Reviewing Warehouse and Location Settings

In a production system, you would need to create a warehouse and its locations that will be dedicated to manufacturing or specify manufacturing-related settings for an existing warehouse and its locations. In the *U100* dataset, a separate warehouse has been created and all required settings have been specified. In this step, you will review the settings for this predefined warehouse and its locations and for a warehouse that is not involved in manufacturing. Do the following:

1. Open the *Warehouses* (IN204000) form.

2. In the **Warehouse ID** box of the Summary area, select *WORKHOUSE*.

3. In the **Branch** box, make sure that *SWEETEQUIP* is selected.

4. On the **Location Table** tab, do the following:

   a. In the **MRP** column, make sure that the check box is selected for each location.

   b. In the row with the *MTL* location (which will be used for storing materials), make sure that the following check boxes are selected:

   - **Include in Qty. Available**

- **Sales Allowed**

- **Transfers Allowed**

> ⚠️ The **Assembly Allowed** check box, which must be selected for locations involved in production, is not displayed because the *Kit Assembly* feature is disabled on the *Enable/Disable Features* (CS100000) form for the U100 dataset. This check box is selected by default.

   c. In the row with the *MG* location (which will be used for storing manufactured items), make sure that the following check boxes are selected:

- **Include in Qty. Available**

- **Receipts Allowed**

- **Transfers Allowed**

> ⚠️ The **Assembly Allowed** check box, which must be selected for locations involved in production, is not displayed because the *Kit Assembly* feature is disabled on the *Enable/Disable Features* (CS100000) form for the U100 dataset. This check box is selected by default.

5. On the **GL Accounts** tab, do the following:

   a. Make sure that in the **Work in Process Account** box, the *12400 - Work in Progress* account is selected.

   b. In the **WIP Variance Account** box, make sure that the *51500 - COGS - WIP Inventory Variance* account is selected.

6. On the **Manufacturing** tab, make sure that all check boxes are selected in the **General** section.

7. In the **Warehouse ID** box of the Summary area, select *EQUIPHOUSE* (this warehouse is not involved in manufacturing).

8. On the **Location Table** tab, make sure that the check box in the **MRP** column is cleared for all rows.

9. On the **Manufacturing** tab, make sure that all check boxes are cleared in the **General** section.

The *WHOLESALE* and *RETAIL* warehouses have similar settings to those specified for *EQUIPHOUSE*, because they too are not involved in manufacturing.

Step 5: Reviewing Availability Calculation Rules

In a production system, you would need to create an availability calculation rule that will include additional settings related to documents used in manufacturing processes. This availability calculation rule has been predefined in the *U100* dataset for simplicity. In this step, you will review settings of the rule. Do the following:

1. Open the *Availability Calculation Rules* (IN201500) form.

2. In the **Availability Calculation Rule** box, select *MFGITEMS*.

3. Make sure that the following check boxes are selected:

- **Deduct Qty. on Issues**

- **Deduct Qty. on Sales Prepared**

- **Deduct Qty. Shipped**

- **Deduct Qty. Allocated**

- **Deduct Qty. on Production Demand Prepared**

- **Deduct Qty. on Production Demand**

- **Deduct Qty. on Production Allocated**

- **Include Qty. on Receipts**

- **Include Qty. on PO Receipts**

With these settings, the quantities of items that are issued, shipped, allocated to sales orders, and allocated to production orders will be deducted from the available quantity; the quantities of items that are included in inventory and PO receipts will be added to the available quantity.

Step 6: Reviewing Replenishment Classes

If in a production system the *Inventory Replenishment* feature is enabled on the *Enable/Disable Features* (CS100000) form, you would need to create replenishment classes that will be used for items being manufactured. These replenishment classes have been predefined in the *U100* dataset for simplicity. In this step, you will review the settings of the replenishment classes. Do the following:

1. Open the *Replenishment Classes* (IN208800) form.

2. Make sure that the class with the *Manufacturing* replenishment source in the **Replenishment Source** column is displayed in the table. This class will be used for items to be manufactured.

3. Make sure that the class with the *Purchase* replenishment source is displayed in the table. This replenishment class will be used for items to be purchased.

Step 7: Reviewing Item Classes

In a production system, you would need to create one or multiple item classes that will provide default settings to newly created items involved in manufacturing. Two item classes have been predefined in the *U100* dataset for simplicity. In this step, you will review settings of the item classes. Do the following:

1. Open the *Item Classes* (IN201000) form.

2. In the **Item Class Tree** of the left pane, select *JUICERCFG*. This item class provides default settings for new configurable juicer items.

3. On the **General Settings** tab, do the following:

   a. In the **General Settings** section, make sure that the **Stock Item** check box is selected.

   b. In the **Posting Class** box, make sure that *MFGI* is selected.

   c. In the **Default Warehouse** box, make sure that *WORKHOUSE* is selected.

   d. In the **Availability Calculation Rule** box, make sure that *MFGITEMS* is selected.

    e. In the **Unit of Measure** section, make sure that the **Divisible Unit** check boxes are cleared. This means that the system will operate with only integer quantities of items in transactions and documents.

4. On the **Replenishment Settings** tab, make sure that a row with the *PRODUCTION* replenishment class has been added.

    This indicates that items of the class will be manufactured.

5. In the **Item Class Tree**, select *JCRCFGPRT*. This item class provides default settings for new part items for configurable juicers.

6. On the **General Settings** tab, do the following:

    a. In the **General Settings** section, make sure that the **Stock Item** check box is selected.

    b. In the **Posting Class** box, make sure that *MFGI* is selected.

    c. In the **Default Warehouse** box, make sure that *WORKHOUSE* is selected.

    d. In the **Availability Calculation Rule** box, make sure that *MFGITEMS* is selected.

    e. In the **Unit of Measure** section, make sure that the **Divisible Unit** check boxes are cleared. This means that the system will operate with only integer quantities of items in transactions and documents.

7. On the **Replenishment Settings** tab, make sure that the row with the *PURCHASE* replenishment class has been added.

    This indicates that items of the class will be purchased.

Step 8: Creating a Stock Item Being Manufactured

You will create a stock item for a juicer that makes juice from soft fruits and berries. Do the following:

1. Open the *Stock Items* (IN202500) form.

2. On the form toolbar, click **Add New Record**.

3. In the **Inventory ID** box of the Summary area, type `CFJSOFT`.

4. In the **Description** box, type `A configurable juicer for soft fruit, vegetables, and berries`.

5. In the **Item Class** box of the **General Settings** tab (**Item Defaults** section), select *JUICERCFG*. The system copies the settings of the item class into the following boxes of the section:

- **Type**: *Finished Good*

- **Valuation Method**: *Average*

- **Posting Class**: *MFGI*

- **Default Warehouse**: *WORKHOUSE*

6. On the **Replenishment Info** tab, make sure that the row with the *PRODUCTION* replenishment class has been copied from the item class.

7. In the **Safety Stock** column, type `20`.

8. On the **Manufacturing** tab, specify the following:

    a. In the **Dflt Mark For** box of the **General** section, select *Production*.

    b. Select the **Make to Order Item** check box.

    c. Make sure that the **MRP Item** check box is selected.

    d. In the **Replenishments** section, make sure that *Manufacturing* is selected in the **Source** box.

    e. Select the **Override** check box to the right of the **Safety Stock** box and type `3`.

    f. In the **Scheduling** section, make sure that the **Check for Material Availability** check box is selected.

9. On the form toolbar, click **Save**.

You will specify other item settings when configuring particular manufacturing processes.

Step 9: Creating a Stock Item for a Component Being Purchased

You will create a stock item for a component of a configurable juicer: a grating disc with medium peeling, which will be purchased from the Sqeezo Inc. vendor. Do the following:

1. Open the *Stock Items* (IN202500) form.

2. On the form toolbar, click **Add New Record**.

3. In the **Inventory ID** box of the Summary area, type `GRDISC03`.

4. In the **Description** box, type `Grating disc for medium peeling (for configurable juicers)`.

5. In the **Item Class** box on the **General Settings** tab (**Item Defaults** section), select *JCRCFGPRT*. The system copies the settings of the item class into the following boxes of the section:

    - **Type**: *Finished Good*

    - **Valuation Method**: *Average*

    - **Posting Class**: *MFGI*

    - **Default Warehouse**: *WORKHOUSE*

6. In the **Default Issue From** box of the **Warehouse Defaults** section, select *MTL* (which is the location where components for juicers will be stored).

7. In the **Default Receipt To** box, select *MAIN* (which is the receiving location for all items in the *WORKHOUSE* warehouse).

8. On the **Vendor Details** tab, do the following:

    a. On the table toolbar, click **Add Row**.

    b. In the **Vendor ID** column of the row, select *JALOOZA*.

    c. Make sure that the lead time is specified in the **Lead Time (Days)** column.

9. On the **Warehouse Details** tab, make sure that a row for *WORKHOUSE* has been added.

10. On the form toolbar, click **Save**.

11. In the **Last Cost** box of the **Price/Cost Info** tab, type `39.90`.

12. On the form toolbar, click **Save**.

Step 10: Selecting Employees Involved in Production

Three employees will be involved in juicer assembly: two workers and one manager. You will mark one of these employees, Carlos Cruz, as being involved in production. Do the following:

1. Open the *Employees* (EP203000) form.

2. In the **Employee ID** box of the Summary area, select *EP00000027 – Carlos Cruz*.

3. In the **Employee Settings** section on the **General Info** tab, select **Production Employee** check box.

For the other two employees, Casey Burrows and Gladys Peters, the **Production Employee** check box has already been selected.

Step 11: Configuring Sales Order Types

You will configure the *SO*, *TR*, and *QT* order types, which will be used in manufacturing processes. Do the following:

1. Open the *Order Types* (SO201000) form.

2. In the **Order Type** box of the Summary area, select *SO*.

3. In the **General Settings** section of the **General Settings** tab, select the following check boxes:

- **Allow Production Orders - Approved**

- **Allow Production Orders - Hold**

- **MTO Order**

4. In the **Order Type** box, select *TR*.

5. In the **General Settings** section of the **General Settings** tab, select the following check boxes:

- **Allow Production Orders - Approved**

- **Allow Production Orders - Hold**

- **MTO Order**

6. In the **Order Type** box, select *QT*.

7. In the **General Settings** section of the **General Settings** tab, select the **Allow Estimating** check box.

Step 12: Reviewing Bill of Material Preferences

In a production system, you would need to specify the basic settings related to bills of material to be able to start implementation of manufacturing processes. These settings have been predefined in the *U100* dataset for simplicity. In this step, you will review the bill of material settings. Do the following:

1. Open the *BOM Preferences* (AM101000) form.

2. On the **General Settings** tab, review the settings as follows:

   a. In the **BOM Numbering Sequence** box, make sure that *AMBOM* is specified. The system will use this numbering sequence for bill of material identifiers when you create a bill of material on the *Bill of Material* (AM208000) form.

   b. In the **Default Revision** box, make sure that *A* is specified. The system will copy this value when you create a bill of material on the *Bill of Material* form.

Step 13: Reviewing Production Preferences

In a production system, you would need to specify the basic settings related to production management to be able to start implementation of manufacturing processes. These settings have been predefined in the *U100* dataset for simplicity. In this step, you will review the bill of material settings. Do the following:

1. Open the *Production Preferences* (AM102000) form.

2. In the **Numbering Settings** section of the **General Settings** tab, make sure that the following has been specified:

   - **Move Numbering Sequence**: *AMBATCH*

   - **Labor Numbering Sequence**: *AMBATCH*

   - **Material Numbering Sequence**: *AMBATCH*

   - **WIP Adjustment Numbering Sequence**: *AMWIP*

   - **Cost Numbering Sequence**: *AMCOST*

You have prepared the system for the implementation of manufacturing functionality.

Implementing Bills of Material: General Process

The primary entity defined in Acumatica ERP Manufacturing Edition is a *bill of material*: a production specification that contains the details of the process of producing a particular stock item. The bill of material includes the operations involved in production, the materials used in the operations, the more detailed steps of the operations, and the factors that must be included in cost of the finished goods.

In this topic, you will find information about the general process of implementing bills of material in Acumatica ERP Manufacturing Edition. You can also find the implementation checklist for bills of material in *Bills of Material: Implementation Checklist*.

Manufacturing Entities to Be Created

You need to create the following entities before users can start processing production transactions in Acumatica ERP Manufacturing Edition:

1. Production cost drivers (for more information, see *Production Cost Drivers: General Information*): You create any of the following entities whose costs will be included in the cost of the final product:

   - Labor codes on the *Labor Codes* (AM206500) form, which provide information about direct and indirect labor costs; you specify labor codes when you create a work center.

   - Overhead rates on the *Overhead* (AM202500) form; you specify overhead entities when you create a work center, a bill of material, or both of these.

   - Cost rates for tools involved in production, on the *Tools* (AM205500) form; you specify tool entities when you create a bill of material.

   - Cost rates for machines used in production, on the *Machines* (AM204500) form; you specify machine entities when you create a work center.

   - Material costs on the *Stock Items* (IN202500) form (if the material is a stock item) or *Non-Stock Items* (IN202000) form (if the material is a non-stock item); these costs are calculated automatically when production transactions are processed in the system.

2. Work centers (described in detail in *Work Centers: General Information*): In addition to the production cost drivers mentioned above as being specified for a work center, you need to create the following entities before you create any work centers on the *Work Centers* (AM207000) form:

   - Work calendars on the *Work Calendar* (CS209000) form

   - Shifts on the *Shifts* (AM205000) form

3. Bills of material (described further in *Bills of Material: General Information*): You create bills of material on the *Bill of Material* (AM208000) form.

Thus, the order in which you create entities is important, because some entities derive settings from other entities or use them in other ways. You first create the entities that provide cost rates (materials, tools, overhead, labor codes, and machines) in any order; you then create shifts and work calendars. After that, you create work centers, and finally, you create a bill of material. (See the following diagram.)
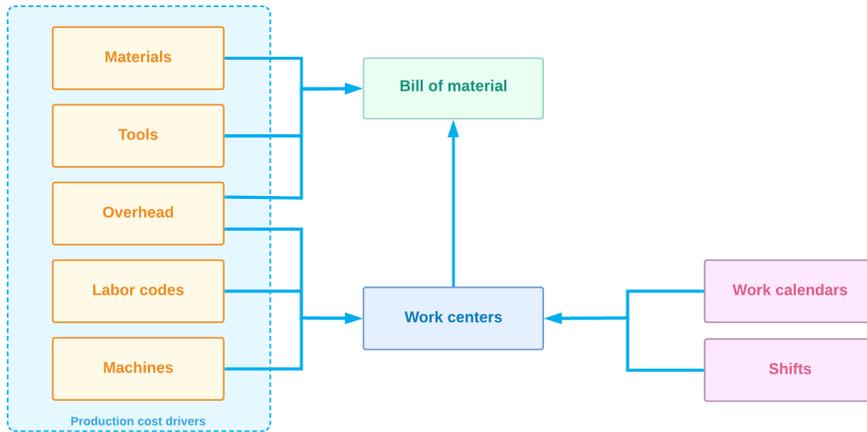
Figure: The order in which you create manufacturing entities

Lesson 2: Managing Production Cost Drivers

Production Cost Drivers: General Information

The costing of items that you make is more complex and detailed than the costing of items you buy. The costing of these manufactured items includes not only the cost of the materials bought to make an item but also the cost of labor, factory overhead, machinery, and tooling used in production. And sub-assemblies may be produced and stored that become part of the final assembly of the finished goods you sell.

In this topic, you will read about production cost drivers, which are the costs that can be included in the cost of the final product.

Learning Objectives

In this chapter, you will learn how to do the following:

- Define the labor codes so that labor costs are included in the cost of a produced item

- Define the overhead entities so that overhead costs are included in the cost of a produced item

- Define the tools so that the tool costs are included in the cost of a produced item

- Define the machines so that the machine costs are included in the cost of a produced item

Applicable Scenarios

You configure production cost drivers in the following cases:

- When you initially implement Acumatica ERP and the *Manufacturing* feature is included in your license

- When you have purchased the *Manufacturing* feature, and you need to configure manufacturing in the existing Acumatica ERP system

- When you need to add or change cost drivers that affect the cost of the produced item

Cost Drivers in Manufacturing

In Acumatica ERP Manufacturing Edition, you need to define the following entities whose costs can affect the cost of the final product:

- Materials: You define the needed materials (stock items and non-stock items) so that you can track the costs of the components used to make the finished product.

- Labor: You define labor codes in the system and use them to track the cost of the labor issued (or planned to be issued) to make the product.

- Overhead: You define the applicable overhead entities in the system and specify the overhead rates to be applied to particular operations and materials.

- Machines: You define each machine in the system, including the cost rate of running a machine for a production operation.

- Tools: You define each tool to be used in a production operation, including its cost rate for each usage.

- Subcontract: You track the value of the materials provided to and purchased from a vendor for performing the work.

Costs can be planned and actual. Planned costs are specified on the bill of material level, and actual costs are specified in production orders. The actual costs are posted when a quantity is reported or backflushed at a production order operation.

In the following sections, you can find more information about particular cost drivers.

Material Costs

Materials can include stock items and non-stock items. For a stock item, you specify the planned cost in one of the following locations:

- On the **Price/Cost Info** tab of the *Stock Items* (IN202500) form if the item is stored in one warehouse

- On the **Price/Cost Information** tab of the *Item Warehouse Details* (IN204500) form if the item is stored in multiple warehouses and the item cost is warehouse-specific

For a non-stock item, you specify the item cost on the **Price/Cost Information** tab of the *Non-Stock Items* (IN202000) form.

Labor Costs

The cost of labor can be broken down into direct labor costs and indirect (also described as *overhead*) labor costs. Direct labor costs include wages for the employees who produce a product. Indirect labor costs are associated with employees who are not involved in production directly, such as security staff. In Acumatica ERP, you can track both direct and indirect labor costs.

Labor costs are posted to a special GL account. You use the *Labor Codes* (AM206500) form to define the labor codes that will contain information about the cost type (direct or indirect) and the GL account where the labor expenses must be posted. You must define at least one labor code of the *Direct* type.

Planned labor costs are calculated based on the run units, run time, and standard cost of a work center. Actual labor costs are calculated based on either the standard cost of a work center or the employee cost rate. You select the way of calculating actual costs in the **Use Labor Rate** box on the *Production Preferences* (AM102000) form. You specify the standard cost of a work center in the **Standard Cost** box on the *Work Centers* (AM207000) form. If based on the business processes of your organization, you calculate labor costs by using the employee cost rate, you specify the rate on the *Labor Cost Rates* (PM209900) form.

For more information about labor costs, see *Backflushing Concepts* and *Labor Reporting*.

Overhead Costs

You can set up overhead costs by using the *Overhead* (AM202500) form. These costs can be accrued at a fixed rate, which is the same regardless of lot or order size, or at a variable rate, which may depend on labor hours or the quantity of goods completed. You can create as many overhead IDs as you need to account for the different overhead expenses of your organization. The full list of the supported overhead types is the following:

- *Fixed*: Uses a single fixed cost

- *Variable by Labor Hours*: Depends on the number of labor hours used in production

- *Variable by Labor Cost*: Depends on the cost of the labor used in production

- *Variable by Material Cost*: Depends on the cost of the materials used in production

- *Variable by Machine Hours*: Depends on the number of machine hours used in production

- *Variable by Quantity Completed*: Depends on the quantity of completed items

- *Variable by Total Quantity*: Depends on the quantity of completed and scrapped items

You can assign the planned overhead costs to a specific product on the *Bill of Material* (AM208000) form or to a work center on the *Work Centers* (AM207000) form, depending on whether the cost affects a particular product or the whole production process.

Actual overhead costs are applied when a quantity of produced items is reported for a production order operation.

Tool and Machine Costs

If any tools or machines are used in the production of goods in your organization, you may want to include their costs in the cost of the produced items. To add tool costs, you create all tools included in the production process by using the *Tools* (AM205500) form. On this form, you specify the unit cost, which is the cost for every usage of the tool on a production order and the GL account where tool costs must be posted.

To add machine costs to the cost of produced items, you create machines and specify their costs on the *Machines* (AM204500) form. On the form, you also select the GL account where the system will post the costs. Machines are assigned specifically to work centers. The cost is calculated at the hourly rate specified for a particular machine on the *Machines* form and can be overridden on the *Work Centers* (AM207000) form for a particular work center.

The actual tool and machine costs are posted when a quantity of the produced items is reported or backflushed in a production order operation.

Subcontractor Costs

If any outside organizations (that is, subcontractors) are involved in the production process—such as providing services or creating components of produced items—you can include the costs your organization spends for these organizations in the cost of the produced items. For details, see *Outside Processing*.

Production Cost Drivers: Configuration Prerequisites

Before starting to create cost drivers for produced items, you must be sure that the system has been configured properly and that all required entities have been created, as described in the following sections.

Enabling the Needed Features

On the *Enable/Disable Features* (CS100000) form, the *Manufacturing* feature must be enabled.

Configuring the System

Before you create records for tools, machines, overhead, and labor codes in Acumatica ERP, you need to make sure that the following actions have been performed in the system:

- On the *Chart of Accounts* (GL202500) form, all GL accounts where costs will be posted have been created.

- On the *BOM Preferences* (AM101000) form, the numbering sequence for bills of material has been specified.

- On the *Production Preferences* (AM102000) form, the numbering sequences for move, material, labor, cost, and WIP adjustments have been specified.

Production Cost Drivers: Implementation Activity

In the following implementation activity, you will learn how to create tools, machines, overhead entities, and labor codes, which are production cost drivers—that is, they determine the cost of the final products.

Story

Suppose that SweetLife Fruits & Jams has decided to assemble customized juicers according to customers' needs. For accurate calculating of the cost of the juicer, the component costs, machine costs, tool costs, labor costs, and overhead costs must be considered. In the assembly process, such tools as a screwdriver and a hammer are used. For producing small plastic parts, the injection molding machine is used. Two workers are involved in the juicer assembly. The administrative costs, payroll costs, and floor setup costs must be included in the cost of the juicers as well.

As an implementation manager, you need to create records for a machine, tools, overhead, and labor codes so that these costs are included in the cost of the juicers. The costs for the components used in juicers have been specified when the stock items for these components were created in the system, so you will not specify these costs in this activity.

Configuration Overview

The following entities, which you will use in this activity, have been predefined in the *U100* dataset:

- On the *Chart of Accounts* (GL202500) form, the following GL accounts:

  - *51000, Accrued COGS - Direct Labor Costs*

  - *51050, Accrued COGS - Fixed Overhead Costs*

  - *51060, Accrued COGS - Fixed Machine Costs*

  - *51070, Accrued COGS - Fixed Tool Costs*

  - *51100, Accrued COGS - Indirect Labor Costs*

  - *51150, Accrued COGS - Variable Overhead Costs*

- On the *Work Calendar* (CS209000) form, the *MAIN* work calendar

Process Overview

In this activity, you will do the following:

1. On the *Labor Codes* (AM206500) form, create labor codes for direct and indirect labor costs.

2. On the *Overhead* (AM202500) form, create overhead entities for administrative costs, payroll costs, and the floor setup costs.

3. On the *Tools* (AM205500) form, create tools for a screwdriver and hammer.

4. On the *Machines* (AM204500) form, create a record for the injection molding machine.

System Preparation

Before you start creating the needed entities in the system, do the following:

1. As a prerequisite to the current activity, complete *System Preparation for Manufacturing Implementation: Implementation Activity* so that the needed settings have been made in a company with the *U100* dataset preloaded.

2. Sign in to this company (in which the prerequisite activities have been performed) as a system administrator with the *gibbs* username and *123* password.

3. Make sure that the *Manufacturing* feature has been enabled on the *Enable/Disable Features* (CS100000) form.

Step 1: Creating Labor Codes

To create labor codes for direct and indirect labor expenses, do the following:

1. Open the *Labor Codes* (AM206500) form.

2. On the form toolbar, click **Add Row**.

3. In the added row, specify the following values in the columns:

    - **Type**: *Direct*

    - **Labor Code**: DIRLAB

    - **Description**: Direct labor

    - **Labor Account**: *51000*

4. Add another row for a labor code with indirect labor costs, and specify the following values in the columns of the row:

    - **Type**: *Indirect*

    - **Labor Code**: INDIRLAB

    - **Description**: Indirect labor

    - **Labor Account**: *51100*

    - **Overhead Account**: *51150*

5. On the form toolbar, click **Save**.

Step 2: Creating Overhead Entities

To create overhead entities for administrative costs, payroll costs, and floor setup costs, do the following:

1. Open the *Overhead* (AM202500) form.

2. On the form toolbar, click **Add Row**.

3. For the administrative overhead, specify the following settings in the columns of the added row:

- **Overhead ID**: ADMIN

- **Description**: Administrative overhead

- **Type**: *Fixed*

- **Cost Rate**: 15.00

- **Account**: *51050*

4. Add another row for the floor setup overhead costs, and specify the following settings in the columns of the added row:

- **Overhead ID**: FLOOR

- **Description**: Floor setup overhead

- **Type**: *Variable by Quantity Completed*

- **Cost Rate**: 0.05

- **Account**: *51150*

5. Add one more row for the payroll overhead costs, and specify the following settings in the columns of the added row:

- **Overhead ID**: PAYROLL

- **Description**: Payroll overhead

- **Type**: *Variable by Labor Cost*

- **Cost Rate**: 0.30

- **Account**: *51150*

6. On the form toolbar, click **Save**.

Step 3: Creating Tools

To create tools for the screwdriver and hammer that will be used in the juicer assembly process, do the following:

1. Open the *Tools* (AM205500) form.

2. On the form toolbar, click **Add New Record**.

3. For the screwdriver tool, in the Summary area, specify the following settings:

   - **Tool ID**: `SCREWDRIVER`

   - **Description**: `Electric screwdriver`

   - **Active**: Selected

4. In the **Cost** section of the **General** tab, specify the following settings:

   - **Unit Cost**: `0.20`

   - **Total Cost**: `200`

5. In the **Account Settings** section, select *51070* in the **Account** box.

6. On the form toolbar, click **Save**.

7. On the form toolbar, click **Add New Record**.

8. In the Summary area, specify the following settings for the hammer tool:

   - **Tool ID**: `HAMMER`

   - **Description**: `Hammer`

   - **Active**: Selected

9. In the **Cost** section of the **General** tab, specify the following settings:

   - **Unit Cost**: `0.02`

   - **Total Cost**: `25`

10. In the **Account Settings** section, select *51070* in the **Account** box.

11. On the form toolbar, click **Save**.

Step 4: Creating a Machine

You will create a record for the injection molding machine with the standard cost of $25 per hour and 100% efficiency. The machine will work during the standard working hours. Do the following:

1. Open the *Machines* (AM204500) form.

2. On the form toolbar, click **Add New Record**.

3. In the Summary area, specify the following settings:

   - **Machine ID**: `INJMOLD`

   - **Active**: Selected

   - **Description**: `Injection molding machine`

   - **Down**: Cleared

4. On the **Info** tab of the form, specify the following settings:

   - **Standard Cost**: 25

   - **Calendar ID**: *MAIN*

   - **Efficiency**: 1.00

   - **Account**: *51060*

5. On the form toolbar, click **Save**.

You have created records for the labor codes, tools, overhead entities, and machines, and now you can create work centers.

Lesson 3: Managing Work Centers

Work Centers: General Information

In Acumatica ERP Manufacturing Edition, a work center corresponds to a physical or virtual location in a warehouse or production facility. The work center is a required component of configuring bills of material because it determines the availability of processes as well as the costing from overhead, labor, and machines. You use the *Work Centers* (AM207000) form to create work centers and manage settings of existing work centers.

In this topic, you will read about the configuration of work centers in Acumatica ERP Manufacturing Edition.

Learning Objectives

In this chapter, you will learn how to do the following:

- Create a work calendar for overtime work

- Create shifts that will be used in work centers

- Create the work centers that will be involved in manufacturing

Applicable Scenarios

You create work centers in the following cases:

- When you initially implement Acumatica ERP and the *Manufacturing* feature is included in your license

- When you have purchased the *Manufacturing* feature, and you need to configure manufacturing in the existing system

- When you need to add new work centers or change the settings of existing work centers due to business process changes

Work Center Creation

A work center must be created on the *Work Centers* (AM207000) form before you can create bills of material that use the work center. Once you have created any bills of material with a work center, on the **Where Used** tab of this form, you can view the bills of material that use the selected work center. You cannot delete a work center if it is used in any bill of material. Before deleting a work center, we recommend that you open the **Where Used** tab to make sure no bills of material use the work center.

For each work center you create, you specify the following:

- The warehouse where the work center is located (required): You must assign each work center to a warehouse.

- The standard cost per labor hour (optional): You specify this setting so that the system calculates the planned labor costs for the manufacturing process in which the work center is involved.

- The planned capacity of the work center (required): You specify whether the capacity constraint for scheduling should be the crew size or the machines. The basis for capacity determines whether the operation is scheduled by using run times or machine times; setup time is always used.

- The default scrap action (optional): You specify how the system should handle production scrap in the work center. For more information about scrap, see *Handling Production Scrap and Waste*.

- The default settings for the labor or material backflushing (optional): You define whether backflushing will be used in the work center. These settings are used by default when a user adds new operations and materials to a bill of material. For details on backflushing, see *Backflushing Concepts*.

- All shifts used to calculate work time in the work center (required): You add the shifts used in the work center so that the system determines the availability of work center resources (such as employees and machines) for production needs. A shift can contain information about additional payments to employees for overtime work. You must add at least one shift to the work center.

> ⚠ The labor cost is based on the first shift record found and not all of the shift records on the work center.

- The work calendar (required): You specify the calendar that defines the working hours of the work center for a particular shift.

- The labor code (required): You specify the labor code that defines the labor offset account when labor is entered or backflushed. For more information about labor costs, see *Backflushing Concepts* and *Labor Reporting*.

- All applicable overhead rates (optional): You add overhead rates to the work center to apply additional fixed or variable overhead costs to production. For details on overhead costs, see *Production Cost Drivers: General Information*.

- All applicable machine rates (optional): If machines are involved in the manufacturing process, you add the rates for these machines to apply these costs to production. For details on machine costs, see *Production Cost Drivers: General Information*.

- An indicator of whether the work center is dedicated for outside processing (optional): A work center can be created for an outside process, which is performed on a vendor side, but you may need to use the information specified in the work center in the bill of material. For more information about outside processing, see *Outside Processing*.

- Substitute work centers (optional): If the same items can be produced in multiple work centers assigned to different warehouses, you can specify the substitute work centers. For more information, see *Work Centers: Substitution of Work Centers*.

Work Centers: Configuration Prerequisites

Before starting to create work centers, you must be sure that the system has been configured properly and that all required entities have been created, as described in the following sections.

Enabling the Needed Feature

On the *Enable/Disable Features* (CS100000) form, the *Manufacturing* feature must be enabled.

Configuring the System

You need to make sure the following tasks have been performed in Acumatica ERP before you begin to create work centers:

● On the *BOM Preferences* (AM101000) form, the numbering sequence for bills of material has been specified.

● On the *Production Preferences* (AM102000) form, the numbering sequences for move, material, labor, cost, and WIP adjustments have been specified.

● On the *Work Calendar* (CS209000) form, the work calendars that will be used with work centers have been created. For an example of the creation of a work calendar, see *Work Centers: Implementation Activity*.

● On the *Shifts* (AM205000) form, the shifts for the work centers have been created. For an example of the creation of a shift, see *Work Centers: Implementation Activity*.

● On the *Labor Codes* (AM206500) form, the labor codes to be used for calculating the labor costs of any work center have been created. For an example of the defining of a labor code, see *Production Cost Drivers: Implementation Activity*.

● If overhead is to be used, on the *Overhead* (AM202500) form, the overhead rates to be used for any of the work centers have been created. For an example of the creating of an overhead entity, see *Production Cost Drivers: Implementation Activity*.

● If machines are to be scheduled or used for costing, on the *Machines* (AM204500) form, the machines to be used in any of the work centers have been created. For an example of the defining of a machine, see *Production Cost Drivers: Implementation Activity*.

Work Centers: Implementation Activity

In the following implementation activity, you will learn how to create a work calendar, shifts, and work centers.

Story

Suppose that SweetLife Fruits & Jams has decided to assemble customized juicers according to customers' needs. Assembly will take place in the Workhouse warehouse of the Service and Equipment Sales Center branch, in a specific work center. Two workers and a manager will be involved in the assembly process, and no machines will be used in this work center. Administrative and payroll overhead costs must be included in the production costs for this work center. Normally, workers will work in the standard shift, but sometimes overtime work will be required. Standard working hours are from Monday to Friday, 10:00 AM to 6:00 PM. Overtime work is from Monday to Friday, 6:00 PM to 9:00 PM.

In a separate work center, an injection molding machine has been installed, which will be used for producing small plastic parts required for juicers. The machine will be used during the standard schedule. One worker will operate the machine during the working hours.

As an implementation manager, you need to create a work calendar for overtime (a work calendar already exists for standard working hours), shifts for standard working hours and for overtime, and work centers for juicer assembly and for the injection molding machine.

Configuration Overview

The following entities, which you will use in this activity, have been predefined in the *U100* dataset:

- On the *Warehouses* (IN204000) form, the *WORKHOUSE* warehouse

- On the *Work Calendar* (CS209000) form, the *MAIN* work calendar, which is used for standard working hours

Process Overview

In this activity, you will do the following:

1. On the *Work Calendar* (CS209000) form, you will create a work calendar for overtime work.

2. On the *Shifts* (AM205000) form, you will create shifts for standard working hours and for overtime work.

3. On the *Work Centers* (AM207000) form, you will create work centers for juicer assembly and for the injection molding machine.

System Preparation

Before you start performing the activity, do the following:

1. As a prerequisite to the current activity, complete *Production Cost Drivers: Implementation Activity* so that the needed machine, overhead entities, and labor codes have been created in a company with the *U100* dataset preloaded.

2. Sign in to this company (that is, the company in which the prerequisite activity has been performed) as a system administrator with the *gibbs* username and *123* password.

3. Make sure that the *Manufacturing* feature has been enabled on the *Enable/Disable Features* (CS100000) form.

Step 1: Creating a Work Calendar

To create a work calendar for overtime, do the following:

1. Open the *Work Calendar* (CS209000) form.

2. On the form toolbar, click **Add New Record**.

3. In the **Calendar ID** box of the Summary area, type OVERTIME.

4. In the **Description** box, type Calendar for overtime.

5. In the **Time Zone** box, select *(GMT -05:00) Eastern Time (US & Canada)*.

6. On the **Calendar Settings** tab, do the following:

   a. In the **Day of Week** column, make sure that the check boxes are selected for **Monday**, **Tuesday**, **Wednesday**, **Thursday**, and **Friday**.

   b. In the **Start Time** box for each of the selected days of week, select *6:00 PM*.

   c. In the **End Time** box for each of the selected days of week, select *9:00 PM*.

7. On the form toolbar, click **Save**.

You have created a work calendar for overtime, which you will use in the work center settings along with the shift for overtime work.

Step 2: Creating Shifts

You will create a shift for standard working time and a shift for overtime work. Do the following:

1. Open the *Shifts* (AM205000) form.

2. On the form toolbar, click **Add Row** to add a shift for standard working time.

3. In the columns of the added row, specify the following settings:

- **Shift**: 0001
- **Description**: Monday - Friday
- **Diff Type**: *Amount*
- **Shift Diff**: 0

4. On the form toolbar, click **Save**.

5. On the form toolbar, click **Add Row** to add a shift for overtime.

6. In the columns of the added row, specify the following settings:

- **Shift**: 0002
- **Description**: Overtime
- **Diff Type**: *Rate*
- **Shift Diff**: 1.5

7. On the form toolbar, click **Save**.

You have created shifts for standard working time and for overtime, and now you can create the needed work centers.

Step 3: Creating a Work Center for Juicer Assembly

To create a work center where the assembly of juicers will be performed, do the following:

1. Open the *Work Centers* (AM207000) form.

2. On the form toolbar, click **Add New Record**.

3. In the Summary area, specify the following settings:

- **Work Center**: WCR10
- **Description**: Work center for assembly of juicers
- **Active**: Selected

- **Outside Process**: Cleared

- **Warehouse**: *WORKHOUSE*

- **Standard Cost**: *20*

- **Basis for Capacity**: *Crew Size*

- **Scrap Action Default:** *No Action*

- **Backflush Materials**: Cleared

- **Backflush Labor**: Cleared

4. On the **Shift Info** tab, do the following:

   a. Make sure that the row for the *0001* shift has been added. (The row for the first shift is always added automatically because the work center must have at least one shift.)

   b. In this row, specify the following:

      - **Crew Size**: 2

      - **Machines**: 0

      - **Efficiency**: 1

      - **Calendar ID**: *MAIN*

      - **Labor Code**: *DIRLAB*

         You created this labor code in *Production Cost Drivers: Implementation Activity*.

      Make sure that the values in the **Diff Type** and **Shift Diff** columns (*Amount* and *0.0000*, respectively) have been copied from the shift settings on the *Shifts* (AM205000) form.

   c. On the table toolbar, click **Add Row**.

   d. In this row, specify the following:

      - **Shift**: *0002*

      - **Crew Size**: 1

      - **Machines**: 0

      - **Efficiency**: 1

      - **Calendar ID**: *OVERTIME*

      - **Labor Code**: *DIRLAB*

      Make sure that the values in the **Diff Type** and **Shift Diff** columns (*Rate* and *1.5000*, respectively) have been copied from the shift settings on the *Shifts* form.

5. On the **Overhead** tab, do the following:

   a. On the table toolbar, click **Add Row**.

   b. In the **Overhead ID** column, select *ADMIN* to add the administrative overhead to the production cost.

      You created this overhead entity in *Production Cost Drivers: Implementation Activity*.

   c. In the **Factor** column, type 1.

   d. On the table toolbar, click **Add Row**.

   e. In the **Overhead ID** column, select *PAYROLL* to add the payroll overhead to the production cost.

      You created this overhead entity in *Production Cost Drivers: Implementation Activity*.

   f. In the **Factor** column, type 1.

6. On the form toolbar, click **Save**.

You have created the work center that will be involved in the process of juicer assembly.

Step 4: Creating a Work Center for a Machine

While remaining on the *Work Centers* (AM207000) form, you will create a work center for the injection molding machine. Do the following:

1. On the form toolbar, click **Add New Record**.

2. In the Summary area, specify the following settings:

- **Work Center**: WCR20
- **Description**: Work center for the injection molding machine
- **Active**: Selected
- **Outside Process**: Cleared
- **Warehouse**: *WORKHOUSE*
- **Standard Cost**: *15*
- **Basis for Capacity**: *Machines*
- **Scrap Action Default:** *No Action*
- **Backflush Materials**: Cleared
- **Backflush Labor**: Cleared

3. On the **Shift Info** tab, do the following:

   a. Make sure that the row for the *0001* shift has been added.

   b. In this row, specify the following:

- **Crew Size**: 1
- **Machines**: 1

- **Efficiency**: 1

- **Calendar ID**: *MAIN*

- **Labor Code**: *DIRLAB*

Make sure that the values in the **Diff Type** and **Shift Diff** columns (*Amount* and *0.0000*, respectively) have been filled automatically with the values specified in the shift settings on the *Shifts* (AM205000) form.

4. On the **Overhead** tab, do the following:

   a. On the table toolbar, click **Add Row**.

   b. In the **Overhead ID** column, select *FLOOR* to add the administrative overhead to the production cost.

   You created this overhead entity in *Production Cost Drivers: Implementation Activity*.

   c. In the **Factor** column, type 1.

5. On the **Machines** tab, do the following:

   a. On the table toolbar, click **Add Row**.

   b. In the **Machine ID** column, select *INJMOLD*.

   You created this machine in *Production Cost Drivers: Implementation Activity*.

   c. Make sure that the value in the **Standard Cost** column has been copied from the **Standard Cost** box on the *Machines* (AM204500) form.

6. On the form toolbar, click **Save**.

You have created a work center for the injection molding machine.

Lesson 4: Managing Bills of Material

Bills of Material: General Information

In Acumatica ERP Manufacturing Edition, by using bills of material (BOMs), your organization can create production specifications and plan your manufacturing processes. In a bill of material, you directly connect materials, work instructions, tools, attributes, and overhead costs to an operation. Bills of material provide for revision tracking, phantom assemblies, backflushing of both labor and materials, material effectiveness dates, by-products, and alternate bills of material. You create bills of material by using the *Bill of Material* (AM208000) form.

In this topic, you will read about bills of material.

Learning Objectives

In this chapter, you will learn how to do the following:

- Prepare the system for the creation of bills of material

- Create and activate a bill of material

Applicable Scenarios

You configure the system for the use of bills of material in the following cases:

- When you initially implement Acumatica ERP, and the *Manufacturing* feature, which is enabled on the *Enable/Disable Features* (CS100000) form, is included in your license

- When you have purchased the *Manufacturing* feature, and you need to configure manufacturing in the existing system

- When you need to add new bills of material or change the settings of existing bills of material due to business process changes

Bills of Material and Stock Items

A bill of material is a document that details the production process of a single stock item and defines the operations and materials required to build one base unit of the stock item. Before you start creating a bill of material, you must create the stock item on the *Stock Items* (IN202500) form.

If a stock item is stored in a single warehouse or it is stored in multiple warehouses but its manufacturing-specific settings do not differ in each, you specify the item's manufacturing-specific settings on the **Manufacturing** tab of the *Stock Items* form. If the stock item is stored in multiple warehouses and its manufacturing-specific settings depend on the warehouse, you specify these settings on the **Manufacturing** tab of the *Item Warehouse Details* (IN204500) form for each item–warehouse pair after defining the stock item on the *Stock Items* form.

A stock item may have multiple BOMs assigned, but only one BOM can be specified in the **Default BOM ID** box on the **Manufacturing** tab of the *Stock Items* or *Item Warehouse Details* form.

If the stock item is produced in standard lots, you can specify the lot size in the **Lot Size** box of the **Manufacturing** tab on the *Stock Items* or *Item Warehouse Details* form. The lot size becomes the default for planned orders and production orders and is used in the cost roll process on the *Cost Roll*

(AM508000) form. On the *Estimate* (AM303000) form, the **Order Qty.** on the **Totals** tab is used as the lot size.

Bill of Material Settings

You create bills of material by using the *Bill of Material* (AM208000) form. The settings of a bill of material include the following:

- Bill of material identifier: If the numbering sequence used for the identifier is configured to be entered manually, you type it into the **BOM ID** box according to numbering conventions used in your organization. Otherwise, the system generates this identifier automatically according to the settings of the numbering sequence and inserts it into the box. For more information, see *BOM Identifiers*.

- Revision: In the **Revision** box, you specify the BOM revision. For more information about BOM revisions, see *BOM Revisions*.

- Identifier of the stock item: You specify the identifier of the stock item that will be produced in the **Inventory ID** box.

- Warehouse: In the **Warehouse** box, you specify the warehouse in which the production of items detailed in the bill of material will take place.

- Start date: You enter the date when the BOM revision becomes effective in the **Start Date** box.

- End date: In the **End Date** box, you enter the date when this revision of the bill of material will no longer be effective. This setting is optional.

- Operations: In the Operations table below the Summary area, you add the operation or operations (one in each row) that will be performed during the production of items based on the bill of material. You add operations in the order in which they will be performed in the production. For more information, see *Bills of Material: Operations*.

You can also specify attributes for a bill of material by using the *BOM Attributes* (AM208500) form.

BOM Identifiers

The identifier of the bill of material, in the **BOM ID** box of the *Bill of Material* (AM208000) form, can be up to 15 characters. The format of the bill of material ID is determined by the numbering sequence that is created by using the *Numbering Sequences* (CS201010) form and specified on the *BOM Preferences* (AM101000) form (in the **BOM Numbering Sequence** box of the **General Settings** tab). As with all numbering sequences in Acumatica ERP, you may have different sequences for each branch. You may choose automatic numbering or manual entry of identifiers. You may prefer to type in the **BOM ID** box the inventory ID of the stock item that is produced by using the bill of material (as long as the inventory ID is fewer than 15 characters).

If you want to have multiple bills of material for a warehouse because of alternate production methods, you might consider using manual numbering for the BOM ID and use a suffix to indicate the method.

> (i) When you are importing bills of material, we recommend that you generate a sequence in your import data to reflect the format of the BOM ID; then as the **BOM Numbering Sequence** on the *BOM Preferences* form, you need to select a numbering sequence for which the **Manual Numbering** check box is selected on the *Numbering Sequences* form.

BOM Revisions

The revision entered into the **Revision** box of the *Bill of Material* (AM208000) form is the version of the bill of material. When you initially create a bill of material, this BOM also serves as the first revision of this BOM. You can create as many revisions as you need for the same BOM ID. In the **Default Revision** box on the *BOM Preferences* (AM101000) form, you specify the default revision identifier to be inserted in the **Revision** box for the first revision of all BOMs created in the system. When creating a BOM, you can change the default revision identifier.

> ⚠️ If you use engineering change control, you can manage BOM revisions by using engineering change orders or requests. To indicate this, you select the **Prevent New Revisions Without ECR** check box on the *BOM Preferences* form. For details about engineering change control, see *Engineering Change Control: General Information*.

A BOM revision can have one of the following statuses, which are specified in the **Status** box of the *Bill of Material* form:

- *On Hold*: The revision is not active and you can make changes in the bill of material. To assign this status to a revision, you click **Hold** in the Summary area of the *Bill of Material* form.

- *Active*: The revision can be used for production and planning. You cannot make changes to a BOM revision with this status. Multiple revisions can be active at the same time. The default revision is the active revision that was created most recently; this revision is used for production orders and for planning orders.

- *Archived*: The revision has been archived and is not effective any more.

You can change the revision status at any time.

To create a new revision of a particular bill of material, you do the following:

1. In the **BOM ID** box on the *Bill of Material* form, select the BOM for which you want to add a new revision.

2. In the **Revision** box, type the revision identifier to be used for the new revision.

3. Make all the needed changes to the BOM and click **Save** on the form toolbar.

When you create an additional BOM revision, the system copies all settings (including all attributes, notes, and attachments) of the most recently created revision to the new revision.

You can delete a BOM revision only when the revision is not the source for a production order or product configuration, and when the revision is not referenced in a bill of material or production material.

You can archive a BOM revision by using the **Archive BOM** action on the form toolbar of the *Bill of Material* form. Archiving a bill of material sets the **End Date** to the current business date. You can select the **Hold** check box for a revision with a status of *Archived* to edit it again. When you clear the **Hold** check box, the system changes the status of the revision to *Active*.

Multilevel BOMs

Bills of material become multilevel when a subassembly (that is, another BOM) is used as a component in another assembly or subassembly. The complete structure, from finished goods down through each subassembly down to raw materials, is referred to a multilevel bill of material.

To make a BOM multilevel, you do the following:

1. On the *Stock Items* (IN202500) form, you create a stock item that represents the subassembly.

2. On the *Bill of Material* (AM208000) form, you create a bill of material for this stock item.

3. On the same form, you create a multilevel BOM, specify all required settings, and, on the **Materials** tab for an operation that uses the subassembly, you add a row for the stock item.

Bills of Material: Operations

Operations are an essential part of a bill of material (BOM). When you create a bill of material or change an existing BOM on the *Bill of Material* (AM208000) form, you must add at least one operation to the Operations table.

In this topic, you will read about operations for bills of material.

Operations in Bills of Material

Each operation is assigned to a work center and represents the activities performed in this work center. In the Operations table of the *Bill of Material* (AM208000) form, you list the included operations in the order in which they will be performed during production.

In this table, you specify the following for each operation:

- Operation identifier, which you specify manually in the **Operation ID** column. For details, see *Operation Identifiers*.

- The work center where the operation will be performed, which you specify in the **Work Center** column. The work center provides the standard labor cost per working hour.

- The time for preparing to start the operation, which you specify in the **Setup Time** column.

- The quantity of item units produced and the particular time in which the units are produced; you specify the quantity of item units in the **Run Units** column and the time in the **Run Time** column. For example, suppose that an operation requires 1 hour and 20 minutes to produce 1000 gallons of a liquid; the run units would be *1000* and the run time would be *01:20*.

- If a machine is involved in the operation, the quantity of item units produced by using the machine and the particular time; you specify the quantity of item units in the **Machine Units** column and the time in the **Machine Time** column.

- The waiting time in the work center to start the operation, which you specify in the **Queue Time** column.

- Labor backflushing setting, which is represented by the **Backflush Labor** check box, that indicates whether labor should be backflushed. For more information, see *Backflushing Concepts*.

- The default scrap action for the operation that will be copied to the new production order, which you specify in the **Scrap Action** column. For more details about scrap, see *Handling Production Scrap and Waste*.

For each operation in the Operations table, you can specify the materials, steps, tools, overhead, and outside process settings included in the selected operation. To do this, you click the operation in the table and then you specify the settings on the dedicated tabs below the table.

For each operation, you specify the following:

- Materials, which are the stock or non-stock items that will be used in the operation. For more information, see *Materials Used in Operations*.

- Steps into which the operation is divided. The steps are used only by workers to understand the sequence of actions within the operation.

  Steps can be printed by using the *Production Ticket* (AM625000) report.

- Tools that are involved in the operation and whose cost you would like to include in the production cost. For details, see *Production Cost Drivers: General Information*.

- Product-specific overhead costs that must be considered when the system calculates costs for the operation. Overhead costs are usually specified for a work center instead of for a bill of material. For more information, see *Production Cost Drivers: General Information*.

- Outside process settings, if the operation is involved in an outside process. For details, see *Outside Processing*.

Operation Identifiers

We recommend that you consider the following points regarding the operation identifiers, which are specified in the **Operation ID** column of the Operations table:

- You should assign operation IDs to provide the ability to add new operations between the two existing operations; that is, do not assign operations contiguous numbers as IDs, because this would not give you the ability to use an ID between those IDs. For example, suppose that initially a bill of material includes three operations. You specify the operation identifiers as *010*, *020*, and *030*. Further suppose that a new operation must be performed between the first and second operations. You can use the *015* ID for this operation.

- You should not use leading spaces.

- If you use preceding zeros, you should keep in mind that operations are sorted as text when you order operations in the list.

- You can change the operation identifiers at any time.

- Some common examples of identifiers for operations are the following:

  - 010, 020, 030, and so on

  - 100, 110, 120, and so on

  - 0010, 0020, 0030, and so on

> ⚠️ The system regenerates operation numbers when a user creates a production order from the bill of material. The numbering starts with *0010* and uses increments of 10.

Materials Used in Operations

Materials are the stock or non-stock items used to produce one base unit of an item. On the **Materials** tab of the *Bill of Material* (AM208000) form, you add the materials that are used when a worker performs the particular operation selected in the Operations table.

Two system settings for bills of material, which are specified on the **General Settings** tab (**Data Entry Settings** section) of the *BOM Preferences* form (AM101000) affect the entry of items that are used more than once in an operation and are used multiple times in different operations of the bill of material. If in the production process, the same items can be used in the same operation multiple times (and you need to add a separate line for each of the items), the **Duplicates on Operation** check box on this) form. If the same items can be added to different operations of the same bill of material, the **Duplicates on BOM** check box should be selected.

For each item added to the **Materials** tab, you specify the identifier of a stock or non-stock item that represents the material and the quantity of the item required for the operation. The quantity is defined by values of the **Qty. Required**, **Batch Size**, and **UOM** columns, as described in *Calculation of the Quantity of Material Required for Production*.

Calculation of the Quantity of Material Required for Production

When a user creates a production order for a bill of material, the system calculates the quantities of the materials required for production. The required quantity of each item listed on the **Materials** tab of the *Bill of Material* (AM208000) form is based on the combination of the **Qty. Required** and **Batch Size** settings as follows:

- If the required quantity does not depend on the quantity of the items being produced, you specify 0 in the **Batch Size** column and the needed quantity in the **Qty. Required** column.

- If the required quantity is calculated based on the quantity of the items being produced, you specify 1 in the **Batch Size** column and the quantity required to produce one unit of the item in the **Qty. Required** column.

- If the material is supplied in units of measure other than the base unit of measure (such as boxes with 10 units), you specify the multiplier for the base unit of measure in the **Batch Size** column and the needed quantity in the **Qty. Required** column. In this case, the system will divide the value specified in the **Qty. Required** column by the batch size.

> ⚠️ The **Batch Size** column is hidden from the **Materials** tab by default. The default value of the batch size is *1*.

For the item being produced, if the lot size specified in the **Lot Size** box on the **Manufacturing** tab of the *Stock Items* (IN202500) form is more than 1, the system multiplies the required quantity specified in the **Qty. Required** column on the **Materials** tab of the *Bill of Material* form by the lot size in production orders and planned orders.

Suppose that for producing of one 32-ounce jar of apple jam, 2 pounds of apples and 1 pound of sugar are required. Sugar is supplied in packages that contain 5 bags with 1 pound in each. Also, workers use 0.8 liquid ounces of dish-washing liquid for washing a pan after each brewing cycle. Further suppose that a production order is created for producing 10 jars of apple jam. In the following table, you can find the example of how the system calculates the required material quantity for the production order depending on the BOM settings.

Table: Example of calculating the required quantity of materials

Material	Required Quantity	Batch Size	Total Quantity
Apples	2 pounds	1	20 pounds
Sugar	5 pounds	5	10 pounds

Material	Required Quantity	Batch Size	Total Quantity
Dish-washing liquid	0.8 liquid ounces	0	0.8 liquid ounces

Bills of Material: Configuration Prerequisites

Before starting to create a bill of material, you must be sure that the system has been configured properly and that all required entities have been created, as described in the following sections.

Enabling the Needed Feature

On the *Enable/Disable Features* (CS100000) form, the *Manufacturing* feature must be enabled.

Configuring the System

You need to make sure the following tasks have been performed in Acumatica ERP before you begin to create bills of material:

- On the *BOM Preferences* (AM101000) form, the preferences for bills of material have been specified.

- On the *Stock Items* (IN202500) form, the stock items that will be manufactured by using the bill of material, as well as the items that will be used as materials for manufacturing, have been created and configured properly.

- On the *Warehouses* (IN204000) form, the warehouses where production will be performed, and those where stock items will be received and issued, have been defined.

- On the *Work Centers* (AM207000) form, the work centers that will be used to perform the operations included in the bill of material have been created.

- On the *Tools* (AM205500) form, the tools that will be involved in production by using the bill of material have been created.

- On the *Overhead* (AM202500) form, the process-specific overhead entities have been created, and rates have been specified for each of them.

Bills of Material: Implementation Activity

In the following implementation activity, you will learn how to create a bill of material (BOM).

Story

Suppose that SweetLife Fruits & Jams has decided to assemble customized juicers according to customers' specifications. Assembly will take place in the Workhouse warehouse of the Service and Equipment Sales Center branch, in a specific work center. The process of assembling a juicer consists of one assembly operation, and requires juicer parts as materials, and a hammer and screwdriver as tools. Overhead costs have been specified at the work center level; you do not need to specify them on the bill of material. In the work center, two workers are involved in juicer assembly. Each worker produces three juicers per hour.

As an implementation manager, you will create the bill of material for the assembly process of the configurable juicer for citrus fruits.

Configuration Overview

The following entities, which you will use in this activity, have been predefined in the *U100* dataset:

- On the *Warehouses* (IN204000) form, the *WORKHOUSE* warehouse

- The following items on the *Stock Items* (IN202500) form: *CFJCITRUS*, *JCREAMER*, *JUICECUP1L*, *MRBASEHIGH*, *STRBASKET*, and *SPLGUARD*

Process Overview

On the *Bill of Material* (AM208000) form, you will create the bill of material for the configurable juicer for citrus fruits. You will add the assembly operation, which is performed in the dedicated work center. Then you will add materials, steps, and tools for the operation. Finally, you will make the bill of material active and default for the juicer stock item.

System Preparation

Before you start performing the activity, do the following:

1. As a prerequisite to the current activity, complete *Production Cost Drivers: Implementation Activity* so that the needed tools have been created in a company with the *U100* dataset preloaded.

2. As a prerequisite to the current activity, complete *Work Centers: Implementation Activity* so that the needed work center has been created in this company.

3. Sign in to this company (in which the prerequisite activities have been performed) as a system administrator with the *gibbs* username and *123* password.

4. Make sure that the *Manufacturing* feature has been enabled on the *Enable/Disable Features* (CS100000) form.

Step 1: Creating a Bill of Material

To create a bill of material, do the following:

1. Open the *Bill of Material* (AM208000) form.

2. On the form toolbar, click **Add New Record**.

3. In the Summary area, specify the following settings:

    - **Revision**: A

    - **Hold**: Selected

    - **Inventory ID**: *CFJCITRUS*

    - **Warehouse**: *WORKHOUSE*

    - **Start Date**: Today's date

    - **End Date**: Empty

    - **Description**: A bill of material for assembly of configurable juicers for citrus fruits

4. On the form toolbar, click **Save**.

Step 2: Adding an Operation

To add the assembly operation to the bill of material, do the following:

1. On the toolbar of the Operations table, click **Add Row**.

2. In the row, specify the following settings:

- **Operation ID**: 010

- **Work Center**: *WCR10*

  You created this work center in *Work Centers: Implementation Activity*.

- **Setup Time**: 00:30

- **Run Units**: 6

- **Run Time**: 01:00

3. On the form toolbar, click **Save**.

Step 3: Adding Materials

To add the materials required for the operation, do the following:

1. In the Operations table, click the row with the *010* operation.

2. In the lower part of the form, click the **Materials** tab.

3. On this tab, add rows for the stock items listed in the following table, specifying the listed settings for each.

Inventory ID	Qty. Required
JCREAMER	1
JUICECUP1L	1
MRBASEHIGH	1
STRBASKET	1
SPLGUARD	1

4. On the form toolbar, click **Save**.

Step 4: Adding the Steps

To add steps required to perform the operation, do the following:

1. On the **Steps** tab, add rows for the steps, and enter the following text in the **Description** column of each row in the listed order:

a. Attach the strain basket to the motor base.

   b. `Attach the reamer to the strain basket.`

   c. `Attach the 1-liter juice cup to the motor base.`

   d. `Attach the splash guard.`

   a. On the form toolbar, click **Save**.

Step 5: Adding the Tools

To add the tools involved in the assembly process, which you created in *Production Cost Drivers: Implementation Activity*, to the operation settings, do the following:

1. On the **Tools** tab, add rows for the tools listed in the following table, specifying the listed settings for each.

Tool ID	Qty. Required
HAMMER	2
SCREWDRIVER	2

2. On the form toolbar, click **Save**.

Step 6: Activating the Bill of Material

To make the created bill of material active and specify it as the default bill of material for the *CFJCITRUS* item, do the following:

1. In the Summary area, clear the **Hold** box. The status is changed to *Active*.

2. On the form toolbar, click **Save**.

3. On the form toolbar, click **Actions > Make Default BOM**.

4. In the **Default BOM Levels** dialog box, which opens, do the following:

   a. Make sure that the **Item** and **Warehouse** check boxes are selected.

   b. Click **Update**.

   The system inserts *BOM000001* in the **Default BOM ID** box of the **Manufacturing** tab of the following forms:

   ● The *Stock Items* (IN202500) form for the *CFJCITRUS* item

   ● The *Item Warehouse Details* (IN204500) form for the *CFJCITRUS* item and *WORKHOUSE* warehouse pair

You have created the bill of material for the configurable juicer for citrus, made it active and default for the stock item that represents the juicer.

Lesson 5: Configuring Production Order Types

Production Order Types: General Information

In Acumatica ERP Manufacturing Edition, a production order type provides default settings for production orders of the type and determines the workflow for these production orders. You use the *Production Order Types* (AM201100) form to create production order types, which are described further in this topic.

Learning Objectives

In this chapter, you will learn how to create a production order type for each of the following categories of production orders: regular, planning, and assembly.

Applicable Scenarios

You configure production order types in any of the following cases:

- When you initially implement Acumatica ERP and the *Manufacturing* feature, which is enabled on the *Enable/Disable Features* (CS100000) form, is included in your license

- When you have purchased the *Manufacturing* feature, and you need to configure manufacturing in the existing Acumatica ERP system

- When you need to add new production order types or change the settings of existing order types due to business process changes

Settings of Production Order Types

When you create a production order type, you specify the following settings for it on the *Production Order Types* (AM201100) form:

- The function of production orders of the type, which determines the workflow. For details, see the *Functions of Production Order Types* section.

- The Work in Process and WIP Variance GL accounts. For more information, see the *GL Accounts for Production Order Types* section.

- The cost calculation methods for produced items in production orders of the type. For details, see the *Cost Calculation for Produced Items* section.

- The scrap settings to be used for production orders of the type. For more information, see *Handling Production Scrap and Waste*.

- The settings of data entry validation that apply to orders of the type. For more information, see the *Data Entry Validation on Production Orders* section.

- The attributes that users specify for production orders of the type. For details, see the *Attributes of Production Orders* section.

The settings of a production order type are inserted or used when a new production order is created on the *Production Order Maintenance* (AM201500) form and the type is selected in the **Order Type** box.

⚠️   You cannot change the order type in a production order once the order has been created.

Functions of Production Order Types

The workflow of a production order in the system depends on the function specified in the production order type assigned to the production order. The following functions are available in the **Function** box of the *Production Order Types* (AM201100) form:

- *Regular*: The production order is used to produce items.

  You can specify a default order type with this function in the **Default Order Type** box of the *Production Preferences* (AM102000) form. If you do, when a new production order is created on the *Production Order Maintenance* (AM201500) form and the *Regular* function is selected, this production order type is inserted, as are its default settings.

- *Planning*: The production order is used for planning purposes, such as reserving materials and capacity. Processing of an order with this function does not generate transactions, such as issue of materials or labor. The MRP regeneration process on the *Regenerate MRP* (AM505000) form also uses orders with this function, but these orders do not reserve materials and capacity.

  You can specify the default planning order type in the **Plan Order Type** box on the *MRP Preferences* form. If you do, when a new production order is created on the *Production Order Maintenance* (AM201500) form and the *Planning* function is selected, this production order type is inserted, as are its default settings.

- *Disassemble*: The production order is used to disassemble items.

  You can specify the default disassembly order type in the **Default Disassemble Order Type** box on the *Production Preferences* form. If you do, when a new production order is created on the *Production Order Maintenance* (AM201500) form and the *Disassemble* function is selected, this production order type is inserted, as are its default settings.

You can create as many production order types as you need but you must create at least one *Regular* order type and one *Planned* order type.

GL Accounts for Production Order Types

In each production order type, you can select a specific Work in Progress and WIP Variance GL accounts in the **Work in Process Account** and **WIP Variance Account** boxes on the *Production Order Types* (AM201100) form accordingly. The system uses these GL accounts for posting amounts only if the accounts are not specified in posting classes assigned to the stock items that are included in the production order of this type.

Cost Calculation for Produced Items

In the **Costing Method** box of the *Production Order Types* (AM201100) form, you specify the costing method to be used for production orders of the type. The costing method determines how the cost of produced items is calculated for items with the *Average*, *FIFO*, or *Specific* valuation methods. You can select one of the following costing methods:

- *Actual*: The actual balance of the Work in Process GL account is used to calculate the cost. This method is always used for disassembly orders. For other order types, we recommend that you use it only if you can ensure that during production processing, all materials and labor have been issued before the last operation move.

- *Estimated*: Actual and planned costs are combined during the cost calculation. We recommend that you use this method when material and labor transactions are not always reported before the inventory is receipted from the production order. This method is recommended for all regular and planning orders.

For production orders that include items with the *Standard* valuation method, the system specifies the *Standard* costing method, regardless of the costing method specified for the production order type assigned to the production order, and a user cannot change the costing method for the production order.

> ⚠ Before you select the costing method for a production order type, we recommend that you read detailed information about costing methods in *Costing Production Receipts*.

Data Entry Validation on Production Orders

A production order type provides settings that will help users minimize errors when they enter data to a production order assigned to this type; that is, the system can validate whether the appropriate quantity of items used as materials is specified in the production order and whether the production order has the appropriate status. You specify these settings in the **Data Entry Settings** section of the *Production Order Types* (AM201100) form.

Attributes of Production Orders

For a production order type, you can specify attributes for orders of the type, which may be informational or can require data entry. You first define the needed attributes on the *Attributes* (CS205000) form (if they do not already exist) and then add the attributes to the **Attributes** tab of the *Production Order Types* (AM201100) form.

The system can capture the values for the attributes from production attributes when a user reports production. These attributes are in addition to the attributes specified for the bill of material used to create the production order and the attributes used in the product configurator.

Production Order Types: Implementation Checklist

The following sections provide details you can use to ensure that the system is configured properly for creating production order types, and to understand (and change, if needed) the minimum required settings of a production order type.

The Needed Feature Enablement

You should make sure the *Manufacturing* feature has been enabled on the *Enable/Disable Features* (CS100000) form.

System Configuration

You need to make sure the following tasks have been performed in Acumatica ERP before you begin to create production order types:

- On the *Chart of Accounts* (GL202500) form, the Work in Process and WIP Variance GL accounts have been created.

- On the *Numbering Sequences* (CS201010) form, at least one numbering sequence for production orders has been created.

- On the *BOM Preferences* (AM101000) form, the system settings for bills of material have been specified.

- On the *Production Preferences* (AM102000) form, the numbering sequences for WIP adjustments, move, material, labor, and cost transactions have been specified.

For more information on configuring the system before you start to create order types, see *System Preparation for Manufacturing Implementation: General Information*.

Minimum Required Settings

For each production order type that you are going to use, you should specify the following minimum settings to configure and activate the order type on the *Production Order Types* (AM201100) form.

Location on the Form	Settings to Specify
Summary area	• The **Active** check box, indicating that the production order type is available for use, is selected. • The **Function**, which determines the workflow of production orders of this type, is selected.
General Settings tab	• The **Order Numbering Sequence**, which is the sequence to be used to assign order reference numbers, is specified. • The **Work in Process Account**, which is the account for posting item costs until the production order is closed, is specified. • The **WIP Variance Account**, which is the account for posting a difference between the cost of the produced item recorded to the Work in Progress account and the final cost of the produced item in the completed production order, is specified. • The **Costing Method**, which is the method for calculating item costs produced by using the production orders of the type, is selected.

Production Order Types: To Create a Regular Production Order Type

In the following implementation activity, you will learn how to create a production order type for regular production orders.

Story

Suppose that you are an implementation manager who needs to define production orders that will be used for producing items. You need to create the production order type that will generally provide the settings for these production orders, and define it as the default type for the orders.

Configuration Overview

The following entities, which you will use in this activity, have been predefined in the *U100* dataset:

- On the *Numbering Sequences* (CS201010) form, the *AMPROD* numbering sequence

- On the *Chart of Accounts* (GL202500) form, the *12400 - Work in Progress* and *51500 - COGS - WIP Inventory Variance* GL accounts

Process Overview

On the *Production Order Types* (AM201100) form, you will create an order type for regular production orders. Then on the *Production Preferences* (AM102000) form, you will specify this order type as the default order type for orders used for item production.

System Preparation

Before you start creating the order type, do the following:

1. As a prerequisite to the current activity, complete *System Preparation for Manufacturing Implementation: Implementation Activity* so that the needed settings have been made in a company with the *U100* dataset preloaded.

2. Sign in to this company (in which the prerequisite activity has been performed) as a system administrator with the *gibbs* username and *123* password.

3. Make sure that the *Manufacturing* feature has been enabled on the *Enable/Disable Features* (CS100000) form.

Step 1: Creating the Regular Production Order Type

To create the production order type for the regular production of items, do the following:

1. Open the *Production Order Types* (AM201100) form.

2. On the form toolbar, click **Add New Record**.

3. In the Summary area, specify the following settings:

   a. **Order Type**: RO

   b. **Active**: Selected

   c. **Description**: Regular production orders

   d. **Function**: *Regular*

4. On the **General Settings** tab, do the following:

   a. In the **Order Numbering Sequence** box of the **Numbering Settings** section, select *AMPROD*.

   b. In the **Account Settings** section, select the following accounts:

      - **Work in Process Account**: *12400*

      - **WIP Variance Account**: *51500*

    c. In the **Costing Method** box of the **Order Defaults** section, select *Estimated*.

    d. In the **Copy BOM Notes** section, select all the check boxes so that the system copies the notes to production orders of the type.

    e. In the **Data Entry Settings** section, specify the following settings:

- **Under Issue Material**: *Warn*

- **Under Issue Backflush Material**: *Do Not Allow*

- **Over Issue Material**: *Warn*

- **Include Unreleased Batch Qty.**: Selected

- **Issue Material Not on Order**: *Warn*

- **Move on Completed Operations**: *Warn*

- **Over Complete Orders**: *Warn*

- **Default Operation Move Qty.**: Selected

5. On the form toolbar, click **Save**.

Step 2: Specifying the Default Production Order Type in Preferences

Because you have created an order type for regular production orders, you will specify this type as the default type for these orders in the production settings. Do the following:

1. Open the *Production Preferences* (AM102000) form.

2. In the **Default Order Type** box of the **General Settings** tab (**Data Entry Settings** section), select *RO*.

3. On the form toolbar, click **Save**.

You have successfully created the production order type for the regular production of items and specified it as the default order type in the production settings.

Production Order Types: To Create a Planning Production Order Type

In the following implementation activity, you will learn how to create a production order type for production orders that will be used for planning.

Story

Suppose that you are an implementation manager who needs to define production orders that will be used to plan production. You need to create the order type that will generally provide the settings for these production orders, and define it as the default type for the orders.

Configuration Overview

The following entities, which you will use in this activity, have been predefined in the *U100* dataset:

- On the *Numbering Sequences* (CS201010) form, the *AMPROD* numbering sequence

- On the *Chart of Accounts* (GL202500) form, the *12400 - Work in Progress* and *51500 - COGS - WIP Inventory Variance* GL accounts

Process Overview

On the *Production Order Types* (AM201100) form, you will create an order type for planning orders. Then on the *MRP Preferences* (AM100000) form, you will specify this order type as the default order type for orders used for planning.

System Preparation

Before you start creating the order type, do the following:

1. As a prerequisite to the current activity, complete *System Preparation for Manufacturing Implementation: Implementation Activity* so that the needed settings have been made in a company with the *U100* dataset preloaded.

2. Sign in to this company (in which the prerequisite activity has been performed) as a system administrator with the *gibbs* username and *123* password.

3. Make sure that the *Manufacturing* feature has been enabled on the *Enable/Disable Features* (CS100000) form.

Step 1: Creating the Planning Production Order Type

To create the production order type for planning, do the following:

1. Open the *Production Order Types* (AM201100) form.

2. On the form toolbar, click **Add New Record**.

3. In the Summary area, specify the following settings:

   a. **Order Type**: PL

   b. **Active**: Selected

   c. **Description**: Planning orders

   d. **Function**: *Planning*

4. On the **General Settings** tab, do the following:

   a. In the **Order Numbering Sequence** box of the **Numbering Settings** section, select *AMPROD*.

   > ⚠ In a production system, we recommend that you create a separate numbering sequence for planning orders.

   b. In the **Account Settings** section, select the following accounts:

   - **Work in Process Account**: *12400*

   - **WIP Variance Account**: *51500*

     c. In the **Costing Method** box of the **Order Defaults** section, select *Estimated*

     d. In the **Copy BOM Notes** section, select all the check boxes so that the system copies the notes to production orders of the type.

5. On the form toolbar, click **Save**.

Step 2: Specifying the Default Planning Order Type

Because you have created an order type for planning orders, you will specify this type as the default type for planning in the material requirements planning (MRP) settings. Do the following:

1. Open the *MRP Preferences* (AM100000) form.

2. In the **Plan Order Type** box of the **General** section, select *PL*.

3. On the form toolbar, click **Save**.

You have successfully created the order type for planning and specified it as the default order type in the MRP settings.

Production Order Types: To Create a Disassembly Production Order Type

In the following implementation activity, you will learn how to create a production order type for disassembly production orders.

Story

Suppose that you are an implementation manager who needs to define production orders that will be used for disassembly. You need to create the production order type that will generally provide the settings for these production orders, and define it as the default type for the orders.

Configuration Overview

The following entities, which you will use in this activity, have been predefined in the *U100* dataset:

● On the *Numbering Sequences* (CS201010) form, the *AMDIS* numbering sequence

● On the *Chart of Accounts* (GL202500) form, the *12400 - Work in Progress* and *51500 - COGS - WIP Inventory Variance* GL accounts

Process Overview

On the *Production Order Types* (AM201100) form, you will create an order type for disassembly orders. Then on the *Production Preferences* (AM102000) form, you will specify this order type as the default type for orders used for disassembly operations.

System Preparation

Before you start creating the order type, do the following:

1. As a prerequisite to the current activity, complete *System Preparation for Manufacturing Implementation: Implementation Activity* so that the needed settings have been made in a company with the *U100* dataset preloaded.

2. Sign in to this company (in which the prerequisite activity has been performed) as a system administrator with the *gibbs* username and *123* password.

3. Make sure that the *Manufacturing* feature has been enabled on the *Enable/Disable Features* (CS100000) form.

Step 1: Creating the Disassembly Production Order Type

To create the production order type for disassembly, do the following:

1. Open the *Production Order Types* (AM201100) form.

2. On the form toolbar, click **Add New Record**.

3. In the Summary area, specify the following settings:

   a. **Order Type**: DA

   b. **Active**: Selected

   c. **Description**: Disassembly orders

   d. **Function**: *Disassemble*

4. On the **General Settings** tab, do the following:

   a. In the **Order Numbering Sequence** box of the **Numbering Settings** section, select *AMDIS*.

   b. In the **Account Settings** section, select the following accounts:

      ● **Work in Process Account**: *12400*

      ● **WIP Variance Account**: *51500*

   c. In the **Costing Method** box of the **Order Defaults** section, notice that *Actual* is selected and unavailable for editing because only the *Actual* costing method can be applied to disassembly operations.

   d. In the **Copy BOM Notes** section, select all the check boxes so that the system copies the notes to production orders of the type.

   e. In the **Data Entry Settings** section, specify the following settings:

      ● **Over Issue Material**: *Warn*

      ● **Include Unreleased Batch Qty.**: Selected

      ● **Issue Material Not on Order**: *Warn*

      ● **Move on Completed Operations**: *Warn*

      ● **Over Complete Orders**: *Warn*

      ● **Default Operation Move Qty.**: Selected

5. On the form toolbar, click **Save**.

Step 2: Specifying the Default Production Order Type for Disassembly

Because you have created an order type for disassembly production orders, you will specify this type as the default type for disassembly in the production settings. Do the following:

1. Open the *Production Preferences* (AM102000) form.

2. In the **Default Disassemble Order Type** box of the **General Settings** tab (**Data Entry Settings** section), select *DA*.

3. On the form toolbar, click **Save**.

You have successfully created the production order type for disassembly and specified it as the default order type for disassembly in the production settings.

Lesson 6: Configuring MRP

MRP Configuration: General Information

Acumatica ERP Manufacturing Edition provides you with the ability to use material requirements planning (MRP) to satisfy customer requirements while maintaining optimal inventory levels in a warehouse. This functionality is available only when the *Material Requirements Planning* feature is enabled on the *Enable/Disable Features* (CS100000) form.

In this topic, you will find information about configuring MRP in the system based on your business needs.

Learning Objectives

In this chapter, you will learn how to do the following:

- Create a master production schedule (MPS) type

- Specify system settings for the material requirements planning functionality

- Create MRP buckets

- Set up the stock items that are involved in MRP

- Set up the warehouses that are involved in MRP

Applicable Scenarios

You implement the material requirements planning functionality in the following cases:

- When you are initially implementing Acumatica ERP and the *Material Requirements Planning* feature is included in your license

- When you have purchased a license that includes the *Material Requirements Planning* feature, and you need to configure manufacturing in the existing Acumatica ERP system

Implementation of Material Requirements Planning

When you initially implement material requirements planning, you do the following:

- Create at least one MPS type on the *MPS Type* (AM203000) form. For details, see *MPS Types*.

- Specify MRP settings on the *MRP Preferences* (AM100000) form. For details, see *MRP Configuration: System Settings*.

- Create MRP buckets on the *MRP Buckets* (AM201200) form. For more information, see *MRP Buckets*.

- Specify MRP settings for a warehouse and warehouse locations on the *Warehouses* (IN204000) form. For details, see *Warehouse and Warehouse Locations in MRP*.

- Specify MRP and replenishment settings for stock items on the *Stock Items* (IN202500) or *Item Warehouse Details* (IN204500) form. For more information, see *Stock Items in MRP*.

- Optionally, create an automation schedule for MRP regeneration on the *Regenerate MRP* (AM505000) or *Automation Schedules* (SM205020) form. For details, see *Automation Schedule for MRP Regeneration*.

Data Used in MRP

The system considers the following during material requirements planning:

- Forecasts

- Sales orders, including open transfer orders

- Shipments that have not been released

- Inventory on hand

- MPS orders

- Production orders

- Purchase orders

During MRP, the system uses supply and demand entities. Supply entities are transactions or documents that register the receipt of inventory items in a warehouse—that is, purchase orders and production orders. Demand entities are transactions or documents that issue inventory items from a warehouse—that is, sales orders and forecast records.

You manage the set of entities included in planing at the warehouse level. For details, see *Warehouse and Warehouse Locations in MRP*.

MPS Types

You use the *MPS Type* (AM203000) form to create and manage MPS types. An MPS type provides default settings for master production schedule orders, such as the numbering sequence the system should use for the reference numbers of the orders and the setting that indicates whether MPS orders depend on the production orders. If you would like the item quantities in MPS orders to be reduced by the actual production orders that are scheduled to be completed prior to the MPS planning date, you select the **Dependent** check box.

MRP Buckets

Data used in MRP—that is, supply and demand entities—is aggregated for particular periods or *buckets*, which can be days, weeks, months, or years. You can define periods consisting of one interval or multiple intervals. The start date of a bucket is the ending date of the previous period. You use the *MRP Buckets* (AM201200) form to create and manage buckets. In the **Bucket** column, you define the bucket as follows:

- For a future period, you specify a positive integer value.

- For a present period that starts today, you specify `0`.

- For a past due period, you specify a negative integer value.

> (i) In addition to buckets for present and future periods, we recommend that you add at least one bucket for a past due period (that is, a bucket with the minus sign).

You then use the created buckets on the *MRP Requirements by Item* (AM401200) form to view the planning results.

Warehouse and Warehouse Locations in MRP

For each warehouse involved in manufacturing, on the *Warehouses* (IN204000) form, you need to select the entities that the system will consider during planning and the warehouse locations that store the items to be included in planning.

You manage the set of entities, transactions, and documents included in planing by selecting or clearing the corresponding check boxes in the **General** section of the **Manufacturing** tab on the *Warehouses* form. If all the check boxes are cleared, the warehouse is excluded completely from MRP.

> (i) If any of the following documents should be included in planning, you select the corresponding check boxes in the **General** section on the *MRP Preferences* (AM100000) form: sales orders on hold, purchase orders on hold, and production orders on hold.

For warehouse locations that should be included in planning, you select the check box in the **MRP** column of the table on the **Location Table** tab of the *Warehouses* form.

> ⚠ If the **MRP** check box is cleared for a warehouse location, then any production orders with this location as the planned receipt location are excluded from MRP.

Stock Items in MRP

For each stock item you want to include in material requirements planning, the MRP Item check box should be selected on the **Manufacturing** tab of the *Stock Items* (IN202500) form. In the MRP process, the system uses supply and demand data for the combination of the stock item and warehouse. However, if there is a demand for an item and warehouse and there is supply in another warehouse, an MRP exception of the *Transfer Available* type is generated on the *MRP Exceptions* (AM403000) form.

> ⚠ Stock items with a status of *Inactive* or *Marked for Deletion* are excluded from planning. Items with any of the following statuses are included in planning: *Active*, *No Sales*, *No Purchases*, and *No Request*.

For items involved in MRP, we recommend that you specify replenishment settings on the **Manufacturing** tab of the *Stock Items* (IN202500) form if the item is stored in one warehouse or the *Item Warehouse Details* (IN204500) form if the item is stored in multiple warehouses. In the **Replenishments** section, you should specify a value in the **Safety Stock** or **Reorder Point** box, depending on the value of the **Stocking Method** box on the *MRP Preferences* (AM100000) form.

The system also uses the following values specified for the default vendor from the **Vendor Details** tab on the *Stock Items* or *Item Warehouse Details* form:

- **Add Lead Time (Days)**: The number of days added to the default vendor lead time.

- **Min. Order Qty.**: The minimum order quantity for the planned orders.

- **Lot Size**: The item quantity of the lot; the system rounds up the quantity of the item in planned orders to the nearest multiple of the lot size. For example, suppose that the demand is 37, the minimum order quantity is 20, and the lot size is 5; then the planned order quantity is 40.

- **Max. Order Qty.**: The maximum order quantity for planned orders. Multiple planned orders can be created to cover the demand.

⚠️ If an item does not have a default vendor, then the system uses the settings specified on the **Manufacturing** tab of the *Stock Items* or *Item Warehouse Details* form during planning.

Automation Schedule for MRP Regeneration

We highly recommend that you set up an automation schedule to run MRP regeneration daily during the night or early morning so that the results are available for the planners and buyers at the start of their work day. You should set it to run after all other scheduled processes that impact supply and demand are run to ensure that the MRP process has the most up-to-date data. The following automated processes affect MRP:

- Any process that changes the on-hand quantity of inventory items, such as physical counts, adjustments, purchase receipts, shipments, and production reporting

- Any process that creates demand or supply orders or updates these orders to change quantities or dates, such as importing sales orders

- Inventory replenishment processes that calculate safety stock and reorder points

- Release of transactions or documents that were held during the day, such as invoices

You can create an automation schedule either on the *Regenerate MRP* (AM505000) form or on the *Automation Schedules* (SM205020) form.

MRP Configuration: System Settings

As a part of configuring material requirements planning in Acumatica ERP Manufacturing Edition, you need to specify the system settings on the *MRP Preferences* (AM100000) form, as described in this topic.

MRP Settings

On the *MRP Preferences* (AM100000) form, you specify the following:

- Settings for generating exception messages (optional): In the **Exceptions** section, you can specify the time periods (days before and days after) that determine when the system should not generate the *Defer* and *Expedite* exception messages. For details, see *Exception Message Management*.

- Forecast-related settings (optional): If you use forecasts, in the **Forecast** section, you can specify the demand time fence within which the forecast will be excluded from demand data and the numbering sequence for forecast identifiers. For more information about the demand time fence, see *Time Fences in MRP*.

- Master production schedule settings (optional): In the **MPS** section, you can specify the MPS time fence within which the MPS orders will be excluded from data used for planning and the default MPS type. For details about the MPS time fence, see *Time Fences in MRP*. For more information about MPS types, see *MPS Types*.

- Planning order type: In the **Plan Order Type** box (**General** section), you select the default planning order type (which should be created in advance) for the system to create planning orders during MRP.

- Grace period (optional): In the **Grace Period** box (**General** section), you can specify the time period within which the supply orders will be regarded as satisfying the demand date. For details, see *Grace Period in MRP*.

- Stocking method: In the **Stocking Method** box (**General** section), you select the method (either *Reorder Point* or *Safety Stock*) the system will use for replenishing the demanded items, which is initiated by MRP process.

- Settings for including documents on hold in planning: By using the **Include On Hold** check boxes in the **General** section, you determine if sales orders, purchase orders, and production orders on hold must be considered by the system during planning. For more information, see *Documents On Hold in MRP*.

- The setting determining the calculation of manufacturing times: You decide if you want the system to calculate lead times dynamically for a planned order or use the fixed lead time specified for an item by clearing or selecting, respectively, the **Use Fixed Manufacturing Times** check box (**General** section).

Exception Message Management

When the system performs material requirements planning, it uses the requested dates specified in demand orders and finds out if these dates can be satisfied according to the lead times of suppliers (for either your own manufacturing or that of your vendors). To help you decide if order dates (either the shipping date for the customer or the promise date for suppliers) should be adjusted, the system generates exception messages on the *MRP Exceptions* (AM403000) form for orders with items that can be delivered too early or too late.

To manage the generation of exception messages, you specify the values in the **Days Before** and **Days After** boxes of the **Exceptions** section on the *MRP Preferences* (AM100000) form. Both values must be less than or equal to the value in the **Grace Period** box in the **General** section. The greater the values, the fewer exception messages are generated. If the values are zero, then messages are generated whenever a supply date does not cover the demand.

The **Days Before** value represents the number of days that are acceptable for items to be supplied before the date requested by a customer. If the items in the order can be supplied earlier than the requested date minus the **Days Before** value, the system generates the *Defer* exception message on the *MRP Exceptions* form. If most of the lead times of your vendors are a week or less, then 7 days would be the appropriate value for the **Days Before** setting. When demand changes, you would want your vendor to defer a delivery to a later date. If the lead times of the vendors are larger, then you need to consider how often you want to ask your vendors to adjust their promise dates.

The **Days After** value represents the number of days that are acceptable for items to be supplied after the date requested by a customer. If the items in the order will be supplied later than the requested date plus the **Days After** value, the system will generate an *Expedite* exception message. This value is more critical than the **Days Before** value because a late delivery from a supplier impacts your ability to manufacture and ship to customers. A value of 2 to 5 days is recommended. MRP will not create a planned order to cover demand if the supply order is due within the grace period, but an *Expedite* exception message is generated to let the planner know that the supply order needs to be expedited so the inventory item is available when it is needed. If the order cannot be expedited, then the orders that require the inventory item need to be rescheduled to show that they will be late.

Time Fences in MRP

You can specify the demand time fence and the MPS time fence to control which data the system will use during planning.

The *demand time fence* is the time period from the MRP run date during which the forecast is no longer included in the total demand and the projected available inventory calculations. During this period, the system considers only customer orders when planning materials. Beyond this period, the greater value of dependent forecasts and actual demand drives MRP. You choose the value of the demand time fence based on how many days in advance customers place orders; the forecasts are used by invoices released and sales orders with ship dates within the starting and ending dates of each forecast. For example, if customers place orders at the beginning of every month and no more orders are expected, you may not want to consider the remaining forecast in MRP demand. You specify the value of the demand time fence in the **Demand Time Fence** box of the **Forecast** section on the *MRP Preferences* (AM100000) form.

Similarly, the *MPS time fence* is the time period from the MRP run date during which the system excludes MPS orders for which production orders have not been created from the data used for planning. You specify the value of the MPS time fence in the **Time Fence** box of the **MPS** section on the *MRP Preferences* form.

Grace Period in MRP

The grace period is the number of days after the requested date of an item in a demand order within which the item can be received in inventory (purchased from a vendor or produced internally) and still be considered as satisfying the requested date.

During planning, for each demand date (that is, the requested date of an item in a sales order), the system determines if a supply order (that is, a purchase or production order) within the grace period can fully satisfy the demand. You specify the grace period in the **Grace Period** box on the *MRP Preferences* (AM100000) form. If the demand is not fully satisfied by supply orders within the grace period, then the system creates a planned order to satisfy the remaining demand.

For example, suppose that you specify the grace period as 30 (which represents 30 calendar days). Further suppose that you have two sales orders, the first for 10 items with October 6 as the requested date and the second for another 10 items with October 10 as the requested date. Your vendor can deliver the materials required to produce the item on November 9. This supply will satisfy the sales order dated October 10 and will not satisfy the sales order dated October 6.

When a due date of a supply order is earlier than the demand date, the system does not consider the grace period and it satisfies all demands because there is no need to create a planned order.

You should consider your demand and supply patterns, supply lead times, and minimum order quantities to determine an appropriate value for the grace period.

Regardless of the grace period value, exception messages are always generated to expedite or defer supply orders based on the values of the **Days Before** and **Days After** boxes on the *MRP Preferences* form.

Documents On Hold in MRP

You can decide if sales orders, purchase orders, and production orders that are on hold should be considered by the system when planning materials. We generally recommend that you include the documents on hold in MRP. To do this, you select the **Include On Hold Sales Orders**, **Include On Hold Purchase Orders**, and **Include On Hold Production Orders** check boxes in the **General** section of the *MRP Preferences* (AM100000) form.

You should not include the on-hold orders in MRP if any of the following conditions is true in your company:

- Sales orders are always prepaid and they are on hold until they are paid; when the orders are paid, the dates are set appropriately. Another case is when customers frequently cancel orders or change the dates and new dates should be specified in the order. In these cases, the **Include On Hold Sales Orders** check box should be cleared.

- Production orders are placed on hold when the sales orders are in the process of being canceled or changed (these orders could include configured items). In this case, the **Include On Hold Production Orders** check box should be cleared.

- The purchasing department creates orders far in advance with suppliers and often needs to await confirmation of delivery dates and quantities from the supplier. In this case, the **Include On Hold Purchase Orders** check box should be cleared.

MRP Configuration: Prerequisites

Before starting to configure the material requirements planning (MRP) functionality, you must be sure that the system has been configured properly and that all required entities have been created, as described in the following sections.

Enabling the Needed Features

On the *Enable/Disable Features* (CS100000) form, the *Material Requirements Planning* feature must be enabled.

Configuring the System

You need to make sure the following tasks have been performed in Acumatica ERP before you begin to implement MRP:

- On the *Numbering Sequences* (CS201010) form, a numbering sequence for forecast identifiers has been created.

- On the *Numbering Sequences* form, a numbering sequence for the identifiers of master production schedule (MPS) orders has been created.

- On the *Production Order Types* (AM201100) form, at least one production order type with the *Planning* function has been created.

- On the *Work Calendar* (CS209000) form, a calendar that MRP will use to calculate action and promise dates from vendor lead times has been created.

MRP Configuration: Implementation Activity

In the following implementation activity, you will learn how to specify the system settings related to material requirements planning (MRP).

Story

Suppose that you are an implementation manager who needs to prepare the system for material requirements planning.

According to the business processes of SweetLife Fruits & Jams, exception messages must be generated for supply orders dated 7 days before the requested date of a demand order and supply

orders dated 5 days after this date. The demand time fence and MPS time fence should be 30 days, the same as the grace period for supply orders. You will use the *Reorder Point* stocking method for replenishing materials. Sales orders, production orders, and purchase orders on hold must be considered by the system during planning. Also, the system should generate lead times dynamically for planned orders.

You need to create periods (or buckets) for MRP to aggregate demand and supply data. You will have 13 weekly periods, 1 monthly period, and 1 yearly past due period.

You need to make sure that the warehouse involved in manufacturing has been configured properly for MRP.

Also, for stock items that are used as materials, you need to specify replenishment settings, such as the safety stock quantity, the reorder point, the minimum order quantity, and the maximum order quantity.

Configuration Overview

The following entities, which you will use in this activity, have been predefined in the *U100* dataset:

- On the *Numbering Sequences* (CS201010) form, the *AMMPS* and *AMFCST* numbering sequences

- On the *Work Calendar* (CS209000) form, the *MAIN* calendar

- On the *Warehouses* (IN204000) form, the *WORKHOUSE* warehouse

- On the *Stock Items* (IN202500) form, the *JUICECUP1L* stock item

Process Overview

In this activity, to specify settings related to MRP, you will do the following:

1. On the *MPS Type* (AM203000) form, create an MPS type to be used in the MRP settings.

2. On the *MRP Preferences* (AM100000) form, specify the system settings that affect the MRP process.

3. On the *MRP Buckets* (AM201200) form, create the needed buckets for MRP.

4. On the *Warehouses* (IN204000) form, review the settings of the *WORKHOUSE* warehouse related to MRP.

5. On the *Stock Items* (IN202500) form, specify the settings of the *JUICECUP1L* stock item that will be used by the system during MRP.

System Preparation

Before you start specifying MRP settings, do the following:

1. As a prerequisite to the current activity, complete *System Preparation for Manufacturing Implementation: Implementation Activity*, so that the needed settings have been specified in a company with the *U100* dataset preloaded.

2. As a prerequisite to the current activity, complete *Production Order Types: To Create a Planning Production Order Type* so that the planning order has been created in a company with the *U100* dataset preloaded.

3. Sign in to the company in which the prerequisite activities have been performed as a system administrator by using the *gibbs* username and *123* password.

4. Make sure that the *Material Requirements Planning* feature has been enabled on the *Enable/Disable Features* (CS100000) form.

Step 1: Creating an MPS Type

To create an MPS type, do the following:

1. Open the *MPS Type* (AM203000) form.

2. On the form toolbar, click **Add Row**.

3. In the new row, specify the following settings:

   - **Type ID**: `MPS`

   - **Description**: `Master production schedule`

   - **Numbering Sequence**: *AMMPS*

   - **Dependent**: Selected

4. On the form toolbar, click **Save**.

Step 2: Specifying General MRP Settings

To specify the system settings that affect MRP, do the following:

1. Open the *MRP Preferences* (AM100000) form.

2. In the **Exceptions** section, specify the following settings:

   - **Days Before**: `7`

   - **Days After**: `5`

3. In the **Forecast** section, specify the following settings:

   - **Demand Time Fence**: `30`

   - **Numbering Sequence**: *AMFCST*

4. In the **MPS** section, specify the following settings:

   - **Time Fence**: `30`

   - **Default Type**: `MPS`

5. In the **General** section, specify the following settings:

   - **Plan Order Type**: `PL`

   - **Grace Period**: `30`

   - **Stocking Method**: *Reorder Point*

   - **Purchase Calendar ID**: *MAIN*

   - **Include On Hold Sales Orders**: Selected

- **Include On Hold Purchase Orders**: Selected

- **Include On Hold Production Orders**: Selected

- **Use Fixed Manufacturing Lead Time**: Cleared

6. On the form toolbar, click **Save**.

Step 3: Creating the MRP Buckets

To create the needed MRP buckets, do the following:

1. Open the *MRP Buckets* (AM201200) form.

2. On the form toolbar, click **Add New Record**.

3. In the Summary area, specify the following settings:

- **Bucket ID**: `MAIN`

- **Description**: `Main bucket`

- **Active**: Selected

4. In the Buckets table, add a bucket for a yearly past due period as follows:

   a. On the table toolbar, click **Add Row**.

   b. In the new row, specify the following settings:

   - **Bucket**: `-1`

   - **Value**: `1`

   - **Interval**: *Year*

5. Add 13 buckets for weeks as follows:

   a. On the table toolbar, click **Add Row**.

   b. In the new row, specify the following settings:

   - **Bucket**: `1`

   - **Value**: `1`

   - **Interval**: *Week*

   c. Add the other 12 rows, and in the **Bucket** column, type 2 in the next row, type 3 in the row after that, and continue this pattern through 13 in the last row. You enter `1` in the **Value** and **Interval** columns for each of these rows.

6. Add a bucket for a month as follows:

   a. On the table toolbar, click **Add Row**.

   b. In the new row, specify the following settings:

   - **Bucket**: `14`

- **Value**: 1

- **Interval**: *Month*

7. On the form toolbar, click **Save**.

Step 4: Reviewing the MRP Settings for a Warehouse

You will review the MRP-related settings that have been predefined for the *WORKHOUSE* warehouse in the *U100* dataset. Do the following:

1. Open the *Warehouses* (IN204000) form.

2. In the **Warehouse ID** box of the Summary area, select *WORKHOUSE*.

3. In the **General** section of the **Manufacturing** tab, make sure that all check boxes are selected. This means that all documents and entities will be considered by the system during the MRP process.

4. On the **Location Table** tab, make sure that the check boxes in the **MRP** column are selected for all rows in the table. This means that all the locations are involved in the MRP process.

Step 5: Specifying MRP Setting for Stock Items

You will specify the MRP-related settings for the *JUICECUP1L* stock item, which has been predefined in the *U100* dataset. In a production environment, you would need to specify similar settings for all stock items that will be used for MRP. Do the following:

1. Open the *Stock Items* (IN202500) form.

2. In the **Inventory ID** box of the Summary area, select *JUICECUP1L*.

3. On the **Replenishment Info** tab, specify the following settings in the only row:

- **Safety Stock**: 3

- **Reorder Point**: 5

4. On the **Vendor Details** tab, do the following in the row for the *JALOOZA* vendor:

    a. Make sure that in the **Lead Time (Days)** column, the *7* value has been specified.

    b. In the **Min. Order Quantity** column, specify 2.

    c. In the **Max. Order Quantity** column, specify 10.

5.

6. On the **Manufacturing** tab, make sure that the **MRP Item** check box is selected in the **General** section.

7. On the form toolbar, click **Save**.

You have gained experience with specifying the system settings that are related to material requirements planning.

Additional Materials

Appendix A: Work Centers

Work Centers: Substitution of Work Centers

A company may have multiple production facilities where an item can be made. The components used to make the item may be the same, although they may have different costs; the production process also may be the same, but the production facilities may have different labor and overhead rates. For these cases, the ability to specify substitute work centers has been implemented in Acumatica ERP Manufacturing Edition, as described in this topic. The system can substitute work centers during production order creation based on the warehouse used for production. This substitution can eliminate the need to have warehouse-specific bills of material.

The ability to specify substitute work centers is available only if the *Multiple Warehouse* feature is enabled on the *Enable/Disable Features* (CS100000) form.

Substitution of Work Centers

You do the following to configure the ability to substitute work centers:

1. On the *Production Order Types* (AM201100) form, you select the **Substitute Work Centers** check box on the **General Settings** tab for the needed production order type.

2. On the *Work Centers* (AM207000) form, you add substitutes for each applicable work center to the **Substitute Work Centers** tab.

When a user creates a production order of a type for which the **Substitute Work Centers** check box is selected or changes a warehouse for the order, the system compares the warehouse of the production order and the warehouse of each work center specified in the order. If the warehouse of a work center differs from the warehouse of the order, the system looks for substitute work centers with the warehouse that matches the order warehouse. If such a work center is found, the system replaces the work center with the substitute, changing the operation description, replacing the backflush labor setting, and copying the overhead rates of the substitute work center.

Work Centers: Related Forms

In the following sections, you can find details about the forms you may want to review to gather information about work centers.

> ⚠ If you do not see a particular report or form that is described, you may have signed in to the system with a user account that does not have access rights to the report or form. Contact your system administrator to obtain access to any needed reports or forms.

Viewing the Capacity of a Work Center

You can use the *Work Center Capacity* (AM405000) form to view the capacity of work centers for which production orders are scheduled.

Viewing Open Operations for a Work Center

On the *Work Center Dispatch* (AM000007) form, you can view the list of production orders that require operations assigned to work centers.

Viewing Production Schedules for Each Work Center

You can view the production schedule for each work center by date and time on the *Work Center Schedule* (AM000001) form. The schedule includes planned orders generated by forms of the material requirements planning functional area.

Appendix B: Bills of Material

Bills of Material: Implementation Checklist

The following section provides details you can use to ensure that the bill of material and the related entities are configured properly for processing production transactions.

Implementation Checklist

We recommend that before you initially process manufacturing transactions, you make sure the needed features have been enabled, settings have been specified, and entities have been created, as summarized in the following checklist.

Form	Criteria to Check
BOM Preferences (AM101000)	The following basic settings have been specified on the **General Settings** tab: • The numbering sequence for bills of material in the **BOM Numbering Sequence** box (**Numbering Settings** section) • The default revision identifier in the **Default Revision** box (**Data Entry Settings** section) • Whether the duplicated materials can be added at the operation and bill of material levels by selecting the appropriate values in the **Duplicates on Operation** and **Duplicates on BOM** boxes (**Data Entry Settings** section) • The default work center in the **Default Work Center** box (**Data Entry Settings** section)
Labor Codes (AM206500)	At least one labor code of the *Direct* type has been created.
Machines (AM204500)	The machines that are involved in production have been created.

Form	Criteria to Check
Tools (AM205500)	The tools that are used in production and whose costs must be included in the cost of the finished goods have been created.
Overhead (AM202500)	The overhead entities have been created to represent the extra costs that must be included in the cost of the finished goods, and in each overhead entity, the unit cost associated with this overhead entity.
Stock Items (IN202500)	For the stock items used as materials, costs have been specified on the **Price/Cost Info** tab. If these items are to be produced, if the item is produced in lots, the lot size has been specified in the **Lot Size** box on the **Manufacturing** tab.
Non-Stock Items (IN202000)	For the non-stock items used as materials, costs have been specified on the **Price/Cost Information** tab.
Work Calendar (CS209000)	The work calendars that define the available hours for the manufacturing floor have been created.
Shifts (AM205000)	At least one shift has been created. If the shift describes overtime or holiday work, the differential compared to the base pay must be specified.
Work Centers (AM207000)	At least one work center has been created; a work center represents the physical or virtual location in a warehouse or production facility.
Bill of Material (AM208000)	Bills of material have been created for all stock items to be produced.

Bills of Material: Related Reports

In the following sections, you can find details about the reports you may want to review to gather information about bills of material.

> ⚠️ If you do not see a particular report or form that is described, you may have signed in to the system with a user account that does not have access rights to the report or form. Contact your system administrator to obtain access to any needed reports or forms.

Viewing a Level-by-Level List of Materials

For multilevel bills of material (those that include other bills of material), you can view the full list of materials grouped by levels by using the *Multi Level BOM* (AM413000) report.

Viewing BOM Operation Details

You can view the operations included in bills of material with details of the required materials, steps, tools, and overhead for each operation by using the *BOM Routing* (AM612000) form.

Viewing Materials and Their Costs of a BOM

You can view the list of materials required to produce a stock item and specified in a BOM and the costs of the materials by using the *BOM Summary* (AM611000) report.