

Reading Sample

This chapter excerpt explains how to prepare for variance analysis by creating cost estimates. You'll learn about the logistics master data setup and follow step-by-step instructions to configure overhead costs, cost components, and costing variants.

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John Jordan, Janet Salmon

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Chapter 2

Cost Estimates

Now that we've planned activity prices and updated purchasing info records for component prices with the latest vendor quotations, the next step in preparing for variance analysis is the creation and processing of cost estimates. We'll discuss the relevant master data and discuss key topics such as standard, preliminary, and mixed cost estimates in this chapter.

Cost estimates provide a plan of how much it will cost to procure components and produce assemblies and finished goods. Standard cost estimates are typically created several weeks before the start of the next fiscal year. System messages are analyzed, and corrective actions are taken. For instance, there may be missing purchasing info records or activity prices that need to be entered.

After you make corrections and eliminate error messages, you typically analyze inventory revaluation when you release the cost estimates in the costing run. After analyzing individual materials with the largest revaluations and making adjustments where necessary, you typically carry out a plausibility check on whether the costing results are realistic by determining the percentage total change in inventory value compared to last year. You may then get sign-off from a manager authorizing release of the costing run.

You typically release standard cost estimates on the first day of the fiscal year. Releasing standard cost estimates updates inventory valuation, and new material standard prices become the benchmark for all production and purchasing activities over the next 12 months. Some companies with rapidly changing and developing products create and release standard cost estimates more frequently to keep pace with the changes. Otherwise, variances would become so large toward the end of the fiscal year that they would provide no assistance during variance analysis. We'll discuss this further in Section 2.5.

Material Ledger

The best option to deal with rapidly changing product and commodity prices is to implement Material Ledger actual costing. The Material Ledger tracks all goods movements and price and exchange rate differences within a period for materials valued at standard. Then, at the end of the period or sometime during the subsequent period,



the actual costing run calculates an actual cost, or periodic unit price (PUP), by taking the value of the cumulative inventory at standard cost, adding the price and exchange rate differences, and dividing by the cumulative inventory. We'll look at actual costing with the Material Ledger further in Chapter 4, Section 4.7.

In this chapter, we'll next look at logistics master data, for example, bills of material (BOMs), routings, and product cost collectors. These structures provide quantity information, which, together with the plan price information from Chapter 1, allows the creation of cost estimates to determine the plan price of assemblies.

We'll also look at how overhead is allocated to products and see how the costing variant instructs the system as to which prices, BOMs, and routings to use. We'll create standard and preliminary cost estimates and see how they assemble and present price information. Finally, we'll examine the configuration and master data settings required to create mixed cost estimates.

2.1 Master Data

Master data is information that stays relatively constant over long periods of time, such as purchasing info records, which contain vendor information (e.g., business name) that doesn't change often. In comparison to master data, transactional data is posted often, resulting in frequent updates to general ledger accounts and cost centers.

Even though master data is relatively stable, companies that want to remain competitive in rapidly changing environments constantly assess whether it's more cost effective to manufacture assemblies in-house, procure externally, or outsource. Changing methods of procurement can heavily affect variance calculations and require constant master data and purchasing information maintenance.

Logistics master data provides information on how materials are procured and manufactured. This section gives an overview of the master data fields relevant to variance analysis.

2.1.1 Material Master

Material masters contain all the information required for you to manage a material. Information is stored in views, each corresponding to a department or area of responsibility. Views conveniently group information together for users in different departments, for example, sales and purchasing. Views of interest during variance analysis include views for material requirements planning (MRP), costing, and accounting. These views are plant-specific, so plants can have different values for their fields.

Material Master Number

A material master number uniquely identifies a material within a plant. Material master numbers can be extended from 18 to 40 characters in length with Transaction OMSL. Refer to SAP Note 2232396 for more information.

Extended material master numbers are useful for certain industries, such as automotive, which often require the material number to include the vehicle identification number (VIN), which is 17 characters in length.

Let's examine the material master starting with the **MRP 1** view.

MRP 1 View

You can view or change material master views with Transaction MM02 or menu path **Logistics • Production • Master Data • Material Master • Material • Change • Immediately**. Click the **MRP 1** tab to display the screen shown in Figure 2.1.

The screenshot shows the SAP Material Master MRP 1 View for material P-100. The title bar reads "Change Material P-100 (Finished Product)". The navigation bar includes tabs for Sales text, MRP 1 (selected), MRP 2, MRP 3, MRP 4, Advanced Planning, Extended SPP, and Forecasting. The main content area is divided into several sections:

- Material Data:** Material: P-100, *Descr.: Finished Product, Plant: 1710 (Production Plant).
- General Data:** *Base Unit of Measure: BT (Bottle), MRP Group: [], Purchasing Group: [], ABC Indicator: [], Plant-Sp.Matl. Status: [], Valid From: [].
- MRP procedure:** *MRP Type: PD (Forecast Consumption, No Planning Time Fence), Reorder Point: [], Planning time fence: [], Planning Cycle: [], MRP Controller: 001.
- Lot size data:** Lot Sizing Procedure: EX (Lot-for-lot order quantity), Minimum Lot Size: [], Maximum Lot Size: [], Fixed lot size: [], Maximum Stock Level: [], LS-Independent Costs: [], Storage Costs Code: [], Assembly scrap (%): 10.00, Takt time: [], Rounding Profile: [], Rounding value: [].

Figure 2.1 Material Master: MRP 1 View

The fields that are most relevant to costing are located in the **General Data** and **Lot size data** sections. Let's examine each section in turn.

In the **General Data** section, **Base Unit of Measure** allows you to manage stocks of a material in a base unit of measure (UoM). All quantities you enter in other UoMs (alternative UoMs) are converted to the base UoM. You can use alternative UoMs, for example, for purchasing and sales.

An entry in the **Plant-Sp.Matl Status** (plant-specific material status) field determines if you cost the material. Plant-specific material status can also be used for purposes other than costing, such as to issue a warning or error message when a purchase or production order is created for discontinued materials.

You can view the list of possible settings behind plant-specific material status with Transaction OMS4 or by following the IMG menu path **Controlling • Product Cost Controlling • Product Cost Planning • Material Cost Estimate with Quantity Structure • Settings for Quantity Structure Control • Material Data • Check Material Status**.



Discontinued and Obsolete Materials

Discontinued materials will be replaced by another material after the remaining inventory is consumed. You can allow a discontinued material to be costed, but you may want to issue a warning or error message when creating a purchase order. The **Discontinued parts** section in the **MRP 4** view allows you to enter the material number that the system can use in materials planning to replace the discontinued material after its warehouse stock is depleted.

Obsolete materials aren't intended for further use. This can arise, for example, if the material is out of date or has a design problem. Typically, in this situation, you may decide to scrap or sell the remaining inventory. In the case of an obsolete material, you can set the plant-specific material status to display either a warning or an error message during costing if the material is contained in the BOM of an active assembly.

You can also use the plant-specific material status to restrict the use of new parts during different stages of developing or phasing out a product.

MRP needs to determine proposed quantities and dates for manufacturing and purchase orders so you can meet the needs of independent requirements such as customer sales orders. MRP uses information from the **Lot size data** fields of the **MRP 1** view to calculate the quantity and date of proposed orders.

In addition, in the **Lot size data** section, the **Assembly scrap (%)** field indicates the percentage scrap that occurs during production when the material is an assembly. MRP increases the quantity to be produced by the scrap quantity calculated. For example, if a quantity of 100 is required, and 10% assembly scrap is entered, 110 are produced with the expectation that 10 will be scrapped.

MRP 2 View

Now let's look at the **MRP 2** view. Click on the **MRP 2** tab to display the screen shown in Figure 2.2.

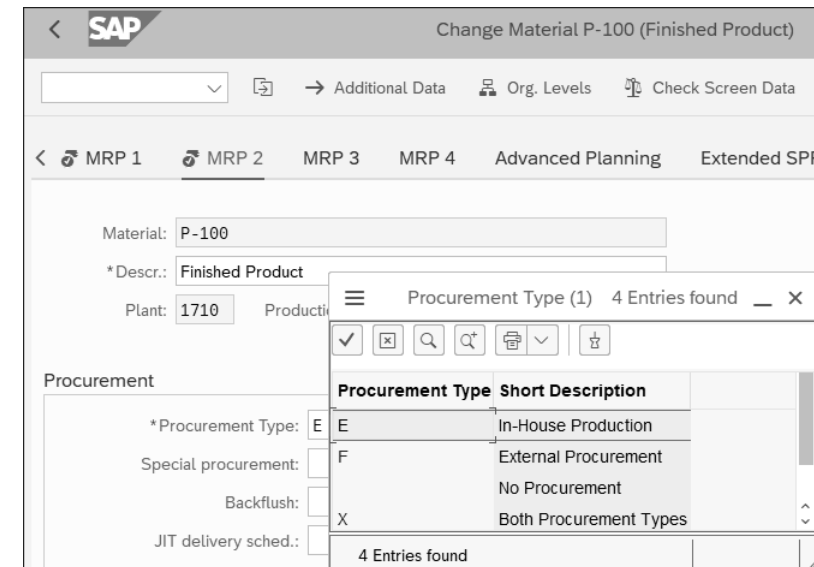


Figure 2.2 Material Master: MRP 2 View

You can display a list of possible entries for the **Procurement Type** field as follows:

1. Left click in the **Procurement Type** field.
2. Right-click and choose **Possible Entries** (or press the **F4** key).

A list of possible procurement types is displayed, as shown in Figure 2.2. The procurement type defines how the material is procured, which is usually either manufactured **In-House Production (E)** or **External Procurement (F)**. Let's take a closer look at each option:

■ In-House Production

This setting means the system will search for a production version that is a unique combination of BOM and routing alternatives. A production version is mandatory for in-house production.

■ External Procurement

This setting results in the system searching for a purchasing info record. If there is no quota arrangement and no source list, MRP can assign a purchasing info record that is marked as relevant for sourcing. You set this indicator in the info record purchasing organization data screen with Transaction ME12 or via menu path **Logistics • Materials Management • Purchasing • Master Data • Info Record • Change**.

If the indicator is set for more than one info record, the system assigns the oldest. See SAP Note 2268069 for more information on simplified sourcing.

■ Both Procurement Types (X)

This setting means that planned orders can be converted into either production or purchase orders.

The **Special procurement** field found immediately below the **Procurement Type** field in Figure 2.2 is used to define the procurement type more closely. For example, it may indicate if the item is produced in another plant and transferred to the plant you're looking at. You can also override the procurement type with the special procurement type. For example, if the procurement type is in-house, you can ignore the BOM and routing to process the material as externally procured by specifying the special procurement as external. When a material has a routing but no BOM, it's treated as an externally procured material even if the procurement type is in-house. Both the BOM and the routing are ignored. If you specify the special procurement type as in-house, the routing is included even if the material has no BOM. Special procurement gives you more detailed control over the procurement type setting. Here is an example list of possible special procurement types (see the glossary in Appendix A for detailed definitions of these terms):

- 10: Consignment
- 20: External procurement
- 30: Subcontracting
- 45: Stock transfer from plant to MRP area
- 50: Phantom assembly

You can define your own special procurement types with Transaction OMD9 or via the IMG menu path.

MRP 3 View

Now let's look at the **MRP 3** view. Click on the **MRP 3** tab to display the screen shown in Figure 2.3.

In the **Planning** section, the **Strategy Group** field includes the following strategies:

- **Make-to-stock production (10)**
You manufacture to maintain a certain quantity in collective stock.
- **Make-to-order production (20)**
You manufacture based on individual sales orders for customer stock.

The screenshot displays the SAP Material Master MRP 3 View for material SG-CFP. The interface includes a navigation bar with tabs for MRP 2, MRP 3 (selected), MRP 4, Advanced Planning, Extended SPP, Work scheduling, and Plant data / stor. 1. The main content area is divided into several sections:

- Material:** SG-CFP, *Descr.: Centrifugal Pump, Plant: 1710 (Production Plant).
- Forecast Requirements:** Period Indicator: M, Fiscal Year Variant: [], Splitting indicator: [].
- Planning:** Strategy Group: 10 (Make-to-stock production), Consumption mode: [], Fwd consumption per.: [], Planning material: [], Plng conv. factor: [], Bwd consumption per.: [], Mixed MRP: [], Planning plant: [], Planning matl BUnit: [].
- Availability check:** Availability check: SR, Tot. repl. lead time: [] days, Cross-project: [].
- Plant-specific configuration:** ConfigurableMaterial: [], Variant: [], Planning variant: [], with buttons for 'Configure variant' and 'Configure planning variant'.

Figure 2.3 Material Master: MRP 3 View

MRP 4 View

Now let's look at the **MRP 4** view. Click on the **MRP 4** tab to display the screen shown in Figure 2.4.

In the **BOM explosion/dependent requirements** section, the **Component Scrap (%)** field indicates the percentage of scrap during production of the material as a component. For example, if the required component quantity is 100, and 10% component scrap is entered, 110 are issued with the expectation that 10 will be scrapped.

You can also maintain the component scrap in the BOM item, which takes priority over an entry in the **MRP 4** view. We discuss BOM item maintenance in Section 2.1.2.

Figure 2.4 Material Master: MRP 4 View

Costing 1 View

Now let's look at the costing views, starting with the **Costing 1** view. Scroll to the **Costing 1** tab, and select it to display the screen shown in Figure 2.5.

The **Origin Group** under **General Data** enables you to separately identify materials assigned to the same cost element so you can assign them to separate cost components. A cost component identifies costs of similar types, such as material, labor, and overhead, by grouping together cost elements.

A field relevant to variance analysis is the **Variance Key** field. Variances are only calculated on manufacturing orders or product cost collectors containing a variance key. This key is defaulted from the **Costing 1** view when production orders or product cost collectors are created. The variance key also determines if scrap value is subtracted from actual costs before variances are determined.

Another field relevant to variance analysis is **Costing Lot Size** under **Quantity structure data**. When you create multiple cost estimates in a costing run with Transaction CK40N (Section 2.6), the costing lot size in the **Costing 1** view is used by each cost estimate by default. When you create an individual cost estimate with Transaction CK11N, you can manually set the costing lot size in the initial selection screen. We'll discuss cost estimates in more detail in Section 2.5.

You should set the **Costing Lot Size** as close as possible to the actual procurement lot size. Unfavorable variances may result if a manufacturing order is created for a quantity

less than the costing lot size. Setup time is the time needed to prepare equipment and machinery to produce assemblies, and it's generally the same regardless of the quantity produced. Setup and teardown time spread over a smaller production quantity increases the unit cost. This also applies to externally procured items because vendors usually quote higher prices for smaller quantities.

Figure 2.5 Material Master: Costing 1 View

Equipment Cleaning

Setup and teardown time can also represent equipment cleaning time, for example, in food and pharmaceutical industries in between production campaigns, which can be significant to meet cleanliness and regulatory requirements.

A trend of costing lot size variance may lead you to investigate why your manufacturing or purchasing order quantities are less than planned in the costing lot size. Lower customer order quantities may require you to consolidate your manufacturing or purchase orders.

Costing 2 View

Now let's inspect the **Costing 2** fields. Click on the **Costing 2** tab to get to the screen shown in Figure 2.6.

Figure 2.6 Material Master: Costing 2 View

The **Cost Estimate** fields in the **Standard Cost Estimate** section are updated when a standard cost estimate is marked and released. The **Future Planned Price** field is populated when a cost estimate is marked. The **Current Planned Price** and **Standard price** fields are overwritten when subsequently releasing a cost estimate. The **Previous Planned Price** field contains the value of the previously released standard cost estimate. Cost estimate fields in the material master can't be manually changed.

You can manually update the **Planned price 1, 2, and 3** fields with estimated purchase prices in the **Planned prices** section of the screen shown in Figure 2.6. A standard cost estimate can retrieve planned prices from these fields if no vendor quotations or purchasing info records exist for purchased items as configured in the valuation variant discussed in Section 2.4.2. This is useful when creating cost estimates before vendor quotations are received, early in the lifecycle of a new or modified product. During product development, you also have the option of using a different costing variant that

doesn't allow costs to be released to become the standard cost until the development process is complete.

The **Valuation Class** field in the **Valuation Data** section determines which general ledger accounts are updated during inventory movements or settlement. The **Price control** field indicates whether inventory is valued at standard (**S**) or moving average (**V**) price.

Accounting 1 View

Next, let's examine the accounting views. Navigate to the **Accounting 1** tab to display the screen shown in Figure 2.7.

Figure 2.7 Material Master: Accounting 1 View

The **Accounting 1** view displays fields that are relevant for the Material Ledger, which is mandatory in SAP S/4HANA. If the **ML Act.** checkbox is selected under **General Valuation Data**, this indicates the Material Ledger is active for this material in this plant, and because the Material Ledger is mandatory, this field is always selected and isn't editable.

Price determination (**Price Determ.**) is only relevant if the Material Ledger is active. If it's set to **3: Single-/Multilevel**, and **Price Control S** is set under **Prices and Values**, then actual costing is active. Enabling actual costing is an optional setting.

With actual costing active, the Material Ledger tracks all goods movements and price and exchange rate differences within a period for materials valued at standard. Then, at the end of the period (or during the subsequent period), the actual costing run calculates an actual cost PUP by taking the value of the cumulative inventory at standard cost, adding the price (or exchange rate) differences, and dividing by the cumulative inventory.

Actual costing allocates all purchasing and manufacturing variances upward through the BOM to assemblies and finished goods. Actual costing determines what portion of the variance is debited to the next highest level using material consumption. Variances can be rolled up over multiple production levels to the finished product.

Accounting 2 View

Next, let's look at the **Accounting 2** view. Scroll to the **Accounting 2** tab to display the screen shown in Figure 2.8.

Figure 2.8 Material Master: Accounting 2 View

The **Accounting 2** view displays **Tax price/Commercial price** fields to determine inventory value based on tax and commercial valuations in the oil and chemical industries typically. You can also set the material as **LIFO/FIFO-relevant**. Last in, first out (LIFO) means that material acquired most recently is used or consumed first. When new stock is acquired or consumed, there is no change in the value of older stocks. As a result, price inflation can't lead to an overvaluation of older stocks.

Manage Material Valuations

Alternatively, you can use the Manage Material Valuations app from SAP Fiori to view all accounting- and costing-related information about a material. The app displays an overview of valuation data for materials, including sales order stocks. A price history is available, and you can see standard cost estimates, change inventory prices, or release planned prices. You can find more information at <http://s-prs.co/v562900>.

2.1.2 Bill of Material

After material masters are created and fields are populated correctly, you can use them to create a BOM, as discussed in this section.

The BOM is a structured hierarchy of components to build an assembly. BOMs, together with purchasing info records or vendor quotations, provide cost estimates with the information necessary to calculate the material costs of products. You can view or change BOMs with Transaction CS02 or via menu path **Logistics • Production • Master Data • Bills of Material • Bill of Material • Material BOM • Change**.

BOMs are time-dependent and have validity dates. When you select a BOM with Transaction CS02, you must nominate a key date in addition to the material, plant, and BOM usage. The BOM usage defines the area, such as design or production, where a BOM can be used. An example of a BOM is shown in Figure 2.9. A cost estimate created for the top-level finished good selects materials at the lowest level in the BOM first.

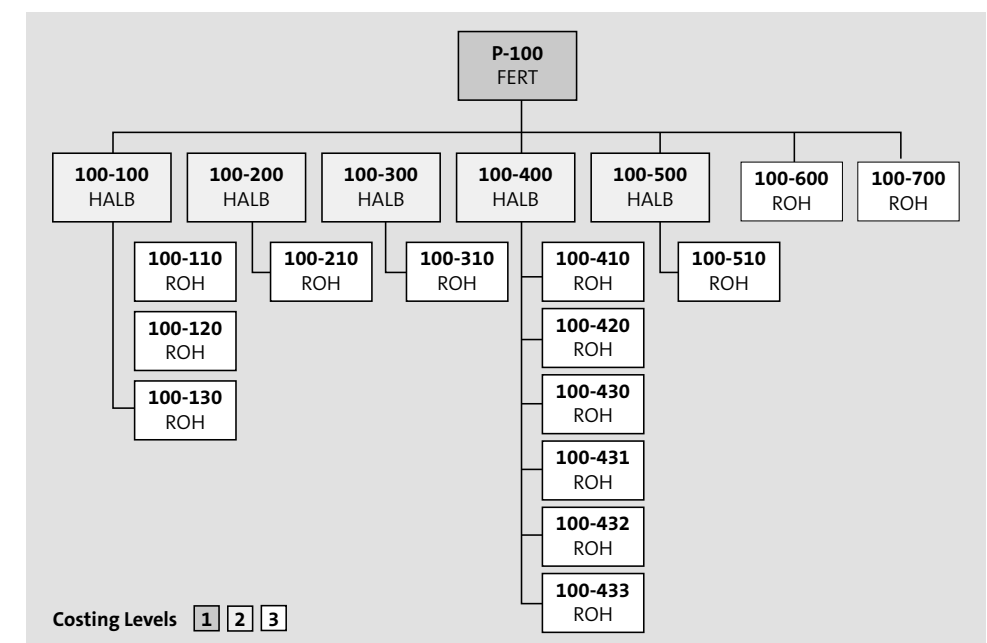


Figure 2.9 Example of a BOM

In Figure 2.9, all materials with material type ROH (raw materials) are costed first, then HALB (subassemblies), and finally FERT (finished goods). Material costs are rolled up from raw materials (costing level 3) through subassemblies (costing level 2) to the finished good (costing level 1).

The BOM determines which materials you cost. Each BOM item contains many fields and indicators, as shown in Figure 2.10.

The screenshot shows the SAP 'Change material BOM: Item: All data' interface. The 'Basic Data' tab is active. The form contains the following fields and values:

- Material: F-10A
- Plant: 1710
- Alternative BOM: 1
- Item Number: 00010
- * Component: S-201
- Item category: L
- Item ID: 00000001
- * Quantity: 100
- Component Scrap (%): 10.00

Figure 2.10 BOM Item: Basic Data Tab

The fields relevant to variance analysis include the following in the **Basic Data** tab:

- **Quantity**
The BOM item quantity multiplied by the material standard price provides plan material costs.
- **Operation scrap in %**
We discuss operation scrap in detail in Chapter 5, Section 5.4.

- **Component Scrap (%)**
Component scrap is the percentage of scrap that occurs during production if the material is a component. The system increases the required quantities of the components by the calculated scrap quantity. Component scrap in the BOM item takes priority over an entry in the **MRP 4** view, as discussed in Section 2.1.1.
- **Net ID**
You select the **Net ID** checkbox to ignore assembly scrap. Without the checkbox selected, assembly scrap in the upper-level assembly increases the quantities of all lower-level components and is additive to component scrap.

Another important field is the **Costing Relevancy** indicator in the **Status/Long Text** tab. Deselecting the **Costing Relevancy** indicator allows you to exclude the cost of some BOM items, for example, bulk materials that are expensed directly to a cost center, so the cost is already included in the cost estimate via overhead or activity rates. Usually, a material is either 100% relevant or not relevant, but you can also configure a relevancy flag for balance sheet valuation where, for example, packaging is only 80% relevant.

You can use transfer control if you don't want to create a new standard cost for an assembly or component. Transfer control instructs the cost estimate to use an existing cost estimate. You can include transfer control as a component of the costing variant as we'll discuss in Section 2.4.4.

Example: Transfer Control

After an annual costing run is released, a new finished good is created that requires a standard cost estimate; however, you don't want the lower-level components to be re-costed. You may require this setting, for example, where the components and subassemblies are also included in the BOMs of other assemblies.

In this situation, you create a standard cost estimate with a costing variant and valuation variant with transfer control, which transfers all lower-level existing cost estimates to the new finished good standard cost estimate.

2.1.3 Work Center

Material masters and BOMs provide cost estimates with material and assembly prices and quantities. To determine labor and activity standard quantities, we need to consider work centers, which we'll discuss in this section, and routings, which we'll discuss in the next section. You perform operations at work centers that represent, for example, machines, production lines, or employees, as shown in Table 2.1.

[Ex]

Definition	
A work center is a physical location at which an operation is carried out.	
Examples	
Individual work center	Lathe 17
Work center group	Turnery
Production line	Line 9
Individual employee	J. Jordan
Personnel group	Pool 19

Table 2.1 Work Center Examples

You define work centers within a plant and assign them to cost centers. You first create work centers, which you then list in routings to manufacture assemblies.

You can view or change work centers with Transaction CRO2 or via menu path **Logistics • Production • Master Data • Work Centers • Work Center • Change**. Each work center contains a **Costing** tab with a mandatory cost center field and activity type fields. When you manually plan an activity price with Transaction KP26, you create a connection between the activity type and cost center/work center.

2.1.4 Routing

A routing is a list of tasks containing standard activity times required to perform operations to build an assembly. Routings, together with planned activity prices, provide cost estimates with the information necessary to calculate activity costs for products. You can view or change routings with Transaction CA02 or via menu path **Logistics • Production • Master Data • Routings • Routings • Standard Routings • Change**.

Routings are time-dependent and have validity dates. When you select a routing with Transaction CA02, you must nominate a key date in addition to the material, plant, and task list type. The task list type defines whether it's a standard routing or a rate routing for repetitive manufacturing.

An example of a routing is shown in Figure 2.11. The routing contains operations 10 through 50 required to manufacture this assembly. Each operation is performed at a work center.

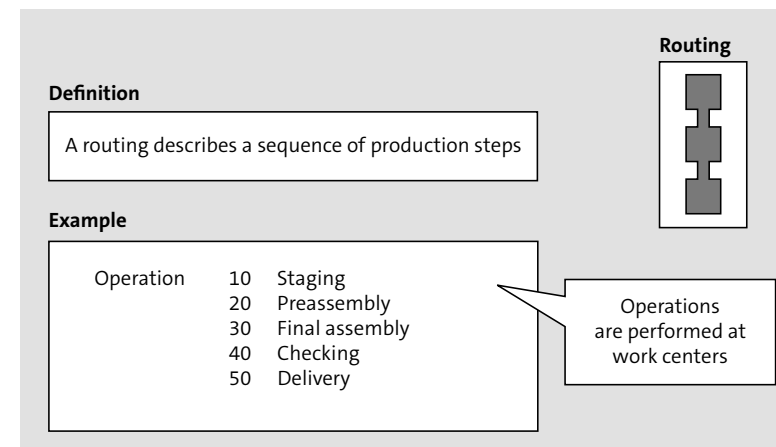


Figure 2.11 Example of a Routing

Each operation in a routing contains many fields and indicators. The most relevant to variance analysis are the **Standard value** field and **Costing Relevancy** indicator. The **Standard value** field indicates how long it takes to perform the task. The standard value multiplied by the planned activity rate provides planned activity costs. The calculation can be modified by a performance efficiency rate and formula. Activity costs are rolled up from subassemblies to the finished product.

All components in the BOM are staged to the first operation in the routing by default. You can assign components correctly to each operation for more accurate work in process (WIP) and scrap valuation. This also ensures that the costs per operation are displayed correctly in the Analyze Costs by Work Center/Operation app.

You can include overhead costs in the planned activity rate. Dedicated overhead activity types can also be used to include overhead costs. The manufacturing order or product cost collector is debited and the cost center is credited at the time of activity confirmation. Overhead can also be included in the standard price with costing sheets and processed during the confirmation or at period end, as described in Section 2.2.

2.1.5 Product Cost Collector

After BOMs and routings are created, you can create production orders as standalone cost objects or link several to product cost collectors as umbrella cost objects. If you're using product cost by period, you don't create production orders, and product cost collectors contain information relating to which BOM and routing the cost estimate should access because there may be several alternative methods of manufacture.

A product cost collector also collects actual costs during the production of a material. Product cost collectors are necessary for repetitive manufacturing and optional for order-related manufacturing. Repetitive manufacturing eliminates the need for

production or process orders in manufacturing environments with production lines and long production runs. It reduces the work involved in production control and simplifies confirmations and goods receipt postings.

Several advantages result from using product cost collectors:

- Period-end closing and reporting performance are improved because there are fewer cost objects than with product cost by order. When you create manufacturing orders, they are automatically assigned to a product cost collector per material.
- Variance analysis is carried out for a product instead of a manufacturing order. It's usually more useful for managers to know how efficiently different products are manufactured, compared to the efficiency of a particular manufacturing order.
- You calculate and post WIP at target and variance together each period-end, making variances easier to reconcile with general ledger reporting.

You can create, change, or view product cost collectors with Transaction KKF6N or via menu path **Accounting • Controlling • Product Cost Controlling • Cost Object Controlling • Product Cost by Period • Master Data • Product Cost Collector • Edit**. A selection screen is displayed, as shown in Figure 2.12.

Figure 2.12 Display Product Cost Collector

A product cost collector contains all the information needed to manufacture a product, including fields relevant to variance analysis. To display the fields, proceed as follows:

1. Fill in the relevant information for the **Material** and **Plant** fields.
2. Select a **Production Version** indicator on the left.

3. Press **Enter** to display details of the product cost collector on the right. The **Planned Costs Costin** field contains the costing variant used to create the preliminary cost estimate.

We'll discuss costing variants further in Section 2.4, and we'll cover preliminary cost estimates in Section 2.7. The **Variance Key** field shown at the bottom of Figure 2.12 defaults from the **Costing 1** view when the product cost collector is created.

2.2 Overhead Costs

With master data created and set up correctly, the structure is in place for the cost estimate to determine material and activity costs. In this section, we'll look at how to include overhead costs in the cost estimate.

In addition to material and activity costs, we need to include overhead costs in the finished product standard price. *Overhead costs* may include, for example, building leases, insurance, and general office staff not directly involved in the production process.

You can add overhead with any of these alternatives as discussed in the following sections:

- Activities
- Templates
- Costing sheets

2.2.1 Activities

You can either increase the planned activity price to include overhead with Transaction KP26, or you can create separate overhead activity types with Transaction KLO1 or by following menu path **Accounting • Controlling • Cost Center Accounting • Master Data • Activity Type • Individual Processing • Change**.

Advantages of using activities for overhead allocation include the following:

- Real-time overhead posting during activity confirmation
- Minimal configuration requirement

Disadvantages include the following:

- Increased activity type data setup in work centers and routings
- Increased maintenance during activity confirmations

Activity types describe activities provided by cost centers and allow costs to be allocated to receiving objects such as manufacturing orders, product cost collectors, and other cost centers. We'll follow a detailed example of confirming an activity in Chapter 3, Section 3.4.2.

2.2.2 Templates

Templates allow you to allocate overhead via drivers and formulas. Templates use functions to access data as a basis to determine the allocation proportions dynamically. Templates also use formulas to perform calculations on the data accessed by functions.



Template

You can use the number of employees in a department for calculating personnel planned overhead costs.

You create a template with Transaction CPT1 or via menu path **Accounting • Controlling • Product Cost Controlling • Period-End Closing • Product Cost by Order • Template Allocation • Individual Processing • Extras • Template • Create**. The screen shown in Figure 2.13 is displayed.

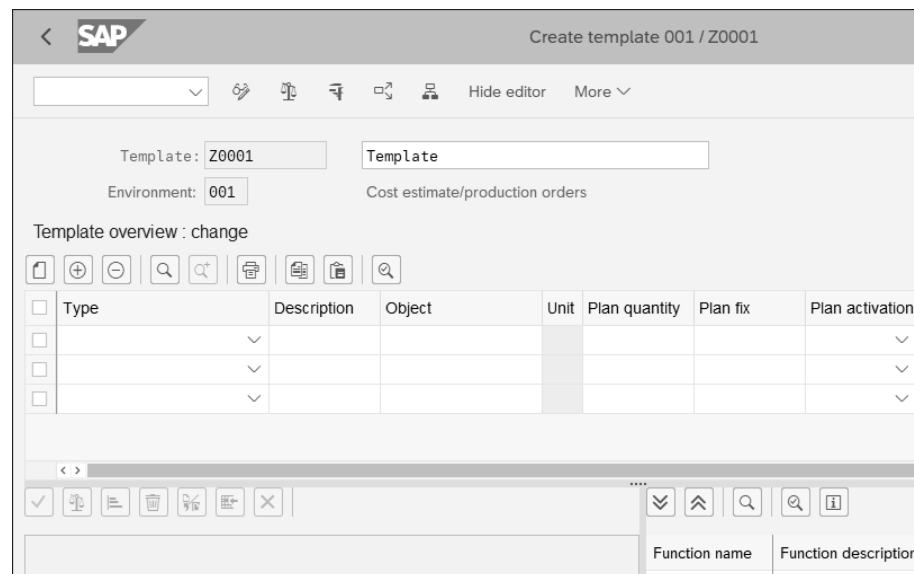


Figure 2.13 Create Template

Name your **Template**, and select an **Environment**. Environments determine the columns available in a template. You define an environment with Transaction CTU6 or by following IMG menu path **Controlling • Product Cost Controlling • Product Cost Planning • Basic Settings for Material Costing • Templates**.

At period close, you run template allocation for production orders with Transaction CPTA or menu path **Accounting • Controlling • Product Cost Controlling • Period-End Closing • Product Cost by Order • Template Allocation • Individual Processing**.

2.2.3 Costing Sheets

Costing sheets offer flexibility in allocating overhead across products or product groups on a percentage rate basis. Configuration is required, as explained in the following sections.

Overview

Let's inspect the configuration of a costing sheet to see how it works. You view configuration settings with Transaction KZS2 or by following IMG menu path **Controlling • Product Cost Controlling • Product Cost Planning • Basic Settings for Material Costing • Overhead • Define Costing Sheets**. The screen shown in Figure 2.14 is displayed.

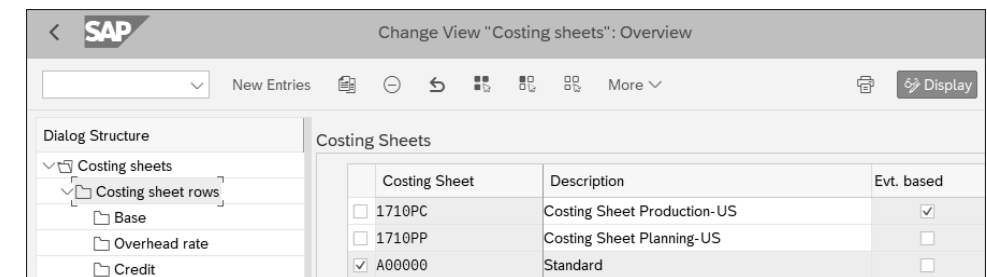


Figure 2.14 Costing Sheets: Overview Screen

Available costing sheets are listed on the right of the overview screen. You activate a costing sheet for event-based overhead calculation by selecting the checkbox in the **Evt. based** column. When you issue goods to a production order or confirm activities, you increase the order costs in real time. We'll explore this in more detail in Chapter 7.

You can use existing costing sheets or copy one and create your own. Let's choose an example costing sheet and examine the components via the following steps:

1. Select **Costing Sheet A00000** in this example.
2. Double-click on **Costing sheet rows** on the left.

The screen shown in Figure 2.15 is displayed. The three costing sheet components **Base**, **Overhead rate**, and **Credit** are listed on the left of the screen, while their values are displayed on the right. We'll describe these next.

When overhead is calculated during period-end (discussed in Chapter 4, Section 4.4.1), the manufacturing order or product cost collector receives a debit, and a cost center receives a credit with the calculated overhead value.

Row	Base	Overhead Rate	Description	From	To Row	Credit
<input type="checkbox"/> 10	B000		Material			
<input type="checkbox"/> 20		C000	Material OH	10		E01
<input type="checkbox"/> 30			Material usage.....			
<input type="checkbox"/> 40	B001		Wages			
<input type="checkbox"/> 45	B002		Salaries			
<input type="checkbox"/> 50		C001	Manufacturing OH	40	45	E02
<input type="checkbox"/> 60			Manufacturing costs...	40	50	
<input type="checkbox"/> 70			Cost of goods manufactured...			
<input type="checkbox"/> 80		C002	Administration OH			E03
<input type="checkbox"/> 90		C003	Sales OH	70		E04
<input type="checkbox"/> 100			Cost of goods sold...			

Figure 2.15 Costing Sheets: Rows Overview

Calculation Base

A base is a group of cost elements that you apply overhead to. Each cost element identifies unique cost types within a cost estimate, such as raw material or machining costs. These costs, identified by the base, are then multiplied by an overhead rate to determine the overhead value in the cost estimate.

You can combine cost elements in base rows. For example, you can calculate material overhead on a base consisting of cost elements when raw materials are issued from inventory to a production order.

To see how cost elements are entered in a base, select any **Row** with an entry in the **Base** column (row 10 in this example) in the screen shown in Figure 2.15, and double-click on **Base** on the left to see the screen shown in Figure 2.16.

	From CElem	To CstElem	Cost Elem.Group	From	To Orgn
<input type="checkbox"/>	400000	402999			
<input type="checkbox"/>	406000	406999			

Figure 2.16 Calculation Base Overview

You enter individual cost elements or ranges in the **From CElem** and **To CstElem** columns. You can also enter a cost element group in the **Cost Elem.Group** column. You can identify materials within cost elements by entering an origin group in the **To Orgn** column, and in the **Costing 1** view. You can also divide the calculation base into **Fixed** and **Variable** costs by selecting the appropriate radio button.

Overhead Rate

The overhead rate is a percentage applied to the calculation base (group of cost elements). To see how percentage rates are entered in an overhead rate, select any row with an entry in the **Overhead Rate** column shown previously in Figure 2.15 (row 20 in this example), and double-click on **Overhead rate** at the left of the screen. The screen shown in Figure 2.17 is displayed.

	Valid From	To	CO Area	Ovrhd Type	Percentage	Unit
<input type="checkbox"/>	01/01/2022	09/30/2022	A000	1	8.200 %	
<input type="checkbox"/>	01/01/2022	09/30/2022	A000	2	8.200 %	
<input type="checkbox"/>	01/01/2023	09/30/2023	A000	1	8.210 %	
<input type="checkbox"/>	01/01/2023	09/30/2023	A000	2	8.210 %	

Figure 2.17 Overhead Rate Overview

The **Dependency** field allows the same overhead rate to be applied to all materials within a plant or company code. Other dependencies are available, allowing different rates to be applied per order type or overhead key. Overhead keys can be entered per individual manufacturing order or product cost collector. This provides a high level of control and flexibility with corresponding increased setup and maintenance requirements.

Overhead rates are date dependent, allowing different rates to be entered per fiscal year or fiscal period. Before using this functionality at its most detailed level, be sure the maintenance effort required is offset by any increased overhead allocation accuracy.

You can also maintain percentage overhead rates with Transaction S_ALR_87008275 and quantity-based overhead rates with Transaction S_ALR_87008272, or by following menu path **Accounting • Controlling • Product Cost Controlling • Cost Object Controlling • Product Cost by Period • Period-End Closing • Current Settings**.



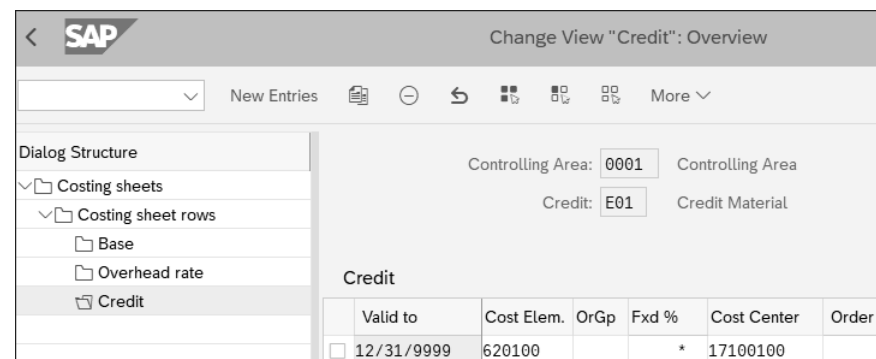
Current Setting Configuration for Users

Current settings allow you to perform some configuration transactions via the standard user menu path. Because you may need to update costing sheet rates routinely, you can allow users to easily make these changes.

Refer to SAP Note 310768 for further information on current settings for costing sheets.

Credit Key

You assign a credit key in the **Credit** column shown previously in Figure 2.15 to each costing sheet row with an entry in the **Overhead Rate** column. During overhead allocation, a manufacturing order or product cost collector is debited, and a cost center is credited. The credit key defines which cost center receives the credit. To display how a cost center is entered in a credit key, select any row with an entry in the **Credit** column (shown earlier in Figure 2.15, row 20 in this example), and double-click on **Credit** in the left of the screen. The screen shown in Figure 2.18 is displayed.



Valid to	Cost Elem.	OrGp	Fxd %	Cost Center	Order
12/31/9999	620100		*	17100100	

Figure 2.18 Credit Overview

Enter the cost center to receive the overhead credit in the **Cost Center** column. A secondary cost element is a required entry in the **Cost Elem.** column. The secondary cost element identifies the *plan* overhead cost in the cost estimate and the *actual* overhead debit in the manufacturing order and product cost collector cost reports. It also identifies the overhead credit to the cost center in cost center reports. See Chapter 6 for more information on reporting in SAP S/4HANA.

An entry in the **Fxd %** field will ensure that the fixed and variable costs are correctly assigned in the contribution margin scheme. An entry of an asterisk, as shown in Figure 2.18, means that the fixed and variable portions of the surcharge are determined in the same way as the fixed and variable costs in the calculation base, as shown previously in Figure 2.16.

2.3 Cost Components

Now that we've completed master data and costing sheet creation and maintenance, structures are in place for the cost estimate to determine material, activity, and overhead costs. The next step is to instruct the cost estimate on how to group costs together for the cost estimate cost component view. This complements the basic itemization view, which is a simple listing of items in the cost estimate. The most common cost components are materials, labor, and overhead. You can create your own cost components with the procedure described in this section.

The *cost component split* allows a cost estimate to group costs of similar types, such as material, labor, and overhead. Analysis of cost components over time or across a range of products can assist you in profitability analysis. Cost components increasing over time may result in a focus to reduce material, labor, or overhead costs. Comparison of cost components across products can influence marketing decisions. A manufacturing company may decide to focus on products that require less labor and overhead, or a company may be interested in analyzing the results of efforts to reduce activity costs.

All individual costs are identified by cost elements. Accounts of primary cost element type may identify costs such as material consumed from inventory or external processing costs. Accounts of secondary cost element type may identify labor, overhead, or process costs allocated to production orders or product cost collectors from cost centers. Cost components group similar account types together.

Cost components consider material costs, which are rolled up through the BOM. Value additions by activities performed on subassemblies are also grouped together and rolled upward through the BOM and routing to the higher-level cost estimate.

When you issue a subassembly to a production order, all costs are under the one material account. When you look at the subassembly in the cost estimate, cost components allow you to see the breakdown of raw material, activity, and overhead in that subassembly. You can also see this breakdown in actual costing (if enabled).

Let's look at the configuration of a cost component structure to see how cost components are rolled up by account type. You view cost component structure configuration settings with Transaction OKTZ or via IMG menu path **Controlling • Product Cost Controlling • Product Cost Planning • Basic Settings for Material Costing • Define Cost Component Structure**. The screen shown in Figure 2.19 is displayed.

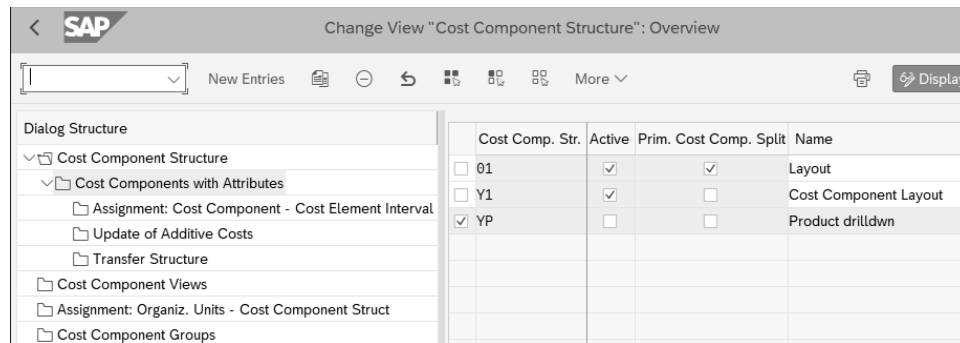


Figure 2.19 Cost Component Structure Overview

Available cost component structures are listed on the right of the overview screen. We'll walk through the key configuration activities in the following sections.

2.3.1 Primary Cost Component Split

Select the **Prim. Cost Comp. Split** checkbox to nominate a cost component structure as a primary cost component split, which identifies primary costs such as energy, wages, and depreciation.

You can use existing cost component structures or copy one and create your own by choosing the **New Entries** button. Let's choose a cost component structure shown in Figure 2.19 and examine the components with the following steps:

1. Select cost component structure **YP** (shown as selected).
2. Double-click on **Cost Components with Attributes** from the **Dialog Structure** on the left.

The screen shown in Figure 2.20 is displayed.

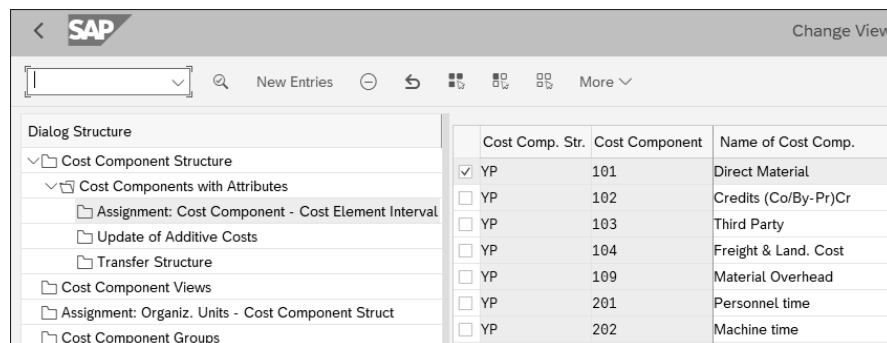


Figure 2.20 Cost Components with Attributes Overview

Available cost components are listed on the right of the overview screen. You can use existing cost components or copy one and create your own. You can have up to 120 cost

components that contain variable costs. For cost components that contain full costs, the system creates a second cost field for the fixed costs. This means that you can have up to 60 cost components that contain both fixed and variable costs.

2.3.2 Assign Cost Elements

Let's choose **Cost Component 101** and examine the components via the following steps:

1. Select **Cost Component 101** (shown as selected in Figure 2.20 previously).
2. Double-click on **Assignment: Cost Component - Cost Element Interval** from the **Dialog Structure**.

The screen shown in Figure 2.21 is displayed.

Dialog Structure	Cost Comp. Str.	Chart of Accts	From cost eL.	Origin Group	To cost elem.	Cost Component	Name of Cost Comp
<input type="checkbox"/> Cost Component Structure	<input type="checkbox"/> YP	YCOA	51100000		51100000	101	Direct Material
<input type="checkbox"/> Cost Components with Attributes	<input type="checkbox"/> YP	YCOA	51500000		51500000	101	Direct Material
<input checked="" type="checkbox"/> Assignment: Cost Component	<input type="checkbox"/> YP	YCOA	51600000		51600000	101	Direct Material
<input type="checkbox"/> Update of Additive Costs	<input type="checkbox"/> YP	YCOA	51700000		51700000	101	Direct Material
<input type="checkbox"/> Transfer Structure	<input type="checkbox"/> YP	YCOA	51950000		51950000	101	Direct Material
<input type="checkbox"/> Cost Component Views	<input type="checkbox"/> YP	YCOA	54300000		54300000	101	Direct Material
<input type="checkbox"/> Assignment: Organiz. Units - Cost C.	<input type="checkbox"/> YP	YCOA	54400000		54400000	101	Direct Material
<input type="checkbox"/> Cost Component Groups	<input type="checkbox"/> YP	YCOA					

Figure 2.21 Cost Element Assignment Overview

Individual cost elements or cost element ranges are assigned to cost components in the **From cost el.** (from cost element) and **To cost elem.** (to cost element) columns.

2.3.3 Assign Origin Groups

An **Origin Group** assigned in the **Costing 1** view allows you to assign cost components to an individual material level of detail if required. See Section 2.1.1 for more details on the **Costing 1** view.

Further Resources

You can find more about assigning origin groups to material masters in SAP Note 1445940.

With master data, costing sheet, and cost component setup completed, we've nearly finished the preparations needed to create a cost estimate. The one remaining step is to set up the costing variant, which we'll discuss in detail next.

2.4 Costing Variant

The costing variant determines how a cost estimate calculates the standard price, for example, whether the purchasing info record price is used for purchased materials or an estimated price manually entered in the **Planned price 1** field of the **Costing 2** view. Only the standard cost estimate adjusts inventory values. In this section, we'll explore the costing variant details.

Let's inspect the configuration of a costing variant. You view costing variant configuration settings with Transaction OKKN or by following IMG menu path **Controlling • Product Cost Controlling • Product Cost Planning • Material Cost Estimate with Quantity Structure • Define Costing Variants**. The screen shown in Figure 2.22 is displayed.

Costing Variants	
Costing Variant	Name
<input type="checkbox"/> PPC1	Standard Cost Est. (Mat.)
<input type="checkbox"/> PPC2	Mod. Std Cost Est. (Mat.)
<input type="checkbox"/> PPC3	Current Cost Est. (Mat.)
<input type="checkbox"/> PREM	Prel. Cstg Cost Collector
<input type="checkbox"/> PYC1	Cost Estimate Standard

Figure 2.22 Costing Variants: Selection Screen

Available costing variants are listed in the **Costing Variant** column. Let's examine the first costing variant, **PPC1** in this example, by double-clicking on it. The screen shown in Figure 2.23 is displayed.

Figure 2.23 Costing Variant PPC1 Details

The costing variant components are shown as buttons on the left. Let's examine the four most commonly used components, starting with the **Costing Type**, in the following sections.

2.4.1 Costing Type

Click on the **Costing Type** button to display the screen shown in Figure 2.24. You can also access costing type configuration with Transaction OKKI or IMG menu path **Controlling • Product Cost Controlling • Product Cost Planning • Material Cost Estimate with Quantity Structure • Define Costing Variants • Costing Variant: Components • Define Costing Types**.

Figure 2.24 Costing Type: Details Screen

The costing type determines if the cost estimate can update the standard price in the material master.

You might create cost estimates that can't update the standard price for the following reasons:

- A product development department may need to create cost estimates with the **No Update** option as they develop and cost prototypes and new products.
- For specialized inventory valuation, you may update the **Tax-Based Price** or **Commercial Price** fields in the **Accounting 2** view, as discussed in Section 2.1.1.
- You can use the **Prices Other Than Standard Price** option to update the **Planned price 1, 2, and 3** fields in the **Accounting 2** view to record estimated purchase price history.

In variance analysis, we're interested in costing variants that can update the material master standard prices with costing type 1 (**Standard Price**) because the standard price is the benchmark for production and purchasing activities, and it's the basis for calculating total variance, as we'll discuss in Chapter 4.

2.4.2 Valuation Variant

Next, click on the **Valuation Variant** button shown previously in Figure 2.23 to display the screen shown in Figure 2.25. You can also access valuation variant configuration with Transaction OKK4 or IMG menu path **Controlling • Product Cost Controlling • Product Cost Planning • Material Cost Estimate with Quantity Structure • Define Costing Variants • Costing Variant: Components • Define Valuation Variants**.

Priority	Strategy Sequence	Incl. Additive Costs
1	L Price from Purchasing Info Record	<input checked="" type="checkbox"/>
2	4 Planned Price 1	<input checked="" type="checkbox"/>
3		<input type="checkbox"/>
4		<input type="checkbox"/>
5		<input type="checkbox"/>

Priority	Strategy Sequence
1	4 Gross Quotation Price
2	A Quotation Price via Condition Table
3	

Figure 2.25 Valuation Variant Details

The valuation variant allows different search strategies for materials, activity types, subcontracting, and external processing. The material search strategy, shown in the **Material Val.** tab in Figure 2.25, indicates that the cost estimate first searches for purchasing info records containing the material price, due to the **L Price from Purchasing Info Record** entry next to **Priority 1**. Here, **L** and **4** are the keys of the strategy sequence, while the text following the keys is the description. If unsuccessful, it will then search for an entry in the **Planned price 1** field in the **Costing 2** view. If still unsuccessful, an error message will be issued, which you must correct before the cost estimate can be released.

You display a purchasing info record with Transaction MEIM or menu path **Logistics • Materials Management • Purchasing • Master Data • Info Record • List Displays • By Material**. A selection screen is displayed, as shown in Figure 2.26.

Figure 2.26 List Display Info Record: Selection Screen

Enter a **Material** and **Plant**, and execute to display the screen shown in Figure 2.27.

Material R-311
RAW311,PD

Supplier	Name	Info Rec.	Rule	De
P.Org	InfoCat	Plnt	PGp	Plan Time
Price Origin	Net Price	Currency	Qty	Un Document Item QDp
17300001	Domestic US Supplier 10		5300000000	
<input checked="" type="checkbox"/>	1710 Standard	1710 001	5 Days	0 PC
Condition	10.00	USD	1 PC	Net 12/31/9999
Pur. Order	10.00	USD	1 PC	4500000000 00010 04/11/2022

Figure 2.27 List Display Info Record

Double-click **Standard** to display the screen shown in Figure 2.28.

Figure 2.28 Purchasing Info Record Price Condition

This displays the price that the valuation variant search strategy shown previously in Figure 2.25 will locate with the first strategy.

You can also enter search strategies for **ActivityTypes/Processes**, **Subcontracting**, and **Ext. Processing** by clicking on the corresponding tabs shown previously in Figure 2.25.

2.4.3 Date Control

Next click on the **Date Control** button shown previously in Figure 2.23 to display the screen shown in Figure 2.29. You can also access date control configuration with Transaction OKK4 or IMG menu path **Controlling • Product Cost Controlling • Product Cost Planning • Material Cost Estimate with Quantity Structure • Define Costing Variants • Costing Variant: Components • Define Date Control**.

Default Values		
Date	Manual Entry	Default Value
Costing Date From	<input checked="" type="checkbox"/>	N Start of Next Month
Costing Date To	<input checked="" type="checkbox"/>	Q Maximum Value
Quantity Structure Date	<input checked="" type="checkbox"/>	A Costing Date From
Valuation Date	<input checked="" type="checkbox"/>	A Costing Date From

Figure 2.29 Date Control Details

When you create a cost estimate, the four dates proposed correspond to the dates assigned in the **Default Value** tab. If you select the **Manual Entry** checkbox, you can change the proposed dates when you create a cost estimate.

Let's examine each of the four dates:

■ Costing Date From

Determines the start date of the cost estimate. The cost estimate can't be marked and released until the start date. You can change the start date to a previous date and create the cost estimate. However, you can't save, mark, or release a standard cost estimate with a start date in the past.

■ Costing Date To

Determines the finish date of the cost estimate. Variance calculation requires a standard cost estimate that is valid for the entire fiscal year. You typically set this date to either the maximum date or the end of the current fiscal year.

■ Quantity Structure Date

Determines which BOM and routing you select for the cost estimate. Because these can change over time, it's useful to select a BOM or routing by date.

■ Valuation Date

Determines which material and activity prices you select for the cost estimate. Purchasing info records can contain different vendor quotation prices valid for different dates. You can also plan different activity prices per period. During product development, for example, you may hold the valuation date constant while changing the quantity structure date to isolate the cost effect of changing the structure of a BOM.

2.4.4 Transfer Control

Next, click on the new page icon to the right of the **Transfer Control** button shown previously in Figure 2.23 to display the screen shown in Figure 2.30. You can also access transfer control configuration with Transaction OKKM or IMG menu path **Controlling • Product Cost Controlling • Product Cost Planning • Material Cost Estimate with Quantity Structure • Define Costing Variants • Costing Variant: Components • Define Transfer Control**.

Transfer Control	Name
<input type="checkbox"/> PC01	Transfer w/ Plant Change
<input type="checkbox"/> PC02	Complete Transfer
<input type="checkbox"/> PC03	Sales Order KDN

Figure 2.30 Transfer Control Overview

Double-click **PC02 (Complete Transfer)** to display the screen shown in Figure 2.31.

You can transfer existing cost estimates for subassemblies and components within a single plant to a new cost estimate. This avoids re-costing existing materials between annual runs.

The strategy sequence (**Strategy Seq.**) determines the order in which the system searches for existing cost estimates. If the system can't find an existing cost estimate that meets the requirements of any of the strategies, it creates a new cost estimate.

Select the **Fiscal Year** checkbox to search for a cost estimate with a start date in the current fiscal year.

For **Current** and **Previous** cost estimates, the **Periods** field refers to the number of periods in the past.

Transfer Control

A company has several plants, and an individual cost accountant is responsible for each plant. Costing runs with transfer control PC01 will create and release new cost estimates within a single plant without using any existing cost estimates. The costing run, however, will use existing cost estimates from other plants if available because the cross-plant transfer control strategy is the same as shown in Figure 2.31. This allows cost accountants to create and release new cost estimates only in their own plants.

[Ex]

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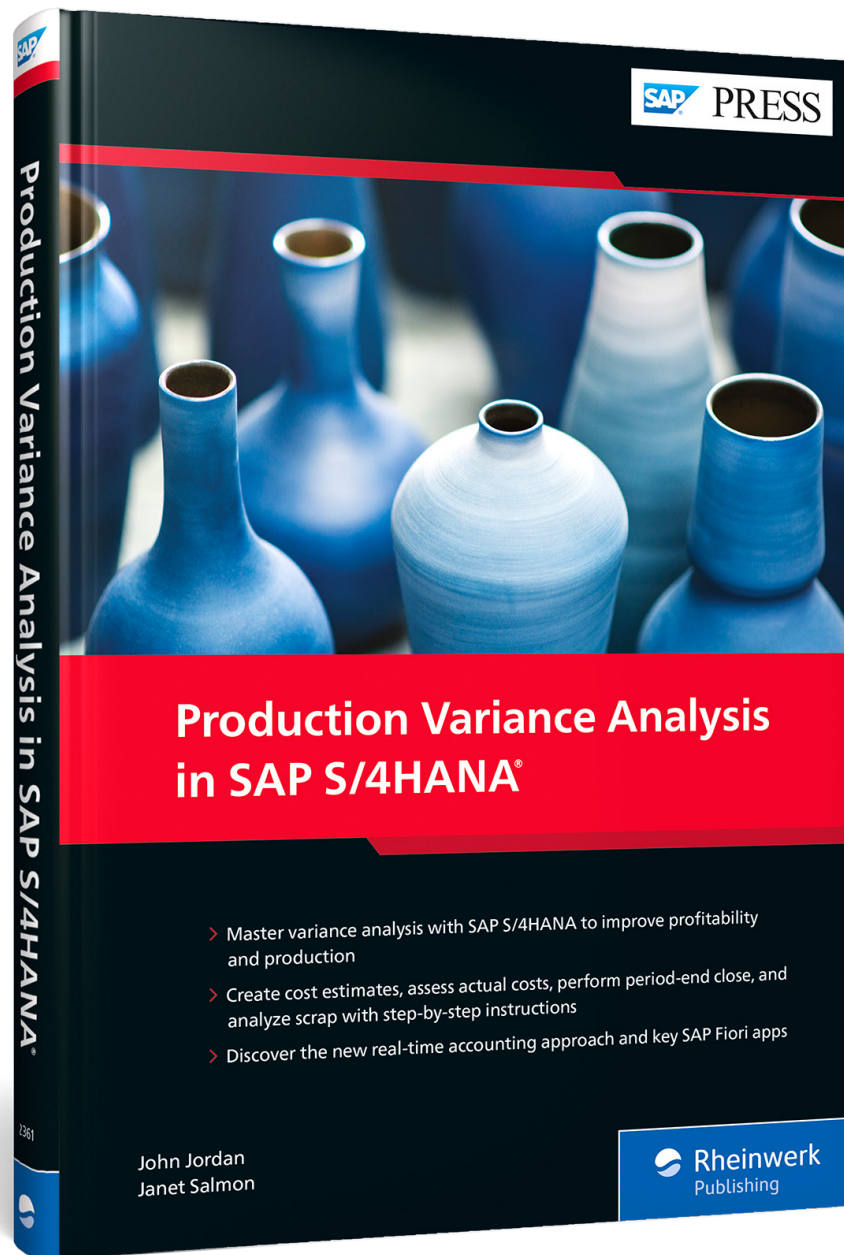
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John Jordan is founder and principal consultant at ERP Corp, which provides expert SAP controlling consulting. John runs the annual SAP Controlling Financials conference in San Diego, which had its 10-year anniversary in 2022. John is also the author of *100 Things You Should Know About Controlling with SAP* (2015) and *Product Cost Controlling with SAP* (2016), both of which are SAP PRESS bestsellers. You can reach John at jjordan@erpcorp.com.



Janet Salmon is the chief product owner for management accounting at SAP SE and has accompanied many developments to the controlling components of SAP ERP Financials as both a product and a solution manager. She regularly works with key customers and user groups in the United States and Germany to understand their controlling challenges and requirements. Her role is to design and implement innovative controlling solutions with SAP's development teams in Germany and China.

John Jordan, Janet Salmon

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