This chapter shows you how to enrich their data using characteristics and valuation in costing-based profitability analysis.
Chapter 5

Enriching Data

Enriching data enables you to leverage all benefits of characteristic derivations to improve the relevance of your reporting. This chapter also explains how to use various costing variants to valuate the sales quantity in costing-based Profitability Analysis.

Enriching data means that you can derive more characteristics for reporting and automate the derivation of characteristics, which avoids incorrect or missing characteristic derivations. This chapter provides tips and tricks on how to enrich your reporting and automate the settlement process.

It also describes how to valuate sales quantities with various values when using costing-based Profitability Analysis to provide various valuations/costing variants for sales quantities. This function is only available in costing-based Profitability Analysis because account-based Profitability Analysis only permits valuations with the valuation price that is valid when the goods are issued.

5.1 Enriching Data: Characteristics

This section explains how to use characteristic hierarchies and automate the characteristic derivation process and creation of settlement rules. This helps you make sure that all documents are supplied with the correct characteristics and are settled properly, which ensures smooth month-end closings by reducing potential sources of error.

5.1.1 Deriving Product Hierarchies

You define product hierarchies in Customizing and maintain them in the Basic Data 1 view and/or in the Sales: Sales Org. 2 view in the material master. Product hierarchies have several levels and are intended to permit the
aggregation of products according to product-specific characteristics in reports. In the SAP standard, product hierarchies can have up to three levels. When defining the levels, you should make them easy to enhance and adapt to the growth of your enterprise. You use Transaction V/76 to create product hierarchies in Customizing as shown in Figure 5.1. Unfortunately, they can’t be visualized as a tree. Therefore, you should maintain them offline in a separate file for the sake of clarity.

Three-level product hierarchy

In our example, a three-level product hierarchy is maintained. You can define any type of numbering for your product hierarchy. Level 1 can consist of up to five characters, level 2 can also consist of up to five characters, and level 3 can consist of up to eight characters.

Figure 5.1 Maintaining the Product Hierarchy in the SAP System

Subdivision of product hierarchies

As illustrated in Figure 5.2, product hierarchies can be subdivided as follows:

- **Level 1 (product type/family)**
  Electronic products, treadmills, pharmaceutical products, and so on.

- **Level 2 (product line/segment)**
  Appliances, T200 series, painkillers, and so on.

- **Level 3 (product form/brand)**
  Washing machine, ellipticals, aspirin, and so on.

As already mentioned, product hierarchies are defined in the material master. The assignment to the product hierarchy in View Basic Data 1 may differ from that in View Sales: Sales Org. 2. This makes sense, for example, if there is a product that can be sold for medical and private use. The system outputs a warning message that indicates a deviating assignment of the product hierarchy in the general data and sales-specific data at the bottom of the screen when you create/change the material (see Figure 5.3).

Figure 5.2 Defining the Product Hierarchy

Figure 5.3 Maintaining the Product Hierarchy in the Material Master
To derive the characteristics of product hierarchies in account-based and costing-based Profitability Analysis (CO-PA) for the Profitability Analysis document, you have to assign the characteristics to the operating concern. The product hierarchy as a whole is Characteristic PRODH (Product Hierarchy), which can be added to the operating concern via the characteristics.

Creating characteristics

If you want to transfer individual characteristics of the product hierarchy, you first have to create the characteristics using Transaction KEA5 or the Controlling • Profitability Analysis • Structures • Define Operating Concerns • Maintain Characteristics Customizing path. In the Create Characteristic section in the Edit Characteristics: Start screen, select Create/Change. The system then displays the Create Char.: Assignment dialog box (see Figure 5.4 on the right). In the dialog box, select Transfer from SAP table, enter table “MVKE” (Sales Data) for the material into the Table field in the Table Fields section, and confirm your entries using (Enter).

![Figure 5.4 Creating Characteristics for the Product Hierarchy](image)

The Edit Characteristics: Start screen in Figure 5.5 provides an overview of all characteristics from table MVKE that can be assigned or have already been assigned to the operating concern. Select Characteristics PAPH1, PAPH2, and PAPH3. These characteristics map the three levels of the product hierarchy. After selecting the characteristics, confirm your entries by pressing Enter to transfer the characteristics.

![Figure 5.5 Transferring the Characteristics of the Product Hierarchy from Table MVKE](image)

You can transfer all characteristics at once without having to select them individually.

Figure 5.6 shows the characteristics the system wants to create. You can change the description or short text of the characteristics. Activate the characteristics using (Activate), and save your settings.

The characteristics have been created now and can be assigned to the operating concern by calling Transaction KEA0 or following the Controlling • Profitability Analysis • Structures • Define Operating Concerns • Maintain Operating Concerns Customizing path. Chapter 3 explained how to assign newly created characteristics to the operating concern. In Figure 5.7, you can see that Characteristics PAPH1, PAPH2, and PAPH3 are now available in the Transfer from section of the characteristic overview.
After assigning the characteristics to the operating concern, you have to generate the operating concern again.

Now, create a sales order with a material that you’ve assigned to a product hierarchy. When transferring sales order stock to costing-based Profitability Analysis, the product hierarchy is already derived in the Profitability Analysis document. When the billing document for the sales order is created, the product hierarchy is transferred to the Profitability Analysis document as a characteristic in costing-based and account-based Profitability Analysis.

Figure 5.8 shows the costing-based Profitability Analysis document with the characteristics of the product hierarchy.
Figure 5.9 shows the Profitability Analysis document of account-based Profitability Analysis in database table ACDOCA (Universal Journal) with the characteristics of the product hierarchy.

You can now valuate the characteristics of the product hierarchy in reporting.

5.1.2 Using Characteristics Hierarchies

In costing-based Profitability Analysis, you can use characteristics hierarchies to group characteristics and map hierarchies.

You don’t have to create a new characteristic for characteristics hierarchies. You can group characteristics in Customizing by calling Transaction KES3 or using the following Customizing path: Controlling • Profitability Analysis • Master Data • Characteristic Values • Maintain Characteristics Hierarchies.

In the Hierarchy Processing screen (see Figure 5.10), you can create new characteristics hierarchies and change existing hierarchies.

The characteristic table at the left lists all characteristics of the operating concern. Select the characteristic for which you want to create a new characteristics hierarchy by clicking on the respective line. In the Variant field, you enter a name or an alias with which the characteristics hierarchy should be created. Click on the Create/Change button to create the characteristics hierarchy.

In the Short description field in the Hierarchy Maintenance: Hierarchy Attributes screen, enter a description for the characteristics hierarchy (see Figure 5.11). In this example, you create a characteristics hierarchy to sort your customers.
When you click on the Hierarchy button (Entire Hierarchy), the system displays a screen in which you can maintain the characteristics hierarchy (see Figure 5.12). Define the nodes using buttons Same Level and Lower Level.

Assign the corresponding customer numbers to the individual customer nodes; you can use the (F4) key as the input help. Click on (Save) to save the characteristics hierarchy.

After the characteristics hierarchy has been created and saved, it’s available for use in the profitability reports. In the definition of the report or form, you specify whether the characteristics hierarchy should be used for the report or not.

To create profitability reports, follow the Accounting • Controlling • Profitability Analysis • Infosystem • Define Reports • Create Operating Concerns Customizing path or call Transaction KE31.

Create a report with form by clicking on the With Form option in the Report Type: Report section. Enter a technical name, and click on the Form button. A new window opens. Enter a description for the form, and click on the Create button. Now, double-click on a line, and select the Characteristic Overview option in the dialog box that opens. Confirm your entries with Enter. A new window opens. In the element definition, activate hierarchy node (Change Hierarchy Node) and variable (Change Variable Entry) for the Customer characteristic.

The system displays the Hierarchy class selection Customer dialog box (see Figure 5.13). You can assign the line of the customer hierarchy that is created and maintained in SAP ERP Sales and Distribution (SAP ERP SD) but often doesn’t correspond to the controlling structure, or you can select the SAP-EIS: Hierarchies option. This refers to the characteristics hierarchies that you’ve created in Customizing. Press Enter to confirm your entries.

In the Hie:Customer field, enter the characteristics hierarchy created by you ("Z1"), which will be displayed in the report. In the Grp:Customer field, enter the "RETAIL" hierarchy node to display the sales quantity for all customers that are assigned to the Retail node (see Figure 5.14).
You can’t use the characteristics hierarchies that you’ve created using Transaction KES3 in account-based Profitability Analysis. However, you can use sets to set up similar structures as in characteristics hierarchies. To create sets, call Transaction GS01 or follow the Accounting • Financial Accounting • Special Ledgers • Tools • Set Maintenance • Sets • Create Customizing path.

In Create Set: Initial Screen, you specify the set name (Customer Hierarchy) and table in which the characteristic is stored that you want to group. As you can see in Figure 5.16, you enter table “BSEG” (Accounting Document Segment) in the Table field in the Basic Data section. Of course, you can also create the set using table ACDOCA (Universal Journal). Because table BSEG is still available as a view, you can also create the set using table BSEG.

After entering the Set Name (“Customer Hierarchy”) and Table (“BSEG”), confirm your entries with Enter to create a basic set.
The system then displays the **Create Set: Values** dialog box where you can group the customer numbers. Unfortunately, a visualization as a tree structure—as used for the creation of characteristics hierarchies for costing-based Profitability Analysis—isn’t possible. In the **From Value** and **To Value** columns, you can specify the intervals or individual values that belong to a group. In the **Short Text of Set Line**, you define the names of the hierarchy nodes. As you can see in Figure 5.18, you create hierarchy nodes **Gym** and **Retail**, similar to the hierarchy nodes in the characteristics hierarchy.

After you’ve confirmed your entries with Enter, the Create Report: Header screen opens where you can define the description and layout of the report and assign it to an authorization group. In the Create Report: Header screen, you can use the **Columns** button to navigate to the Create Report: Columns screen (see Figure 5.19).

**Figure 5.18** Creating Hierarchy Nodes in the Set

After the set has been saved, it’s available in Report Writer reports. To create Report Writer reports, call Transaction GR31 or follow the Accounting • Financial Accounting • Special Ledgers • Tools • Report Painter • Report Writer • Reports • Create Customizing path. In Create Report: Initial Screen, select a library, and enter a short description for the report. The library defines which characteristics and key figures are available in the report. Each reports needs to have a reference to a library.

**Figure 5.19** Assigning the “Customer Hierarchy” Set to a Report

In the **Column block** column, you can specify the previously created set, **Customer Hierarchy**. When you double-click on the set name, the system opens the Column Characteristic dialog box where you can define the settings for the layout of the set. You can use the **Set** button in the Column Characteristic dialog box to display the set, including the assigned characteristics. For this purpose, the **Display Set** dialog box (see Figure 5.19) opens at the bottom.
You can now use the Customer Hierarchy set in financial accounting and account-based Profitability Analysis reports.

Grouping Characteristics in Profitability Analysis
In costing-based and account-based Profitability Analysis, you can group characteristics. In costing-based Profitability Analysis, you create characteristics hierarchies in Customizing and assign them to reports. In account-based Profitability Analysis and financial accounting, you create sets and assign them to reports.

5.1.3 Automatic Characteristic Derivation for Internal Orders
Central entry aids facilitate the entry of characteristic derivations in settlement rules for internal orders in costing-based and account-based Profitability Analysis. You can also define mandatory fields for characteristic derivations in settlement rules to ensure that all required characteristics are transferred to Profitability Analysis.

Call Transaction KEPA or use the following Customizing path to create a characteristic group as the basis for the entry aid:
Controlling area
Profitability Analysis
Flows of Actual Values
Initial Steps
Characteristic Groups
Maintain Characteristic Groups.

Creating characteristic groups
You maintain the characteristic group on the basis of the operating concern. Click on New Entries to create a new characteristic group. In the Characteristic Group column, specify a key and name for your characteristic group, and navigate to the Characteristics folder on the left. In the Change View “Char. Groups for Actual and Planning”: Overview screen, click on New Entries to maintain all characteristics that will be displayed in the entry aid in the Field Name column (see Figure 5.20). You can use the F4 help to display a selection of the records that permit the use of central entry aids.

Defining the entry status
In the Entry Status field, you can define whether the entry aid displays the fields as Ready for input, Not ready for input, or Required entry. Save your settings using the Save button. In our example, characteristic group IA is created. The following characteristics were assigned as required fields to this group:

- Controlling area
- Company code
- Plant
- Material group
- Product

You can only save the internal order with the settlement rule in the operating profit if a characteristic value is maintained in the characteristics just mentioned.

Figure 5.20 Creating the Characteristic Group and Definition of the Characteristics

After creating your characteristic group, call Transaction KE4G or use the following Customizing path to assign the characteristic group to a record:
Controlling area
Profitability Analysis
Flows of Actual Values
Initial Steps
Characteristic Groups
Assign Characteristic Groups for Account Assignment Screen.

You assign characteristic groups to records on the basis of the operating concern. You can use New Entries to assign characteristics to the account assignment screen. In the Trans column, you can use the F4 help to display a selection of the records that permit the use of central entry aids.

In the example in Figure 5.21, you create an entry aid for the previously created characteristic group (IA) and record KABK (SETTLEMENT ACCOUNT ASSIGNMENT). This means that you have to maintain characteristic values for internal orders according to the previously created characteristic group if a settlement rule has been created.
If you click on (Entry Aid) in the Entry Aid column, a new window opens: Assignment to a Profitability Segment. It lists the characteristics you assigned to the characteristic group in the first step. You can specify default values respectively.

Preallocating characteristics

This example uses the following characteristics: Company Code, Plant, Product, and Material Group; you now enter default values in the corresponding fields and save them by clicking on (Save New Entry Aid) on the left of the screen.

Saving entry aids

The Save Entry Aid window opens in which you can enter a name for the entry aid. As illustrated in Figure 5.21, enter “ZRD2” in the Name field. This is an internal order type for which the characteristic values will be maintained specifically. Confirm your entries with [Enter], and save your settings by clicking on (Save).

Figure 5.21 Assigning a Characteristic Group to a Record

The entry aid is now available in transactions in which settlement account assignments can be made, for example, in Transaction KO01 to create internal orders. Call the required transaction via the following menu path in the application menu:

Accounting • Controlling • Internal Orders • Master Data • Specific Functions • Orders • Create.

The Settlement Rule button takes you to the maintenance of settlement rules. Here, enter “PSG” (profitability segment) into the Cat (category) field. The system displays the Assignment to a Profitability Segment screen.

In the screen shown in Figure 5.22, you can see the characteristics that are assigned to the characteristic group and require an entry because they are mandatory fields.

Figure 5.22 Maintaining the Characteristic Derivation in the Internal Order

Entry aids facilitate the maintenance of the assignments to profitability segments and define which characteristics have to be maintained by the user.

Entry Aids

Entry aids ensure that the documents contain all characteristics that are required for reporting when internal orders are settled. You define critical characteristics as required fields in a central entry aid. You can define various entry aids for each internal order type.
5.1.4 Generating Settlement Rules Automatically

To facilitate and accelerate month-end closings, you can generate settlement rules automatically, for example, in internal orders. This way, you don’t have to maintain settlement rules manually at a later stage.

SAP already provides some strategies for the automatic generation of settlement rules by default. The strategy defines the settlement receivers that can be generated for the settlement rule. If the provided strategies don’t meet your requirements, you can create your own strategies for the automatic generation of settlement rules. However, you require a developer key for this purpose.

You can also use the following Customizing path to display the SAP strategies for the automatic generation of settlement rules:

Controlling \ Internal Orders \ Actual Postings \ Settlement \ Automatic Generation of Settlement Rules \ Display Strategies for Automatic Generation of Settlement Rules.

The respective screen (see Figure 5.23) provides an overview of the SAP strategies for the automatic generation of settlement rules. However, you can’t create new strategies here but rather display existing strategies. Using Tools \ Operating Instructions in the menu bar, you can obtain further information on the strategies.

Figure 5.23  Displaying Strategies for the Automatic Generation of Settlement Rules

You can use the Customizing menu item described next to display the strategy sequences for the automatic generation of settlement rules, change them, or create new strategy sequences.

The strategy sequence determines which strategy is used for the generation of settlement rules. For this purpose, call the following Customizing path:

Controlling \ Internal Orders \ Actual Postings \ Settlement \ Automatic Generation of Settlement Rules \ Display Strategy Sequences for Automatic Generation of Settlement Rules.

The system now provides an overview of the existing strategy sequences. To view the details of the individual strategy sequences, select them, and then navigate to the Strategies folder on the left. A new window opens. Later, the strategy sequences are assigned to an order type, which activates the automatic generation of settlement rules for this order type.

You can create new strategy sequences by clicking on the New Entries button. Then, a window to create a strategy sequence opens that contains the Overview: Change Strategy Sequence table. Enter a key in the Strat field and enter a description for the new strategy sequence in the Description field.

In addition, you can define a settlement profile in the SettProf column, which is then copied as the default value to the internal order. If you don’t specify any settlement profile, the system uses the settlement profile from the internal order. Next, create the strategy sequence by navigating to the Strategies folder on the left.

As illustrated in Figure 5.24, you create a new strategy sequence, Z100 (strategy sequence ZRD2), for the automatic generation of settlement rules for internal orders of order type ZRD2.

Figure 5.24  Creating the Strategy Sequence for Internal Order Type ZRD2
Assigning strategies

Now, you can click again on New Entries to assign strategies to the strategy sequence. In the Prior column, you define the priority of the entry. The priority determines the processing sequence of the strategy sequence. If a strategy has been successful, strategies with a lower priority won’t be executed. In the next column, Strategy, you specify the strategy that defines which receiver is determined from the master data of the internal order for the settlement rule. In the last two columns, Percent and Set, you finally enter with which percentage the settlement is performed to the receiver and the settlement type to be used, respectively. In this example, you define that internal orders of order type ZRD are settled with 50% to the profitability segment and with 50% to the requesting cost center. Because the settlement is supposed to be performed with 50% to each receiver, you specify priority 1 for both lines. Accordingly, the two lines are always applied together. For the settlement to the cost center, it’s critical that the requesting cost center is defined in the master of the internal order; otherwise, the settlement rule can’t be generated automatically. Save your settings using (Save).

Assignment to order types

After maintaining the strategy sequence, you can assign it to an order type. For this purpose, call the following Customizing path: Controlling • Internal Orders • Actual Postings • Settlement • Automatic Generation of Settlement Rules • Assign Strategy Sequences to Order Type.

The order types are displayed to which a strategy sequence has already been assigned. You can assign new order types to strategy sequences by clicking on the New Entries button.

In the Modifiable column, you also can define the change behavior of settlement rules after a change of the master data. The following entries are available for selection:

- Do not overwrite
  The system doesn’t overwrite automatically generated settlement rules.

- Only overwrite unused rules
  The system only overwrites automatically generated settlement rules if they have not been used for settlement yet.

- Always overwrite
  The system always overwrites automatically generated settlement rules. If they have already been used for settlement, the validity of the original settlement rule is adapted.

Change behavior of settlement rules

In the last column, Status, you define with which status the settlement rule is generated automatically. The following statuses are available for selection:

- Created
- Released
- Technically completed

As illustrated in Figure 5.25, maintain an entry for order type ZRD2, which you assign to the previously created strategy sequence, Z100. In the Modifiable column, you define that the settlement rule may only be changed manually if it hasn’t been used for settlement yet. In the Status column, you specify that the settlement rule is derived if the internal order has the Created status. Save your settings using (Save).

Figure 5.25 Assigning a Strategy Sequence to the Order Type

Generating settlement rules

After the strategy sequence has been assigned to an order type, the system automatically generates the settlement rule according to the status. Call Transaction KO01 or follow the Accounting • Controlling • Internal Orders • Master Data • Special Functions • Orders • Create Customizing path. As illustrated in Figure 5.26, create an internal order with order type ZRD2. When you click on Settlement Rule, the system derives the following distribution rules according to the strategy sequence.

Figure 5.26 Generating a Settlement Rule Automatically
The automatic generation of settlement rules facilitates the creation of master data for your colleagues and ensures smooth month-end closing processes. Note that the automatic generation of settlement rules doesn’t function properly if a settlement rule has already been maintained manually.

### Automatic Generation of Settlement Rules

The automatic generation of settlement rules can be used in both account-based and costing-based Profitability Analysis. It ensures the correct assignment of internal orders and reduces the manual effort as well as the error rate for the creation of master data.

#### 5.1.5 Derivation Analysis

After creating characteristic derivations, moves, and table lookups, you can test them. To do so, call Transaction KEDR or follow the **Controlling • Profitability Analysis • Master Data • Define Characteristic Derivation** Customizing path.

**In the Characteristic Derivation: Display Strategy** screen, you can use the **Test** button to test the derivations in the system (see Figure 5.27). The **Test: Characteristic Derivation** dialog box opens in which you should enter the source characteristics that are required to derive the target characteristics. When you click on **Derivation**, the system derives all characteristics from the entered source characteristics.

If you don’t understand the derived results or if you want to analyze the results in detail, you can click on **Analyze derivation** to display the details of the derivation. Figure 5.28 shows the derivation steps the system has performed. You can expand the individual steps to view the source fields that were used to determine the target fields. Regardless of the derivation of the country of the ship-to party, you can see that ship-to party 1 had been found from whose master country US was derived.

The analysis of the characteristic derivation is ideal to test previously created characteristic derivations or analyze characteristic derivations to better understand the results.
5.2 Transferring Costings to Profitability Analysis

The settings described in this chapter only refer to costing-based Profitability Analysis and can’t be applied to account-based Profitability Analysis. This section explains how to transfer costings to costing-based Profitability Analysis and use various costing variants for valuations in costing-based Profitability Analysis.

If you want to valuate your sales quantities using several costing variants, you have to implement costing variant Profitability Analysis because account-based Profitability Analysis only permits valuations with the valuation price that is valid when the goods are issued.

5.2.1 Defining Valuation Strategies

Defining a valuation strategy plays a major role for the definition of valuations with several costing variants in costing-based Profitability Analysis.

To define valuation strategies, call Transaction KE4U or follow the Controlling • Profitability Analysis • Master Data • Valuation • Valuation Strategies • Define and Assign Valuation Strategies Customizing path.

You can use New Entries to create new valuation strategies. As illustrated in Figure 5.29, you create valuation strategy 001 for the actual valuation in the Change View “Valuation strategy”: Overview screen.

After creating the valuation strategy, select it, and then navigate to the Details folder in the Dialog Structure section on the left. The Change View “Details”: Overview screen opens. You can define various valuation strategies. The SAP system allows for the following valuations by default:

- **Valuation using Profitability Analysis conditions**
  The valuation is performed using conditions of an SAP ERP SD costing sheet. Each condition is assigned to a value field here.

- **Valuation using material cost estimates**
  One or several material cost estimates are used to valuate the sales quantity. This scenario is used most often to valuate sales quantities in costing-based Profitability Analysis and will be described in detail in this section.

- **Valuation using user-defined valuation routines**
  A user exit is available that can be used to program the valuation according to user-defined/customer-specific requirements.

- **Valuation using transfer prices**
  In planning, you can valuate sales quantities using transfer prices; however, this scenario can’t be used for actual valuations.

Figure 5.30 shows the required settings to enable valuations of sales quantities using material cost estimates in costing-based Profitability Analysis.

Set the checkmark in the Mat. cstg (material costing) column, and enter the value field in which the sales quantities is updated in the Qty Field column.

In our example, this is value field “ABSMG” (Sales Quantity).

Then, navigate to the Assignment of valuation strategy folder in the Dialog Structure section on the left.
Assignment of the reference time

Here, you can assign the previously created valuation strategy to a reference time. The following reference times are available for selection:

- **01 (Real-time valuation of actual data)**
  The material cost estimate data is derived in real time when the actual data is created, for example, when billing documents are transferred.

- **02 (Periodic valuation of actual data)**
  The material cost estimate data is derived during the revaluation process, for example, at the end of the month when billing documents are revaluated using Transaction KE27.

- **03 (Manual planning)**
  The material cost estimate data is derived when the planning process is executed manually, for example, if you use Transaction KEPM for planning.

- **04 (Automatic planning)**
  The material cost estimate data is derived when an automatic planning process is created, for example, if planning data is transferred from a predecessor module.

In the example in Figure 5.31, you determine that the material cost estimate data will be derived at the **01 (Real-time Valuation of Actual Data for Record Type F—Billing Document)** point of valuation.

![Change View "Assignment of valuation strategy": Overview](image)

Figure 5.31 Assigning the Valuation Strategy

After defining and assigning the valuation strategy, you create a costing key, which determines, for example, which costing variant is assigned to the valuation strategy.
The costing key screen contains the Additional CO-PA Data section at the bottom (see Figure 5.33). Here, you can choose from the following two options:

- **Exclusive access to cost estimate**
  If several cost estimates that will be used for valuation are defined in the costing key, the system doesn’t search for other valuations if this checkmark is set; instead, an exclusive valuation is performed using the cost estimate that is defined in the costing key. Consequently, you must not set the checkmark if you want to perform a valuation with various costing variants.

- **Error message if no cost estimate found**
  When transferring the billing document, the SAP system outputs an error message if no cost estimate can be found for any costing key at all. Because you want to ensure data consistency and use all costing variants for derivation, you set the checkmark for the error message.

Save the costing key using (Save).

![Change View “Costing Key”: Details](image)

**Figure 5.32 Creating the Costing Key**

**Maintaining costing keys**

The costing key screen contains the Additional CO-PA Data section at the bottom (see Figure 5.33). Here, you can choose from the following two options:

- **Exclusive access to cost estimate**
  If several cost estimates that will be used for valuation are defined in the costing key, the system doesn’t search for other valuations if this checkmark is set; instead, an exclusive valuation is performed using the cost estimate that is defined in the costing key. Consequently, you must not set the checkmark if you want to perform a valuation with various costing variants.

- **Error message if no cost estimate found**
  When transferring the billing document, the SAP system outputs an error message if no cost estimate is available for this costing key. The billing document can’t be transferred to Profitability Analysis and is stuck in the accounting interface. In the SAP standard, the system only outputs an error message if no cost estimate can be found for any costing key at all. Because you want to ensure data consistency and use all costing variants for derivation, you set the checkmark for the error message.

Save the costing key using (Save).

![Maintaining Additional Data for Profitability Analysis in the Costing Key](image)

**Figure 5.33 Maintaining Additional Data for Profitability Analysis in the Costing Key**

After defining the costing keys, you have to assign them so that they can be used for transferring the billing documents to Profitability Analysis. The SAP standard provides three assignment options for costing keys, which you can also combine. The costing keys are used in the sequence in which they are sorted in Customizing. This means that the costing key assignment for the products is used first, then the assignment for the material types is used, and finally the assignment of the costing keys to any characteristics is used. If you’ve maintained an assignment to an individual product, it’s transferred, and all other assignments are ignored.

The following sections introduce the individual assignment options. You define the assignment of costing keys for products using Transaction KE4H (this transaction is removed from the Customizing path in SAP S/4HANA Finance but can still be used).

In the Change View “Costing Key for Product”: Overview screen, you can click on New Entries to maintain assignments for individual products. This takes you to the New Entries: Overview of Added Entries screen. Select 01 as the point of valuation (PV column) for the actual data transfer. The entry in
the **Valid to** column defines up to which date the assignment for this product is valid (see Figure 5.34). You can only enter three costing keys (**C.key 1**, **C.key 2**, and **C.key 3**) in the assignment for products and material types. In flexible costing keys, on the other hand, you can assign up to six costing keys.

### Figure 5.34 Maintaining the Costing Key for Materials

The assignment of costing keys for material types is identical to the assignment of costing keys for products. Call Transaction KE4I (this transaction is also removed from the Customizing path in SAP S/4HANA Finance but can still be used).

In the **Change View** "Costing Key for Material Type": **Overview** screen, you can click on **New Entries** to maintain assignments for individual material types. This takes you to the **New Entries: Overview of Added Entries** screen (see Figure 5.35). The same conditions apply to the assignment of costing keys to material types and to the assignment of costing keys to products; the layout of the corresponding tables is also the same.

### Figure 5.35 Maintaining the Costing Key for Material Types

The assignment of costing keys to any characteristics, however, differs from the assignment to products and material types. To maintain flexible costing keys, use the following Customizing path or call Transaction KEPC:

### Figure 5.36 Defining Flexible Costing Keys

In the **Assign Costing Keys to Any Characteristics: Display Rule Definition** screen, you can click on **(Select)** to define the source fields for which the costing key will be assigned. Predefined fields are the point of valuation (**BWFKT**), record type (**VRGAR**), and plan version (**VERSI**); in addition, all characteristics assigned to the operating concern are available. You can define very differentiated assignment rules, but the less is more rule applies here because the costing key should still be clear and transparent.

Select the costing keys to be used for valuation as the target fields. If the checkmark for **Do Not Cost** is set in the material master in the **Costing 2** view for salable products, valuations with costing keys can’t be performed. For these materials, you have to transfer the value according to condition VPRS (Moving Average Price). Therefore, you must add the **VALUE_FLD1** (**CO-PA**: value field that is reset) field for all costed materials to the target fields (see Figure 5.36).
This avoids updating the moving average price in Profitability Analysis for costed materials and avoids transferring Costs of Goods Manufactured (COGM) twice.

When you click on Maintain Rule Values, a new window opens in which you can maintain the entries for the defined source and target fields. Enter when the valuation with the costing should be performed in the Point of Valuation column. In the example, select 01 (Realtime valuation of actual data); then, the sales quantity isvaluated using the defined costing keys when the billing document is transferred to SAP ERP Financials (SAP ERP FI) and Profitability Analysis. In the Record Type column, you select F (Billing Data) for the valuation of the billing documents. Leave the Plan Version (CO-PA) column empty to value actual data. In the First Costing Key column, enter the costing key that will be used for the valuation in Profitability Analysis (see Figure 5.37).

The assignment of the costing keys allows you to value sales in Profitability Analysis using various valuation approaches for COGM. For example, you can calculate the profit margins for the different valuation approaches and compare them.

**Valuation Using Material Cost Estimates**

The valuation of the sales quantities with up to six different costing variants can only be used in costing-based Profitability Analysis. By assigning a costing variant to a valuation strategy, you activate the valuation of sales quantities using material cost estimates.

Various options are available to assign costing keys. Which option you use depends on the complexity of your organizational structure and your product portfolio. For example, if you sell trading goods but don’t cost them, you can exclude the material type for trading goods from the valuation with costing variants in the costing key for material types. If you work with finished goods that you don’t cost because they are discontinued products, you can exclude them from the valuation with costing variants in the costing key for products. In real-world scenarios, the assignment of costing keys to any characteristics is mainly used because it allows you to reset the value field that is assigned to condition VPRS (Moving Average Price). If this value field is filled with a value during the transfer with a costing variant, COGM is transferred to Profitability Analysis twice, and the reconciliation with financial accounting becomes more complex.

Like in account-based Profitability Analysis, you can also assign cost items of the cost component structure to a separate value field in costing-based Profitability Analysis. To do so, call Transaction KE4R or follow the Controlling • Profitability Analysis • Master Data • Valuation • Set up Valuation Using Material Cost Estimates • Assign Value Fields Customizing path. You assign the cost items to the value fields separately for each operating concern and cost component structure. As you can see in Figure 5.38, the Work Area is restricted to Operating concern EVOL and Cost component structure 01. Press Enter to confirm your entries.

When you’ve confirmed your entries, the New Entries: Overview of Added Entries screen opens. In the PV (point of valuation) column, you specify the time for the derivation of the material cost estimate values.

The points of valuation here are the same as the points of valuation for costing keys. Point of valuation 01 here also refers to the real-time valuation of
actual data. In the CC (cost component) column, you enter all cost items of the cost component structure. Make sure that the data you provide is complete; otherwise, the respective cost items won’t be transferred to Profitability Analysis. If you don’t assign a cost item that contains values in the material cost estimate to a value field, these values won’t be transferred to costing-based Profitability Analysis, and the values for the Cost Of Goods Sold (COGS) won’t be correct.

In the F/V (fixed/variable indicator) column, you specify which cost item will be transferred to the value field in the Fld Name 1 column. You can transfer the following amounts:
- 1 (fixed amounts)
- 2 (variable amounts)
- 3 (totals of fixed and variable amounts)

Make sure that you maintain two entries for cost items containing fixed and variable amounts if you want to differentiate between fixed and variable amounts.

If you use various costing variants, you have to maintain different value fields for them in the Fld name 2 and Fld name 3 columns. This is necessary, because the value fields will be overwritten otherwise.

Figure 5.39 Assigning Value Fields to Cost Items

Figure 5.40 Displaying the Profitability Analysis Document

If you now check the accounting document for the goods issue of the billing document in Figure 5.41, you can check the splitting into four cost items and confirm the value of USD 0.54 (considering rounding differences).

Figure 5.41 Displaying the Accounting Document for Goods Issues

Let’s now take a look at the material cost estimate according to the material master (see Figure 5.42); it confirms the price of USD 0.54 for one piece.

COGS Split
In account-based Profitability Analysis, you can split the goods issue for delivery into the cost items of the material cost estimate. In costing-based Profitability Analysis, you can also split the COGS into the cost items according to the cost component structure of the material cost estimate.
5.2.3 Billing Document Analysis/Reconciliation

The operating profit in costing-based Profitability Analysis often doesn’t correspond to the operating profit from SAP ERP FI. Transaction KEAT supports you in introducing costing-based Profitability Analysis to avoid differences during live operation. However, you not only can use this transaction for the implementation but also to analyze variances in month-end closings.

Enter transaction code “KEAT” or call the following entry in the menu:
Accounting • Controlling • Profitability Analysis • Tools • Analysis of Value Flows • Check Value Flow from Billing Document Transfer.

In the selection screen, you specify which data you want to analyze. As illustrated in Figure 5.43, you analyze the data of Company Code US10 in December 2016. The selected Currency type is 10, which corresponds to the company code currency. In the Selection of FI values or PCA values section, select the Display FI values checkmark, and click on (Execute) to start the analysis.

A new window opens. The following analysis results are listed for our example:

- **Revenue**
  - The CO-PA value, SD value, and FI value columns show the same amount (19,500.00). The Delta CO-PA/SD and Delta SD/FI columns show a delta of 0.00. Consequently, there are no revenue differences.
accounting. The SAP system always compares the COGS with the value of condition VPRS, which is included in the billing document.

- **Direct Mat. Costs** (direct material costs)

Here, the system compares the goods issue value posted using condition VPRS. Because you reset the value in value field VPRS to zero using flexible costing keys, Transaction KEAT outputs a difference between Profitability Analysis and SAP ERP SD because the values in SAP ERP SD already exist on condition VPRS but aren’t received in Profitability Analysis—or only distributed across the value fields of the cost split. The value of the value fields of the material cost estimate doesn’t match the difference because a Profitability Analysis document of USD 1.08 has been manually reversed in Profitability Analysis.

- **Goods Issue Not Billed**

This line lists the values of the material cost estimate that were assigned to the Other Overhead value field. There is no equivalent for this value because the cost splitting doesn’t have a value in financial accounting. The SAP system always compares the COGS with the value of condition VPRS, which is included in the billing document.

Analyzing differences

In Figure 5.44, you can expand the line with the differences. The system displays the General Ledger (G/L) account with the differences. Display the line item list of G/L account 510060 (Other Changes to Stock) in company code US10 for December.

In Figure 5.45, you can see a difference of USD 1.62 in the posting line with document numbers 4900000049 and 4900000050. USD 1.08 and USD 0.54 amount to the displayed difference of USD 1.62. The amount of USD 0.54 from document 4900000050 is mapped in the individual value fields in Transaction KEAT. The amount of USD 1.08 from document 4900000049 isn’t displayed in Transaction KEAT because this document has been manually reversed in costing-based Profitability Analysis.

**G/L Account Line Item Display**

Figure 5.45 Displaying the Financial Accounting Document

The transaction introduced here valuates the value flow from SAP ERP SD to SAP ERP FI and Profitability Analysis. This means that you can’t analyze all flows of goods but rather the values from the transfer of the billing documents because the reconciliation process in this area of costing-based Profitability Analysis is the most complex and less transparent process.
Value Flow Analysis
Transaction KEAT helps you analyze the value flows from SAP ERP SD to costing-based Profitability Analysis. When setting up costing-based Profitability Analysis, it’s critical to understand the value flows and configure them properly to minimize reconciliation issues with financial accounting.

5.3 Summary
This chapter described how to automate and analyze the derivation of characteristics. The first part of this chapter is relevant to account-based and costing-based Profitability Analysis.

In the second part, you learned how to valuate sales quantities in costing-based Profitability Analysis using various costing variants. This function is available in costing-based Profitability Analysis only.
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