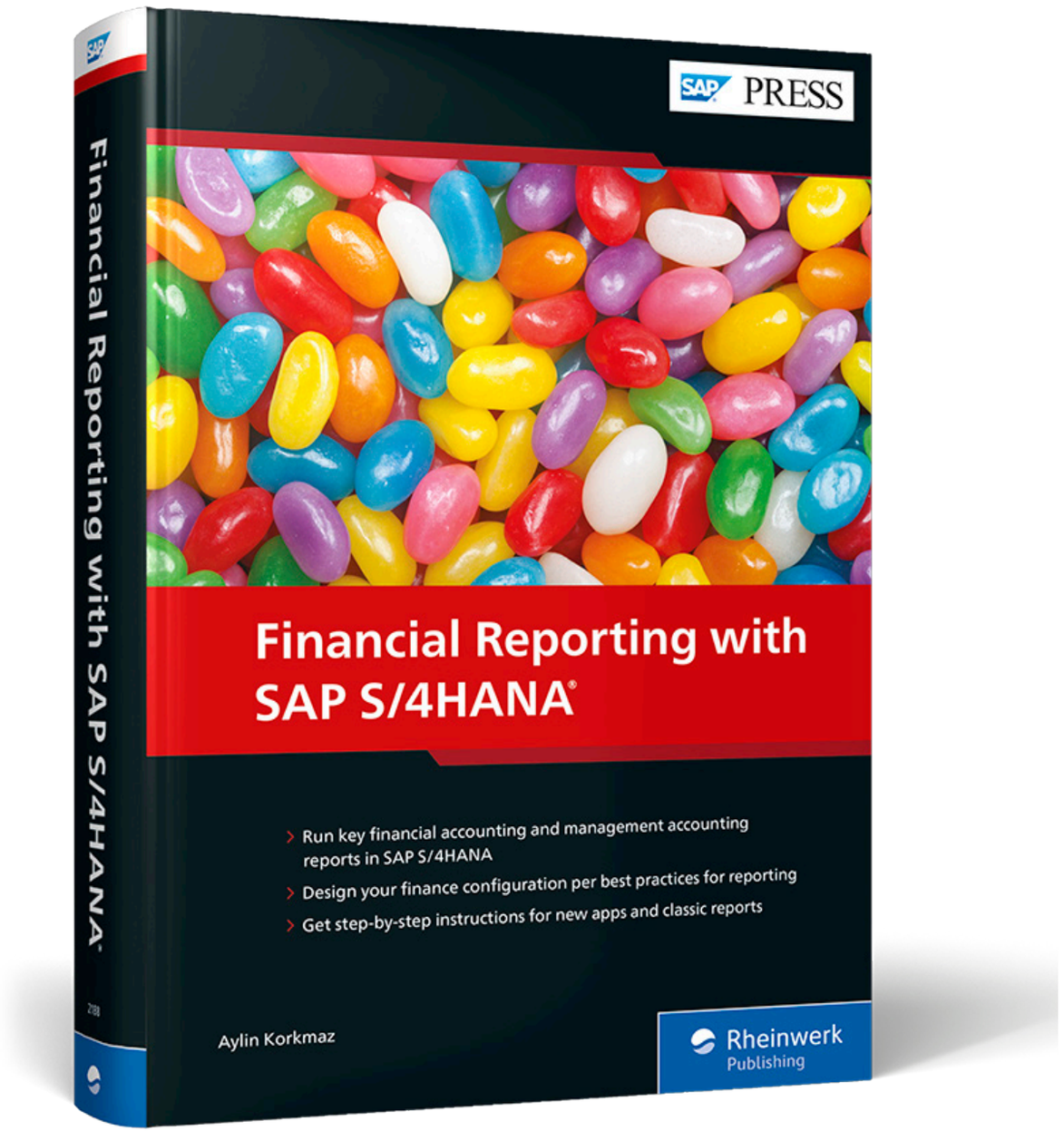

Browse the Book

This sample chapter describes how you can best design your segment reports by leveraging the latest capabilities of SAP S/4HANA. It covers both the key requirements as well as the main design considerations for segment reporting. It explains SAP S/4HANA analytical apps for segment reporting, with a focus on the Trial Balance and Financial Statements apps. It also covers the existing SAP GUI reports for segment reporting for those who prefer to continue to use SAP GUI.

"Segment Reporting"

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Chapter 3
Segment Reporting

The emphasis in this chapter is on recommending the leading foundations of segment reporting design. In addition, we explain the key analytics apps in SAP S/4HANA to comply with segment reporting requirements. We'll also cover the key SAP GUI reports for segment reporting.

One of the requirements of International Financial Reporting Standards (IFRS) is to provide financial information by operating segments, products and services, geographical areas, and major customers, which is known as *IFRS 8 Operating Segments*. This compliance applies to companies whose equity and debt securities are publicly traded and to enterprises in the process of filing their consolidated financial statements with a securities commission or other regulatory organization to issue any class of instruments in a public market.

For the U.S. Generally Accepted Accounting Principles (U.S. GAAP) accounting standard, segment reporting requirements are included in the Financial Accounting Standards Board (FASB) *Accounting Standards Codification (ASC) Topic 280*. The segment reporting requirements in FASB are very similar to IFRS 8.

According to IFRS, an *operating segment* is defined as a component of an entity that engages in business activity that may earn revenues or incur expenses, whose operating results are regularly reviewed by the chief operating decision maker, and for which discrete financial information is available. In other words, operating segments are based on information that management uses for the financial results. It's important that you first define the segments according to compliance requirements.

The purpose of this chapter is to explain the segment reporting solutions and advise you on how you can best design your segment reports by leveraging the latest capabilities of SAP S/4HANA. To do this, we'll first walk through the segment reporting solutions and show how to leverage the SAP S/4HANA capabilities; from there, we'll cover the main design considerations for segment reporting and explain key SAP S/4HANA analytical apps for segment reporting, with a focus on the Trial Balance and Financial Statements apps. We'll also cover the SAP GUI reports for segment reporting for those who prefer to continue to use SAP GUI.

3.1 Segment Reporting Requirements

Segment reports prepared for the board of directors, CFO, and CEO should typically determine segments for external financial reporting purposes. It's important that you first define the segments according to compliance requirements. You can use the following criteria to define your segments according to IFRS. A segment is a reportable object if most of its revenue is earned from sales to external customers and if the following are true about the segment:

- Revenue from sales to external customers and from transactions with other segments is at least 10% of total sales.
- Segment profit and loss (P&L) numbers are at least 10% of the total P&L.
- Assets are at least 10% of the total assets of all operating segments.

In addition, it's important to note that if the total revenue of reportable segments is less than 75% of the total consolidated revenue, additional reportable segments must be added until the threshold is reached.

There were various complex options available for segment reporting before SAP introduced the *segment* object and segment reporting features with SAP ERP. The segment reporting capabilities are further enhanced with the unified data reporting structure of the Universal Journal, analytics reports, and reorganization capabilities in SAP S/4HANA. Segment object information is captured and stored in each data record, enabling segment-based financial statements to be available within standard apps in the general ledger, saving time, and minimizing errors. You can review account balances at the segment level and easily handle periodic activities (e.g., revaluation and balance carryforward). By using these new functionalities, organizations no longer have to wait until period-end close to build their segment reporting, which is an error-prone and expensive approach. That said, many SAP customers have already implemented their SAP system and want to understand how they can improve their segment reporting in line with the strategic direction of SAP S/4HANA.

In the next section, we look at the design considerations and explain the best practices to simplify and streamline segment reporting. Reviewing the different segment reporting solutions and recommended best practices in this section is crucial to generating segment reporting accurately for your organization.

3.2 Designing for Segment Reporting

Evaluating the range of options that are available for segment reporting in SAP ERP was complex, primarily due to the multitude of possible implementation solutions. SAP S/4HANA provides a better way of modeling options for segment reporting compliance. The reporting capabilities of SAP S/4HANA are based on the unified data reporting structure. You can capture segment details in each data record. Because segment

information is stored at the detailed document level, segment-based financial statements are available within standard reporting in the general ledger, saving time and minimizing errors. You can review account balances at the segment level and handle periodic activities (e.g., revaluation and balance carryforward) easily.

You can consider many leading design practices when evaluating segment reporting solutions and approaches. In this section, we specifically discuss the following leading design practices and share our experience:

- Determining the right segment reporting solution
- Splitting and having balanced books on segment reporting objects
- Ensuring that all transactions are updated with segment information
- Using universal allocations
- Rationalizing the number of profit centers

Let's first discuss reporting solutions and approaches so you can determine the best one to meet your segment reporting requirements, which will in turn influence the design of business processes.

3.2.1 Determining the Right Segment Reporting Solution

In the previous releases of SAP ERP, SAP provided several reporting solutions to meet segment reporting compliance. The main applications of these solutions were as follows:

- Business Area Accounting (FI-BA)
- Profit Center Accounting (EC-PCA)
- Special Purpose Ledger (FI-SL)
- SAP General Ledger

There were similarities and differences between the core functionalities of each of these solutions, and there were variations in how these solutions could be implemented in the system. The solutions themselves vary in terms of the level of customization involved, requirements met, and desired capabilities delivered. In addition to these reporting solutions, many reporting objects were available in financial and management accounting. Some of these reporting objects were relevant to only financial accounting, some of them were relevant to only management accounting, and some of them were relevant to both.

With SAP S/4HANA, SAP completely re-architected its inner structure and data modeling so that all the segment reporting objects are updated in a single record in the Universal Journal. You're able to generate your segmented financial statement reports from general ledger accounting.

Figure 3.1 shows the main reporting objects available in SAP S/4HANA. SAP S/4HANA provides a balanced books capability only for dimensions such as the business area, profit center, segment, customer fields, and industry-specific fields (e.g., fund and grant). This means you can generate your segment reporting only for those dimensions. Perhaps the most important question is which reporting solution and dimension is best to

use for segment reporting. In this section, we explain and evaluate each of the segment reporting objects in conjunction with the reporting solution to guide you in determining the right solution for your organization. We'll also cover new reorganization functionality in SAP S/4HANA for segment reporting.

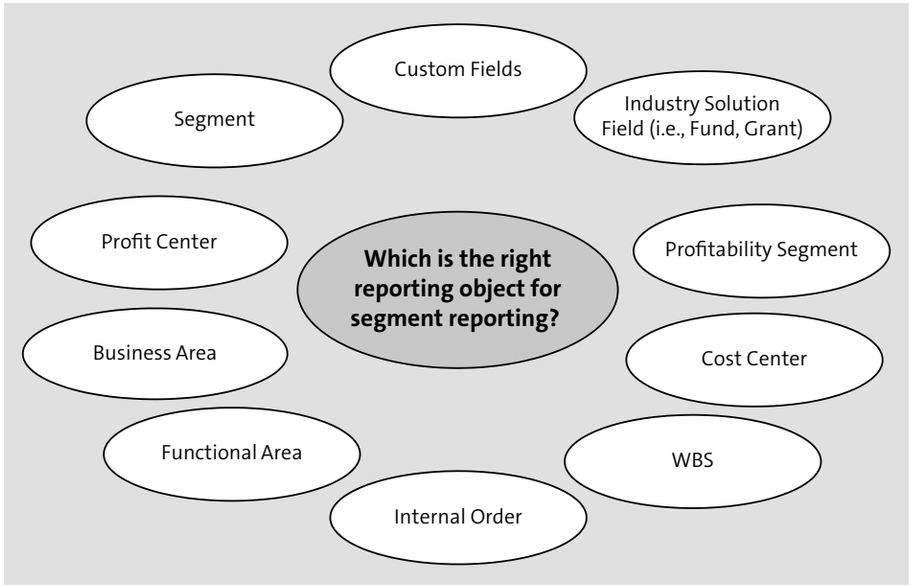


Figure 3.1 Main Reporting Dimensions in SAP S/4HANA

We first look at business area and profit center reporting objects, which were available in SAP ERP. After that, we examine the new reporting object segment and other segment reporting dimensions fields (e.g., custom fields and industry-specific fields) integrated with SAP General Ledger in SAP S/4HANA to explain the best possible usage of these reporting objects in SAP S/4HANA.

Business Area

Traditionally, the business area has been available as a segment reporting object for a long time, but it's not supported in SAP S/4HANA. In SAP ERP, Business Area Accounting (FI-BA) operated within SAP ERP Financials and was integrated with the logistics and management accounting components. You were able to define business areas according to different segment areas (e.g., product lines, geographical areas, management areas). The business area definition wasn't dependent on any structure or relationship of company codes or controlling areas. They were defined within one client and could be used across all company codes within that client.

Some SAP customers with older versions of SAP still use business areas for their reporting. If you're an existing customer using business areas for segment reporting, the business area object is still supported in the on-premise version of SAP S/4HANA for

migration customers for compatibility reasons. If you're performing a greenfield on-premise SAP S/4HANA implementation, we recommend using profit center or segment entities instead of business areas as SAP won't make any innovations for business areas. Note that the business area object isn't supported in SAP S/4HANA Cloud (see SAP Note 2760863).

Business Areas and Central Finance

For customers using business areas who want to implement Central Finance, SAP has provided a standard business add-in (BAdI) in Central Finance that can replace business areas with profit centers. If you're using business areas in your existing SAP R/3 or SAP ERP system and implementing Central Finance, you can replace business areas with profit centers or segments by tweaking mappings via BAdI `BADI_FINS_CFIN_MAPPING`.

Now that we've explained the direction for the business area reporting object, let's review profit centers and discuss the leading practices for using the profit center as a reporting object for segment reporting.

Profit Center

The profit center has also been available as a reporting object for a long time and can be defined similarly to business areas; that is, it's possible to define and create reporting structures based on product lines, geography, a combination of these, or management areas. Profit centers are created within a controlling area and are therefore dependent on the assignment of company codes to a controlling area. They are then available across all company codes for the assigned controlling area and can be used by company codes within the controlling area in the postings.

With profit centers, it's possible to create hierarchal structures as groups of profit centers and then to use these hierarchies within reporting. Profit centers are assigned to all controlling objects relevant for revenue and expense postings (cost centers, orders, work breakdown structure [WBS] elements, etc.). As a result of these assignments, any postings to the assigned objects are then automatically updated with the corresponding profit center. For example, each cost center has a profit center field on its master record, and, as a result, any postings to that cost center also appear in the assigned profit center. Additionally, profit centers are assigned to materials to capture postings related to material movements, such as a change in stock, goods receipts, and good issues.

In SAP ERP, EC-PCA had to be activated to use the profit center as a reporting object. Unlike FI-BA, EC-PCA fell neither within the Financial Accounting (FI) component nor within the Controlling (CO) component but was cross-functional, mirroring the transactions of both. PCA achieved this by lying within the separate Enterprise Controlling (EC) component, with each EC-PCA posting being a separate and parallel posting to the FI and CO postings.

EC-PCA offered many advanced functionalities needed for segment reporting. For example, it provided substitution tools to create rules for more complex assignments as well as postings via assignments of other objects. In addition, certain allocation techniques were available that allow the creation of EC-PCA–only allocations or postings that don't affect other ledgers. Another feature of EC-PCA that was important for segment reporting was that it recognized CO transactions. Therefore, reports generated from EC-PCA included all accounts within the chart of accounts and secondary cost elements. EC-PCA also allowed the analysis of statistical key figures by profit center. (Statistical key figures are defined to capture measures such as number of employees, square meters, etc., and can be used in allocations and reporting.) Consequently, it was possible to calculate key performance indicators (KPIs) such as return on investment, cash flow, sales per employee, and so on. Because of all these advanced functionalities, EC-PCA was the preferred solution compared to the FI-BA solution. However, if you used EC-PCA for segment reporting, you know that problems usually arose with balance sheet accounts. Balance sheet accounts were transferred to EC-PCA at period end. Although you would transfer them as a period-end closing task, it was difficult to transfer some balance sheet accounts accurately.

SAP kept EC-PCA in SAP ERP but enhanced the integration with the general ledger, so you no longer needed to use the EC-PCA component to report on the profit center; instead, you needed to activate the profit center as a main prerequisite. With the adoption of PCA functionalities, profit center and partner profit center became characteristics in the new general ledger. With SAP S/4HANA, SAP enhanced the new general ledger and completely rebuilt its inner architecture and database structure. It includes all relevant segment reporting dimensions such as profit center, partner profit center, general ledger account, and so on in the single Universal Journal table mentioned previously. Thus, profit center details are updated in the financial transactions simultaneously, which gives you the ability to get profit center–based financial statements from the Universal Journal. The data isn't updated in other tables as in the EC-PCA. The Universal Journal provides one-stop integrated reconciliation of ledgers.

Classic Profit Center Accounting in SAP S/4HANA

One of the questions we often hear from existing customers who used EC-PCA is whether they can continue to use it in parallel with profit center accounting in the Universal Journal. The answer is yes if this is an interim solution. It's technically possible to use Profit Center Accounting with the Universal Journal. However, we don't recommend you do this long term due to increased data volume and the time and effort required for the reconciliation of these two applications. Furthermore, Classic Profit Center Accounting (PCA) is part of the SAP S/4HANA compatibility scope and comes with limited usage rights. You need to migrate from Classic PCA to its designated alternative functionality profit center accounting on the Universal Journal in SAP S/4HANA before the expiration of the compatibility pack license. You can find details on the compatibility scope and its expiry date, as well as links to further information, in SAP Note 226932.

As we mentioned before, you can also use the segment as a reporting object, which is explained next.

Segment

As the name suggests, the segment reporting object is introduced for segment reporting compliance. Segments aren't dependent on any structure or relationship of company codes or controlling areas. Like business areas, they are defined in one client and can be used across all company codes within that client. Unlike profit centers, it's not possible to create hierarchical structures as groups of segments and then use these hierarchies in standard reports.

To post, analyze, and display segments in the general ledger reports, you need to derive them in the financial transactions. Segments can be derived from profit centers via a BAdI or defaulted to a constant value. Figure 3.2 shows a schematic view of segment derivation. You can assign segments to relevant profit centers. As a result of these assignments, any postings to the profit centers are then automatically updated in the corresponding segment. Postings without profit centers can be updated by either using a BAdI (`FAGL_DERIVE_SEGMENT`) or defaulting to a constant value.

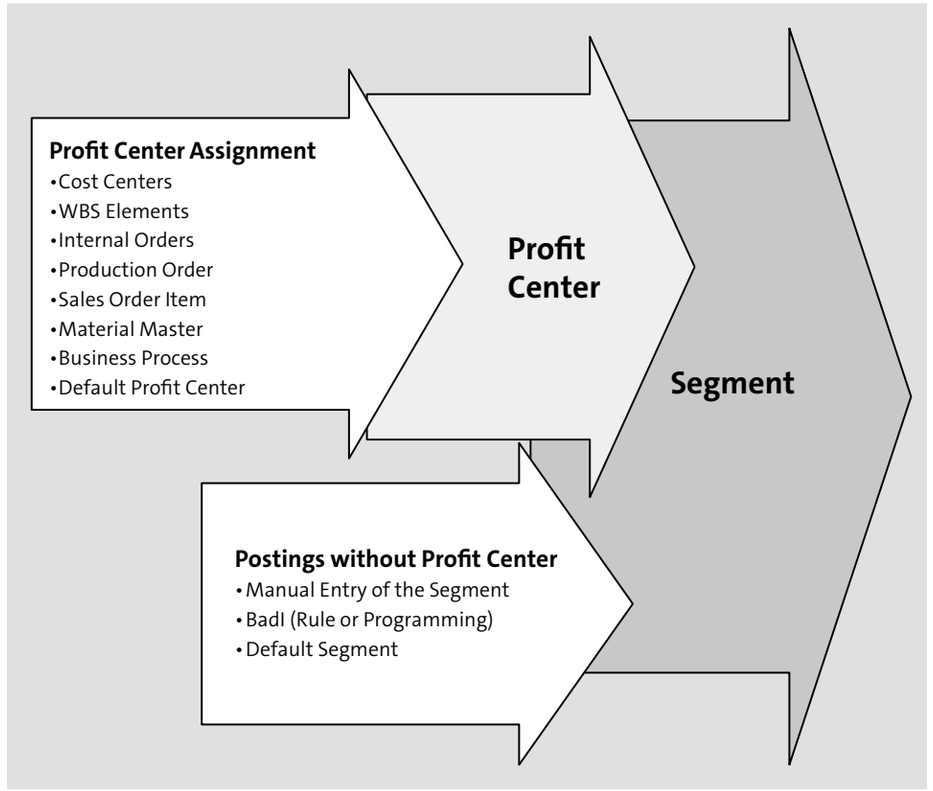


Figure 3.2 Schematic View of Segment Derivation

In addition, segment information can be manually populated at the time of posting. We recommend that such manual updates be carefully controlled to avoid any mistakes.

With SAP S/4HANA, profit center master data is managed via the Manage Profit Center app, and segments can be created at the backend via Transaction S_ALO_19000003. Figure 3.3 shows an example of how you can assign segment information in the profit center master data via the Manage Profit Center app. In this example, **Profit Center YB110** is assigned to **Segment 1000_A**.

When creating a new profit center, you must assign a segment to the profit center. It's possible to change the segment field assignment in the single master data change transaction if profit center postings haven't yet been made. This ensures consistent balance at the segment level, as any change in segment assignment in the profit center master data will lead to misstatements in segment reporting.

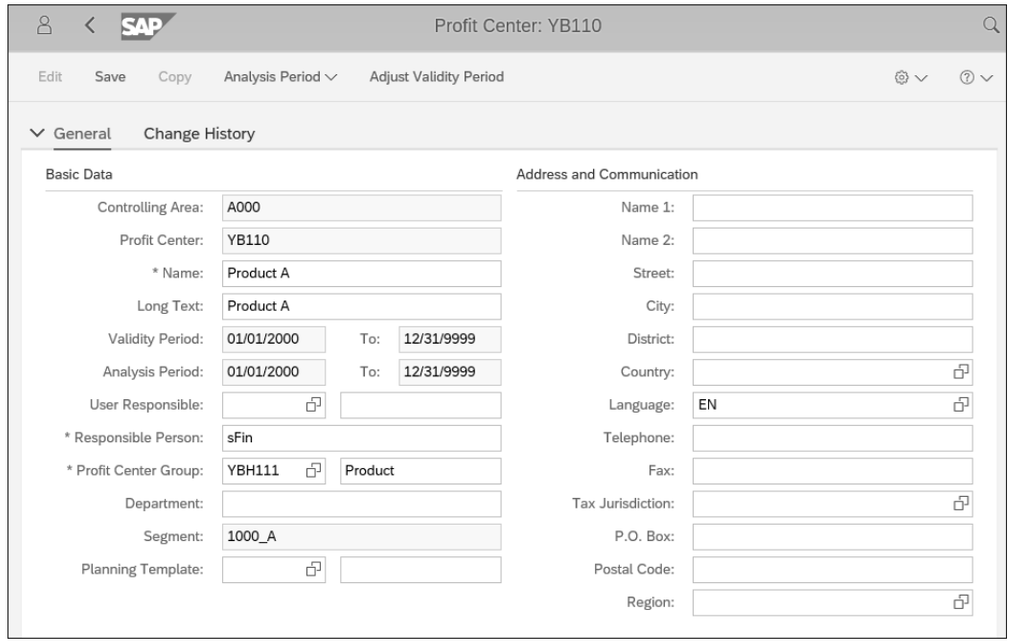


Figure 3.3 Segment Assignment to Profit Center Master Data

Reorganization

Because segment dimensions (e.g., segment, profit center) are updated at the document level, any changes to the segment information should be performed via document corrections. Enterprises sometimes have to make changes to the reporting segments, for example, removing one operating segment and replacing it with another in the middle of the fiscal year, which requires them to report the whole fiscal year and the previous year's results with the new segment reporting structure. With SAP S/4HANA, SAP introduced *reorganization* functionality, which can be used to change assignments of the segment reporting dimensions.

Note

Reporting hierarchies for profit centers can be used to quickly reflect organizational changes. The changes can be implemented swiftly and efficiently using *flexible hierarchies*. Flexible hierarchies work with tags and attributes. They are managed via the Maintain Flexible Hierarchies app (app ID F2759). Flexible hierarchies can be used to create company codes, profit centers, and cost centers.

Custom Field

Custom fields can be added to the coding block of the general ledger and used as reporting objects. SAP S/4HANA allows the addition of custom fields to the code block of the general ledger as in the previous releases. Once added, these fields behave like other account assignment fields. Although the customer field approach can provide segmented financial statements, deriving and populating the customer fields in financial transactions is difficult. Therefore, the custom field approach isn't a practical reporting solution for meeting segment reporting requirements. We recommend not using custom fields before fully exploring the standard reporting objects (segment and profit center).

Industry Solution Field

SAP introduced industry solution fields to get full financial statements, starting with SAP ERP. For example, you can get financial statements at the grant and fund level for the Public Sector solution. You can continue to use industry solution fields in SAP S/4HANA to meet your industry-specific requirements.

In addition to the reporting objects we've discussed, some organizations use the company code approach for their segment reporting. We don't recommend using this approach unless it has already been implemented. We explain the company code approach in the following note.

Company Code Approach

The company code is the smallest organizational unit within SAP for which a complete self-contained set of accounts can be created for external reporting. Frequently, the principle is to use one company code per legal entity. To support segment reporting requirements, some implementations have broken this principle and created separate company codes for each reporting unit and then consolidated this information for legal entity reporting. Although in this manner a company code approach would provide full financial information by reporting unit, the sharing of facilities between company codes could be difficult. For example, items such as customers, plants, sales organizations, cost centers, and so on are either directly or indirectly assigned to company codes and, as a result, would necessitate multiple assignments per legal entity for each

reporting unit. This would complicate financial transactions and system management where objects are shared across reporting units. This approach would also complicate business processes such as period-end closing, where multiple period-end closes would be required for each reporting unit. In addition, using the company code approach for purposes other than its original intention results in little flexibility for future changes and could lead to many unanticipated problems. We don't recommend using this approach unless it has already been implemented.

As discussed earlier, inflexibilities exist for segment reporting in SAP ERP. Each line item in the FI document or PCA document can have only one assignment. In many cases, it's desirable to split transactions between segment reporting objects to update the segments accurately instead of updating them by periodic adjustment postings. To achieve a split using the segment reporting object, separate line items would need to be created in the financial documents. SAP S/4HANA provides this capability with the *splitting functionality* and ensures *balanced books* on segment reporting objects. SAP introduced the splitting functionality in SAP ERP and kept the functionality and required settings the same in SAP S/4HANA. In the next section, we discuss the splitting functionality, explain how you can have balanced books on splitting characteristics, and give recommendations on splitting design.

3.2.2 Splitting and Having Balanced Books on Segment Reporting Objects

Splitting is a very powerful functionality that enables line items to be divided for selected dimensions at the accounting transaction creation time. Document splitting ensures that transactions are always balanced on segment reporting objects, such as profit center and segment. All splitting and segment dimension information is updated for the general ledger view of the document. As an example of what happens during splitting, consider an invoice from a vendor, which is posted with multiple expense lines to different segments. Splitting ensures that the supplier line item is split in a way to reflect the expense lines segment, and documents are balanced for every segment.

A comparison of the same documents with split form and without split form, along with the segmented balance sheet, is illustrated in Figure 3.4 (for simplicity, not all the details of the postings are illustrated in the figure). On the left side of this figure, a document without splitting is illustrated. The expense lines are posted to relevant profit centers and segments, but the vendor and the tax lines aren't posted to the profit center and segment, resulting in unbalanced books for the profit center and segment. On the other hand, vendor and input value-added tax (VAT) line items are split according to the proportion of expense line amounts and posted to the relevant profit centers and segments, resulting in a balanced book entry at the profit center and segment level, as shown on the right side of the figure.

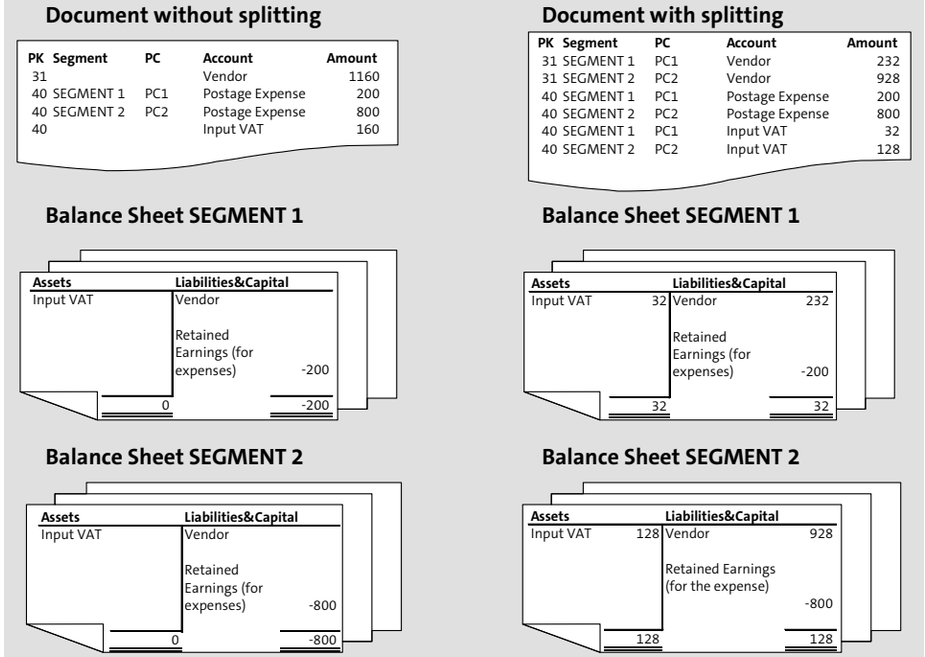


Figure 3.4 Unsplit and Split Comparison

To get segmented financial statements on selected dimensions, you need to define them as splitting characteristics. For example, by defining the profit center and segment as splitting characteristics, a balanced financial statement for these dimensions is generated, as in the example in Figure 3.4. Splitting is facilitated by splitting rules, which are predefined in the standard business content of SAP S/4HANA. Figure 3.5 illustrates a schematic view of the splitting rule definition.

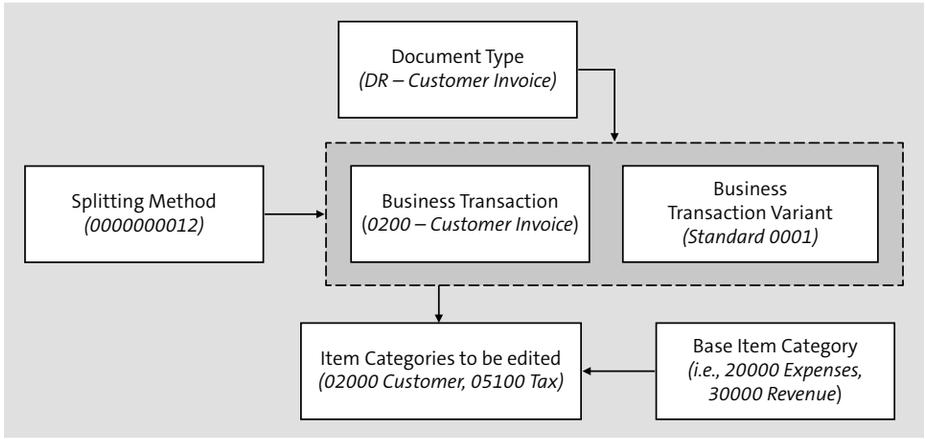


Figure 3.5 Splitting Rule Definition

To explain splitting rules, we'll first give detailed definitions of the key terms used, as follows:

- **Business transaction**
  A business transaction is an event that leads to a value update in financial accounting, for example, customer invoice and vendor invoice. Business transactions are predelivered by SAP. You can't define a new business transaction.
- **Item category**
  The item category characterizes the items of an accounting document, for example, customer, vendor, and asset. Like business transactions, you can't define an item category.
- **Business transaction variant**
  A business transaction variant is a special version of a business transaction in which you can further limit the item categories that are specified in the business transactions.
- **Splitting method**
  The splitting method defines how the split is performed. Combined with the business transaction and business transaction variant, the splitting method produces the splitting rules.

Now that we've explained the key terms used in splitting, let's look at how splitting rules are defined. Splitting rules determine which item categories will be split, as well as which base can be used for splitting. For example, the customer invoices business transaction (0200) with business transaction variant (0001) will be split along with taxes on sales and purchase items based on item categories 20000 expenses and 30000 revenue, as just shown in Figure 3.5.

You can define your own splitting rules. Note, however, that it's recommended that you don't change the standard splitting rules. If you need to change the standard splitting rules, first copy them to your own rules and further modify them according to your business needs.

To understand the splitting mechanism, let's look at a splitting simulation example. Figure 3.6 and Figure 3.7 show how you can simulate the general ledger posting to see the splitting rules used in the posting and configuration settings behind the splitting rules. In this example, we allocated cash from **Profit center YB110**, which belongs to **Segment 1000_A**, to **Profit center YB111**, which belongs to **Segment 1000_B**. If you choose **More • Document • Simulate General Ledger** from the menu bar, the system shows the details of the general ledger view of the document, as shown in Figure 3.6.

Figure 3.7 shows the general ledger simulation view of the document. Because we activated zero balancing of the segment and profit center dimension, the system generated two additional balancing lines with the clearing account (2950100) automatically. This ensures zero balancing of the segment reporting dimension. By clicking on the **Expert Mode** button in the application menu bar, you can see the splitting rule details that were used to split the document. For example, the splitting rule consists of **Splitting Method 0000000012**, **0000** unspecified posting **Business Transaction**, and **0001**

Business Transaction Variant, as shown in the **Configuration of Doc. Splitting** box on the left side of the figure.

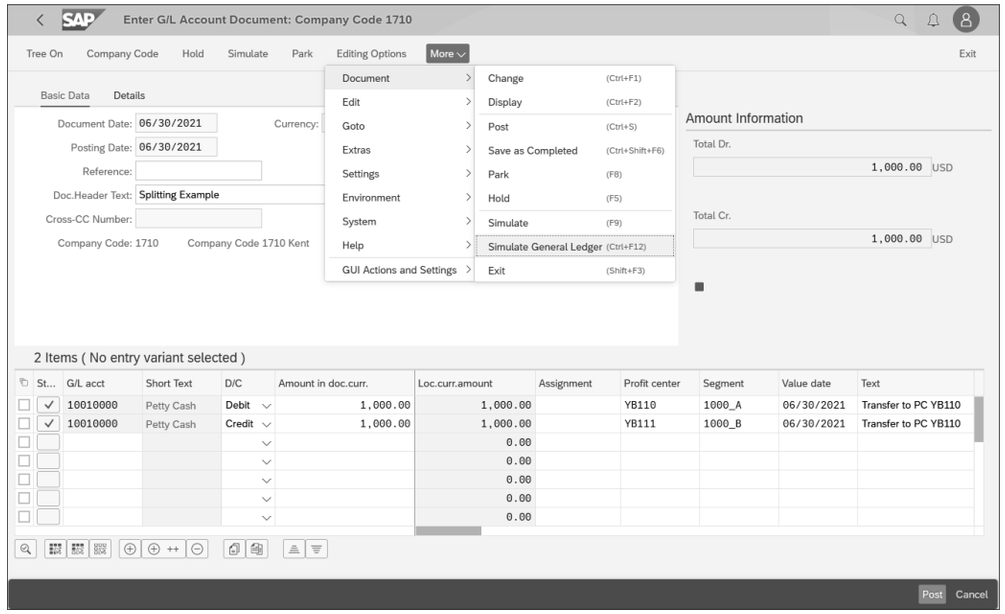


Figure 3.6 General Ledger Simulation (1 of 2)

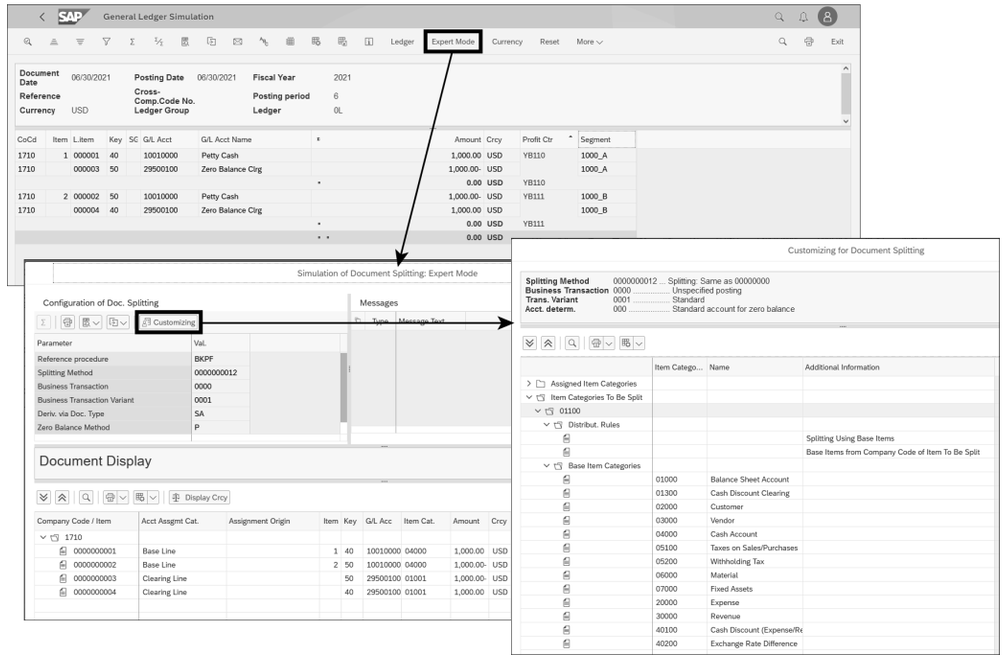


Figure 3.7 General Ledger Simulation (2 of 2)

Following are recommendations on splitting and having balanced books on segment reporting:

- Define the splitting characteristics as the dimensions that will be used to produce segmented financial statements.
- Select zero balancing characteristics for the splitting characteristics. By doing so, balance books are secured for the splitting characteristics.
- Select the mandatory characteristic option for splitting characteristics. As a result, selected characteristics are populated in each document line.
- Activate the inheritance option so that if no reporting dimensions are specified, characteristics are populated from the offsetting lines.
- Specify a default assignment for cases where the reporting objects can't be determined.
- Assign revenue, expense, balance sheet, and bank and cash accounts to the right item categories.
- Assign new document types to business transactions and business transaction variants.
- Review the splitting rules if you define a custom field as a segment reporting object and splitting characteristic.

By using the splitting functionality and enabling balanced books, you can streamline and simplify your segment reporting. Now let's look at another leading practice for segment reporting, which is to capture and record all transactions with segment information.

3.2.3 Capturing All Transactions with Segment Information

The foundation of supporting segment compliance is the availability of segment-relevant data, which is generated as a result of both finance and logistic business processes. Therefore, alignment of those processes and capture of segment information is critical to ensure the generation of accurate reports. In this section, we look at the challenges of capturing the derivation of specific items with segment information. As we discussed earlier, the leading practice is to use a segment or profit center for segment reporting. Let's look at the mechanism of segment derivation and capturing segments in all transactions.

The derivation of segments in transactions is met, broadly, by the following options:

- **Deriving from profit center**
  You can derive segments from the profit center master data. Profit centers are assigned to cost objects (cost centers, internal orders, WBS elements, etc.), sales orders, and materials. When you post to any of these cost objects, the system automatically updates the profit center and relevant segment simultaneously.

- **Using BAdIs**
  If you're not using profit center master data in your implementation, you can define custom derivation rules with BAdI `FAGL_DERIVE_SEGMENT` to populate segments automatically. BAdI includes not only an ABAP routine but also rule-based derivation rules similar to finance validation and substitution definitions.
- **Using constants for nonassigned processes**
  In certain postings, it's not possible to derive or identify the correct account assignments at the time of the posting because the required information isn't available or is too difficult to obtain. Nonassigned processes could cause misstatements in segment reporting. Thus, we recommend using constants, or "defaults," for nonassigned postings. In some cases, you need to allocate the nonassigned amounts collected in the constant segment to other segments with allocation cycles. In other cases, it's possible to determine the original correct assignment at a later stage. This may appear a bit confusing at first.

  We can explain this mechanism with a cash receipt example in which a cash receipt from a customer is posted to the company's house bank. When the cash is first received, it's not immediately known which invoices are paid by this cash receipt. Figure 3.8 illustrates the posting journal and financial accounting postings. When you review the postings, you can see how the segment is originated from the customer invoice. In step ❶, the customer invoice is captured and recorded in the system with the correct segment. Then a posting from the bank account against the cash receipt is made. Because there is no segment information available in the cash receipt, a *default segment* is used. The cash receipt clearing account is debited, and the bank account is credited on a default segment ❷. Next, the cash receipt account is posted against the customer account during the clearing of the invoice, the correct segment (SEG1) is determined from the cleared invoice, and cash receipt accounts are cleared against each other ❸. Because both positions are assigned to different segments, corresponding segment balancing lines are generated ❹. As a result, the receipt clearing account is updated with the correct segment derived from the customer invoice, which wasn't possible when the cash was first received by the company's house bank.
- **Updating segments manually**
  Another way of populating segment information is capturing the segment details manually at the time of the financial posting. Note, however, that there is always a risk of populating wrong segment information with this method, resulting in the inaccurate representation of financial information, so we don't recommend updating the segments manually. Nevertheless, if you need to use this method, we recommend increasing the system's built-in controls to reduce the risks associated with a manual update.

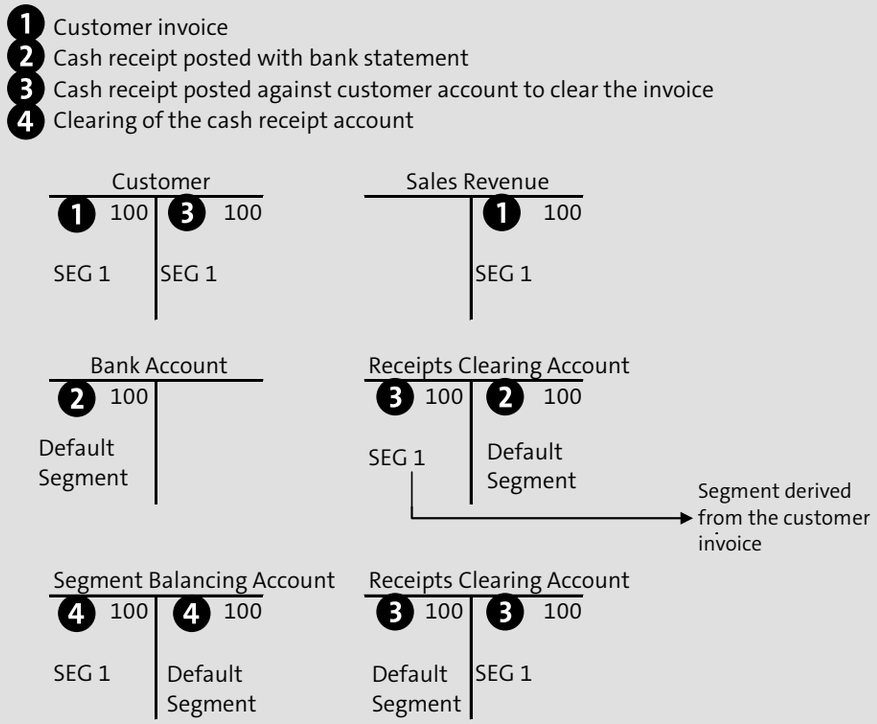


Figure 3.8 Financial Accounting Postings

Profit Center Assignment to Selected Balance Sheet Items

With SAP S/4HANA, profit center to balance sheet assignment functionality is the same as SAP ERP. The system allows you to automatically assign a profit center for individual company codes and ranges of accounts. Companies often like to automate the assignment of some balance sheet items to profit centers. You can do the assignment by using Transaction FAGL3KEH. In addition to the standard settings, the rule can be extended with the use of BAdIs of financial accounting substitution. The derivation of partner profit centers for consolidation purposes is also supported with the use of BAdIs.

Now that we've explained how to capture all transactions with segment information, we can look at another leading practice, which is related to allocation.

3.2.4 Universal Allocations

One of the important design considerations for segment reporting is related to allocations. For example, do you need allocations in the SAP S/4HANA general ledger? What happens to old management accounting cost allocations? With new general ledger

allocations, will you encounter similar problems as in SAP ERP when using Profit Center Accounting (EC-PCA) allocations?

Starting with the SAP S/4HANA 1909 release, SAP introduced *universal allocations*. The name "universal" suggests that universal allocations are based on the Universal Journal. The allocation is similar to the traditional allocation but combines the functionality of traditionally separate allocation transaction codes. Universal allocations provide enhanced functionalities to perform allocations for profit centers and segments from the general ledger accounting perspective. The allocated values can be primary costs and revenues, secondary costs, nonoperating expenses and incomes, balance sheet account values, and quantities.

EC-PCA allocations in SAP ERP traditionally created cross-component reconciliation issues. The new allocation capability introduced with universal allocations in SAP S/4HANA gives you the ability to maintain cycles and execute them in the Universal Journal both for plan and actual allocations. With these new apps, you can create new allocation cycles to periodically allocate amounts and quantities from sending objects to receiving objects and update the segment reporting dimensions simultaneously. In other words, there is no longer a reconciliation problem because the transactions are updated in the general ledger with all dimensions. The recommended leading business practice is to use allocations in the Universal Journal and define a transparent allocation process. As the functionality is relatively new, SAP has the vision to enhance it and ultimately move away from classic allocations completely. Currently, universal allocations have some limitations around the use of functional areas, custom fields, and activity types (see SAP Note 2936255 for more information).

The universal allocation functionality is enabled by SAP Fiori for a simplified and unified user experience (UX). Two standard SAP Fiori apps are used for universal allocations: Manage Allocations and Run Allocations. Let's review some of the key parameters of the selection screen of the Manage Allocations app in Figure 3.9, as follows:

- **Allocation Context**
  The sender and receiver objects that are used in allocation or distribution are defined by choosing from the three allocation contexts available in the system:
  - **Cost Centers**: Amounts or quantities of one or more sending cost centers are allocated or distributed to receiving cost centers or projects.
  - **Margin Analysis**: Summarized costs are distributed from higher-level profitability segments to lower-level profitability segments.
  - **Profit Centers**: Amounts or quantities of one or more sending profit centers are allocated or distributed to receiving profit centers.
- **Allocation Types**
  The following allocation types are used to define the summary of the process for the allocation:

- **Top Down Distribution**: Some of the expenses, such as advertising, insurance, and freight, can't be assigned to a detailed level such as product or customer. They are typically posted at a higher level such as company code, sales organization, and division. Top-down distribution is used to allocate these types of costs to a detailed level based on reference information, such as sales revenue, to support margin analysis.
- **Overhead Allocation**: Overhead allocations are also called assessments. With overhead cost allocation, the allocation is carried out with an overhead allocation rather than the original accounts.
- **Distribution**: Amount and quantities are allocated from the sender objects to receiver objects with the original general ledger account postings. You can carry out distribution with both plan and actual data.

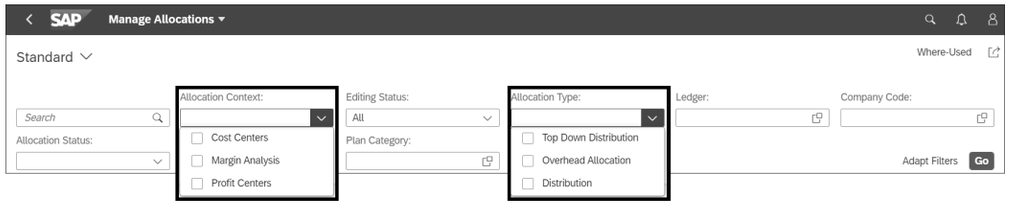


Figure 3.9 Manage Allocations App: Selection Screen

The following section introduces another important design decision that can increase the effectiveness of generating segment reporting.

3.2.5 Rationalizing the Number of Profit Centers

One frequent question from SAP customers is that they want to know how many profit centers they can create without affecting the performance of generating reports. The number of profit centers you use depends on your organization structure and how your business needs to report. Too few profit centers won't give the desired granularity in the reports, and too many could cause confusion and potential misstatements. It's important to determine the balanced number for your organization, so we'll give you some guidance regarding the number of profit centers. By following this guidance, major system performance problems and misstatements can be avoided.

The system performance depends on various factors, such as the system infrastructure and the number of total records. Among other things, the number of total records is affected by the number of profit centers. Therefore, the important aspect for performance considerations is always the number of profit centers. If there are too many profit centers, there may be performance problems in the system.

Even if physical total records no longer exist in SAP S/4HANA in the Universal Journal (table ACDOCA), data is aggregated in a very large number of processes at runtime and

stored in an internal table for further processing. As such, if there is a large number of profit centers, performance problems or program terminations may occur during the period-end closing or in reporting in SAP S/4HANA. SAP has given guidance on the number of profit centers based on existing implementations and performance statistics (rough estimates):

- **Less than 1,000 profit centers**
  This is a normal installation where performance problems aren't expected.
- **1,000 to 5,000 profit centers**
  Large global organizations typically have this number of profit centers. Performance problems aren't expected.
- **5,000 to 10,000 profit centers**
  This is a lot of profit centers and could cause performance issues. Extensive performance testing should be performed before the production start-up.
- **More than 10,000 profit centers**
  This is classified as an extremely large number of profit centers. It's recommended to redesign the solution and reduce the number of profit centers.

If the number of profit centers isn't carefully controlled, organizations could face the challenge of rationalizing the number of profit centers, so it's vital to design the right and balanced number of profit centers at the beginning.

3.3 Key Reports for Segment Reporting

IAS 8 and FASB Statement No.131 have detailed guidance on which items of revenue and expense are included in segment reporting so that all companies will report a standardized measure of segment results. Disclosures relating to segment reporting include the following:

- Revenue from sales to external customers and to other segments
- Amount of depreciation and amortization for the period and other noncash expenses
- Share of the profit or loss of equity-accounted entities and their relevant investment balances
- Segment result between continuing and discontinued operations
- Goodwill, total assets, and total liabilities
- Capital expenditure
- Nature and amount of any material items of segment revenue and expense that are relevant to explain the performance of a segment

Reports vary depending on the approach that we discussed in the previous section. As mentioned earlier in the chapter, the splitting and balanced books capability combined

with the right reporting solution and objects allow you to get segmented financial statements in SAP S/4HANA. Let's first review the trial balance and financial statement apps in SAP S/4HANA.

3.3.1 Trial Balance

The Trial Balance report is used to validate account balances when preparing the segmented financial statements. With SAP S/4HANA, two trial balance apps were introduced: Trial Balance (app ID F0996A) and Trial Balance Comparison (app ID F2767). Both are analytics apps that support multidimensional analysis and read from the Universal Journal. The multidimensional analysis of the query behind the apps enables you to analyze results sets for any available dimension.

When you execute the Trial Balance app in the SAP Fiori launchpad, a selection screen will appear (see Figure 3.10). Here, you input your filter values for the trial balance report. The report has mandatory input filters marked with red asterisks, such as **Ledger, Company Code**, **Posting Date From,** and **Posting Date To**. You can select single or multiple values in your filter, as well as add more filter dimensions by clicking the **Settings** button. For example, you can add segment reporting dimensions in the prompts, such as segment and profit center, and update the filter values for these dimensions. If you have too many dimensions added to the selection screen, you can use the search box to locate a dimension and apply filters.

Figure 3.10 Trial Balance App: Selection Screen

After filter prompts are applied, the results set of the Trial Balance app displays **Starting Balance in Company Code Currency**, **Debit Balance in Company Code Currency**, **Credit**

Balance in Company Code Currency, and **Ending Balance in Company Code Currency** for the selected **Measures**. You can add **Dimensions** to the report's rows or columns by dragging and dropping. For example, if you add a fiscal year period dimension to the report's rows or columns, the report's results set will show balances by fiscal year/periods. You can search for dimensions and add them to the results set.

Right-clicking a dimension will show the context menu from which you can change how the dimension is displayed. For example, you can add the hierarchies and attributes of the dimension or simply display the keys instead of the text. Figure 3.11 shows a segment dimension along with the general ledger account hierarchy in the rows of the results set.

The results set can be shown as a chart, table, or chart/table by clicking the **Display** button. To improve the UX, we recommend pausing the report while making the layout settings (especially if a large set of data is selected) and refreshing the results once the desired layout is set. The **Pause** button is in the navigation panel. You can also create a layout variant of the app with filters already filled in so that you don't need to reenter the information. You also can export the results to Microsoft Excel for further analysis, as discussed in Chapter 1.

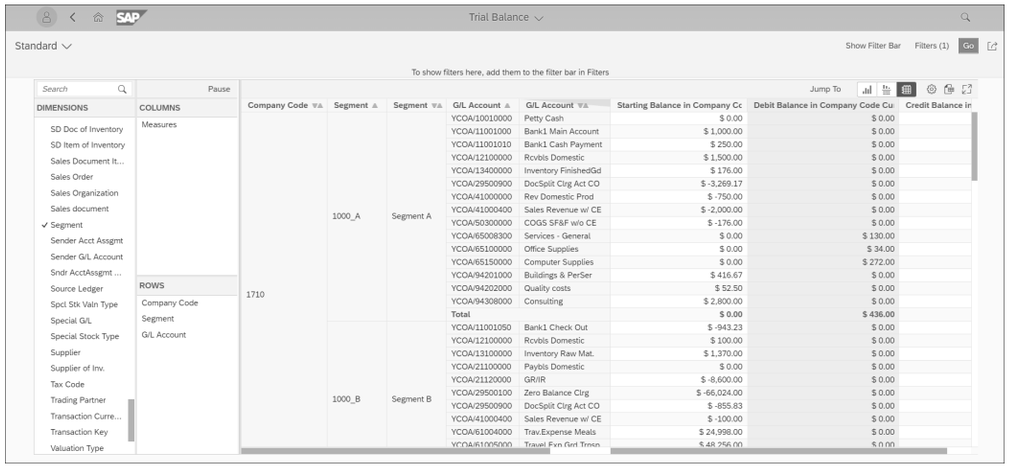


Figure 3.11 Trial Balance Report

You can update prompts from the report output screen by choosing **Settings • Show Prompts** (see Figure 3.11).

> **Warning**
>
> SAP S/4HANA analytics apps don't read from the aggregate table; instead, they read directly from the line-item data, mainly from the Universal Journal. Even with a powerful SAP HANA database, a large data set may cause performance issues. The following are recommendations to reduce the risk of performance issues:

- Use prompts to filter the data and save it as a new tile.
- Pause your results set until you finish making layout changes. Once you're done, click **Refresh** in the navigation panel to see the latest data.
- Filter the dimensions in the results set via the dimension's context menu (right-click the dimension).

The Trial Balance Comparison app (app ID F2767) is another powerful app, similar to the Trial Balance app. The Trial Balance Comparison app compares an account balance with that in another period/year specified in the prompt filters (see Figure 3.12).

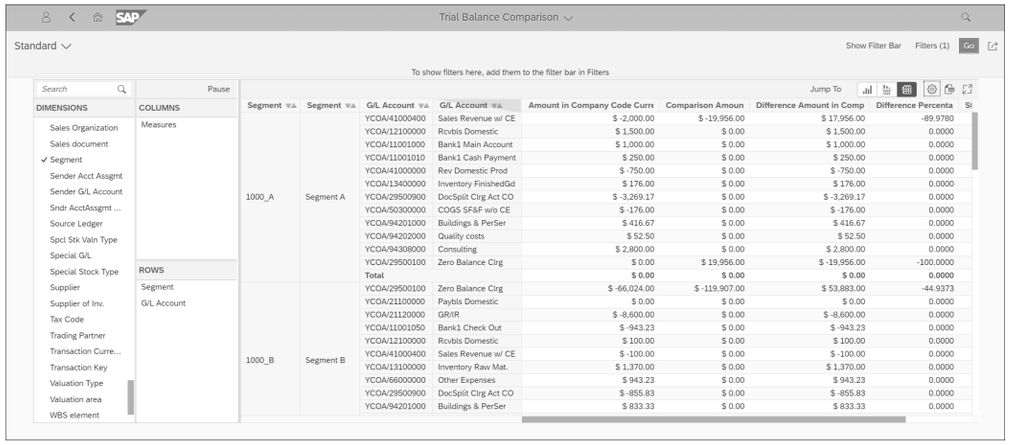


Figure 3.12 Trial Balance Comparison

3.3.2 Segmented Financial Statements

As we explained in Chapter 2, financial statement reports are structured financial representations of the financial positions and financial transactions undertaken by an organization. Typically, a set of financial statement reports will include the balance sheet, income statement, cash flow statement, and supplementary notes. In this section, we'll show you how to generate the segmented financial statement reports. There are two key financial statement apps in SAP S/4HANA: Balance Sheet/Income Statement (app ID F0708) and Balance Sheet/Income Statement – Multidimensional (app ID F3084). Both apps are analytics apps and read data from the Universal Journal.

Balance Sheet/Income Statement

When you execute the Display Financial Statement app (app ID F0708) in the SAP Fiori launchpad, a filter and empty results set will appear. Here, you input your filter values for the Display Financial Statement app. The report has mandatory input filters marked with red asterisks, such as **Ledger, Company Code**, **Statement Version**, **Statement Type**,

End Period, **Comparison End Period**, and **Currency**. You can select single or multiple values in your filter, as well as add more filter dimensions by clicking the **Adapt Filter** button and selecting the corresponding dimension, such as **Segment**. Once you've entered your filter values, you can click the **Go** button. Each time you update the filter criteria values in this report, you need to click the **Go** button to refresh the results set. Financial statement values will be shown in the results set (see Figure 3.13).

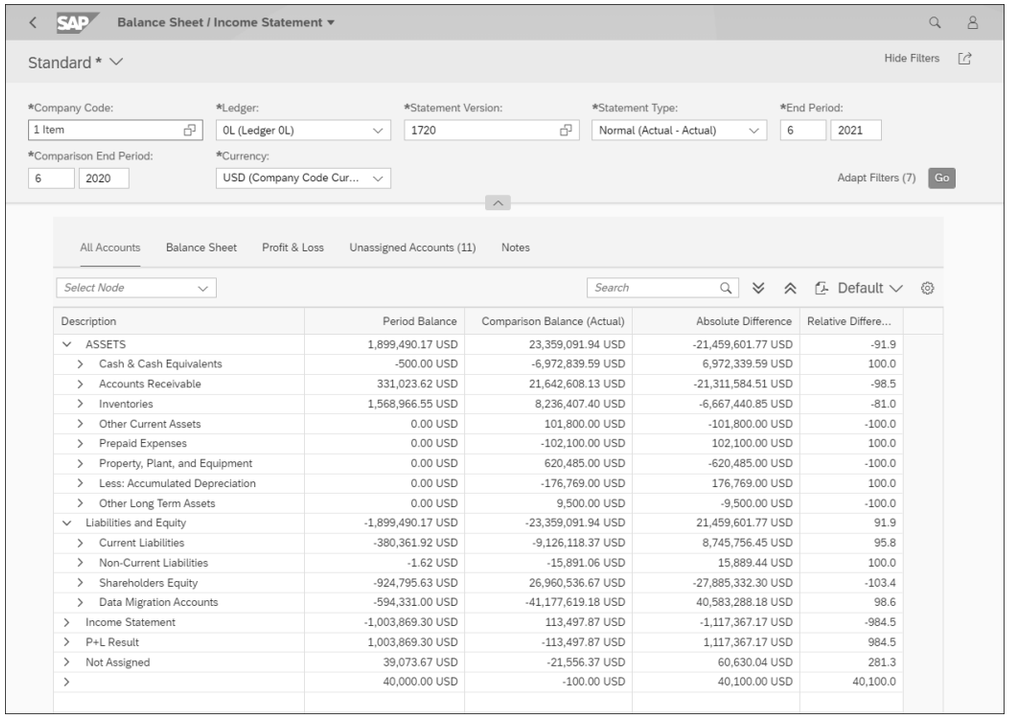


Figure 3.13 Balance Sheet/Income Statement App

By clicking the **All Accounts**, **Balance Sheets**, **Profit & Loss**, and **Unassigned Accounts** tabs above the results set, you can navigate among the corresponding pages. The results set in the reports are based on all the relevant line items aggregated after you click the **Go** button. By clicking the figures in the results set, you can jump to the detail of the line items of a specific general ledger account and other reports. To bring segments or other dimensions to the results set, you need to click the **Settings** button and select the corresponding dimension; the results set will automatically be updated. The report can be exported as a PDF file using interactive Adobe forms.

The Display Financial Statement app supports time-dependent hierarchies. You can select the FSV key date in the filter criteria to display the financial statement version (FSV) of that date.

Note

To export financial statements to an Adobe PDF file, you need to click the **Export to PDF** button (refer to Figure 3.13). To maintain the forms to produce highly formatted financial statements, you need to use the Maintain Form Templates app (app ID F1434). With this app, you can maintain your financial statement form templates. SAP has forms that are predelivered and used as references (such as form `FIGL_BSAIS_EN`).

Balance Sheet/Income Statement – Multidimensional

The Balance Sheet/Income Statement – Multidimensional app is a standard analytics app used for analyzing segmented financial statements in SAP S/4HANA. You can access this app by clicking the **Balance Sheet/Income Statement** app tile in the SAP Fiori launchpad, which will open a window in which you can filter values for the report. The report has mandatory input filters marked with red asterisks, such as **Ledger**, **Company Code**, **Hierarchy ID** (FSV), **Fiscal Year**, **Comparison**, and **Year**. You can select single or multiple values in your filter and add more filter dimensions by clicking the **Settings** button. For example, you can add segment reporting dimensions, such as segment or profit center, and update the filter values for these dimensions. After clicking the **OK** button, the results will appear on the screen in the SAP Fiori app (see Figure 3.14).

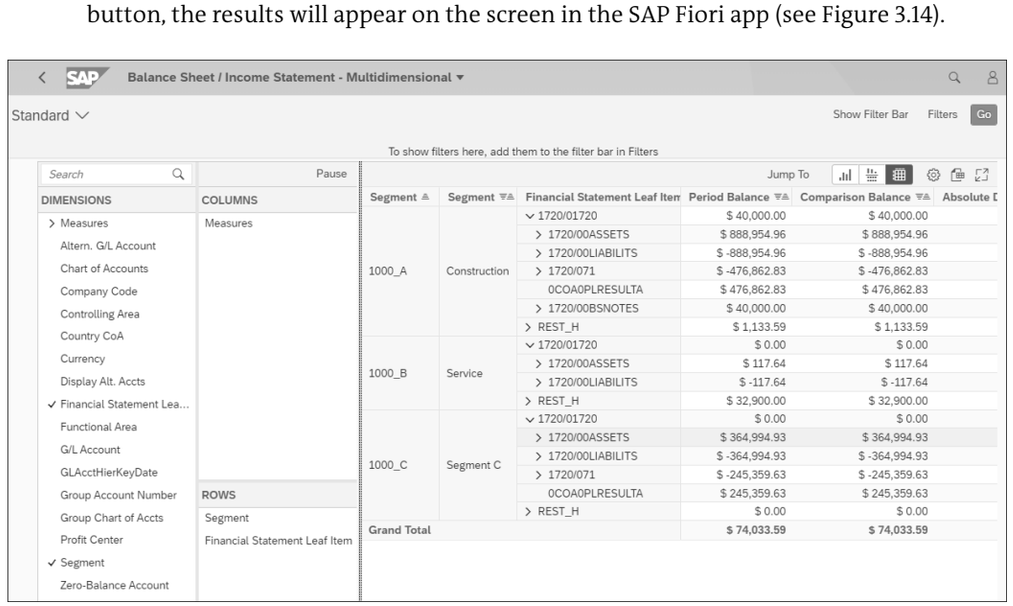


Figure 3.14 Balance Sheet/Income Statement – Multidimensional App

The results set displays **Period Balance, Comparison Balance**, **Absolute Difference,** and **Relative Difference** for the specified periods. You can search for dimensions and add them to the results set by dragging and dropping. Right-clicking a dimension will show

the context menu in which you can change how the dimension is displayed. For example, you can add the hierarchies and attributes of the dimension or simply display the keys instead of the text. Here, we selected the segment dimension and added it to the results area to generate the financial statements by segments (refer to Figure 3.14).

You can show the results set as a chart, table, or chart/table by clicking the corresponding display button. To improve the UX, we recommend pausing the report while making the layout settings and refreshing the results once the desired layout is set, especially if a large set of data is selected. The **Pause** button is in the navigation panel. You can also create a layout variant of the app with filters already filled in so that you won't need to reenter the information in the future. In addition, you can export the results to Microsoft Excel for further analysis.

Drilldown Reporting Mechanism

The drilldown reporting mechanism is based on a multidimensional data set principle. The drilldown principle is illustrated in Figure 3.15, which shows a three-dimensional data set represented by a cube. Typically, reports have more than three dimensions, but for illustration purposes, we used only three: accounts, company code, and segment. Each cube is composed of 27 small cubes. The edge of the small cube represents the value of the dimension. You can look at individual small cubes within the cube or at cross-sections of the cube. By swapping around characteristics, you can view the data from different perspectives.

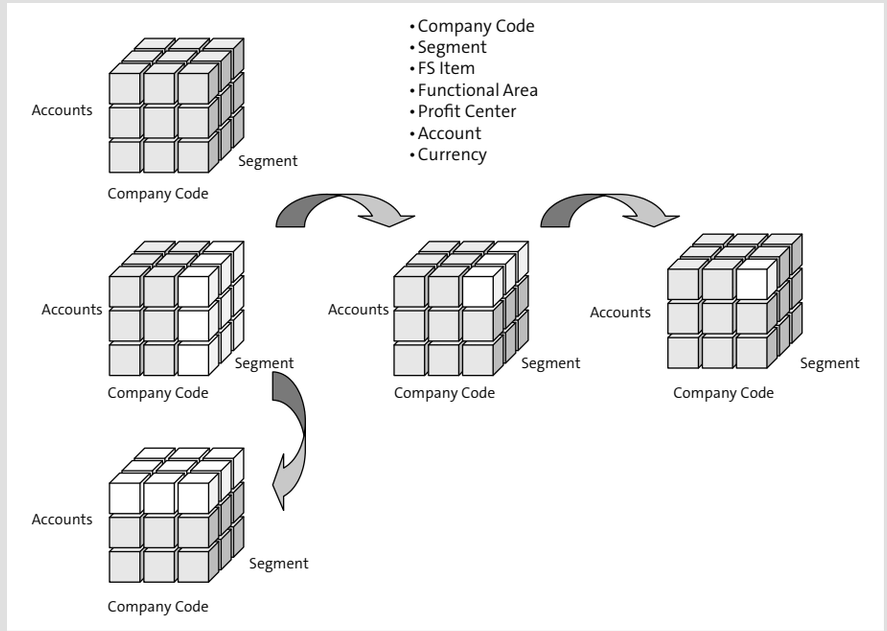


Figure 3.15 Drilldown Mechanism for Segment Reporting

3.4 Key SAP GUI Reports for Segment Reporting

Universal Journal reports such as Financial Statement, Trial Balance, G/L Balance, and G/L Line Items support the generation of reports for segment reporting dimensions. In addition, there are special reports for profit center accounting (e.g., Profit Center Group: Plan/Actual/Variance, Profit Center Group: Plan/Plan/Actual, Profit Center Group: Key Figures, Profit Center Comparison: ROI) and segment reporting (e.g., Segment: Plan/Actual/Variance, Segment: Plan/Plan/Actual, Segment: Key Figures, Segment: ROI) that are available in the Universal Journal (see Figure 3.16 in the next section). Additionally, it's possible to create custom, specific reports based on various reporting tools.

Let's review some of the standard reports that are provided in the Universal Journal.

3.4.1 Profit Center and Segment Reporting in the General Ledger

SAP S/4HANA provides specific profit center and segment reports that access data from the Universal Journal that you can use to further analyze the details of your segmented results. To access these reports for profit center accounting and segment reporting, follow the menu path as we've shown in Figure 3.16: **Accounting • Financial Accounting • General Ledger • Information System • General Ledger Reports**.

As you see in Table 3.1, both profit center accounting and segment reporting have reports classified into four categories.

Reports for Profit Center Accounting and Segment Reporting	Description
Plan/Actual/Variance	This report shows the variance between actual versus plan data for a selected period for a segment/or profit center group.
Plan/Plan/Actual	This report is used to compare multiple plan data with actual data for a segment or profit center group.
Key Figures	This report shows the most important financial key figures for a segment or profit center group.
ROI	This report shows the comparison of P&L relative to investments between segments or profit center groups.

Table 3.1 Reports for Profit Center Accounting and Segment Reporting

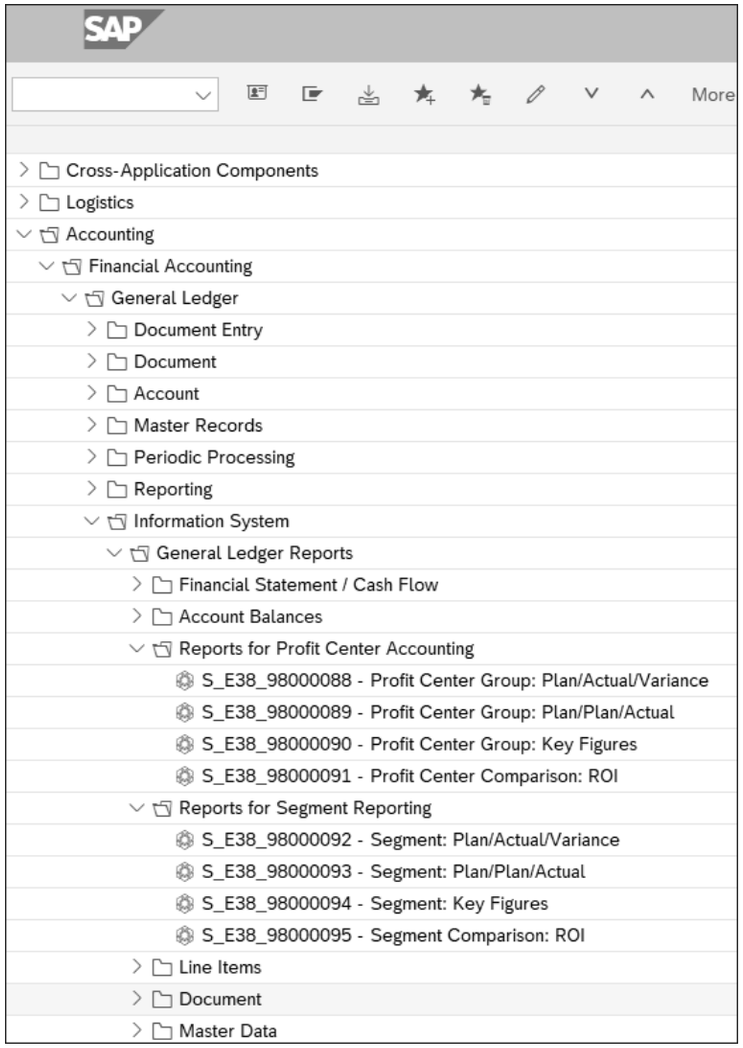


Figure 3.16 Reports for Profit Center Accounting and Segment Reporting

All these reports are multidimensional reports and support multiple views of segment information. In the selection screen, you can select the segment reporting dimensions such as profit center or segments. An example output of one Profit Center: Plan/Actual/Variance report is shown in Figure 3.17.

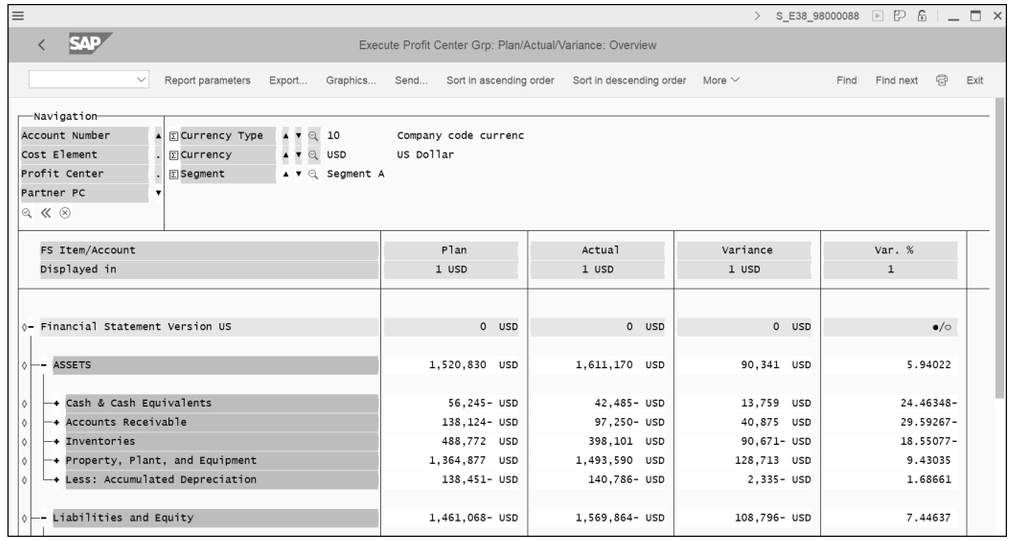


Figure 3.17 Profit Center Group: Plan/Actual/Variance Report Output

Note

The reports in Classic PCA have remained unchanged in SAP S/4HANA. Note that the Classic PCA reports don't display any data if the update to Classic PCA isn't activated (Transaction 1KEF).

The libraries for Classic PCA in Report Writer are part of the compatibility scope and are available only for a limited period of time. You can use report FAGL_RMIGR to change the data source of your existing reports.

3.4.2 Account Balances and Transaction Figures

SAP introduced the use of new reporting dimensions to support segment reporting in account balances and transaction figures reports before SAP S/4HANA. You can continue to use these reports when analyzing the results for your segments. To access these new reports, follow the menu path **Accounting • Financial Accounting • General Ledger • Information System • General Ledger Reports • Account Balances • General • G/L Account Balances**, and then select either **G/L Account Balances (Detailed)** or **Transaction Figures: Account Balance** (Transaction S_PLO_86000030 [G/L Account Balances Detailed report] or Transaction S_PLO_86000031 [Transaction Figures: Account Balance report], respectively).

Both drilldown reports support multiple views of segment information. Figure 3.18 illustrates an example of the G/L Account Balances report.

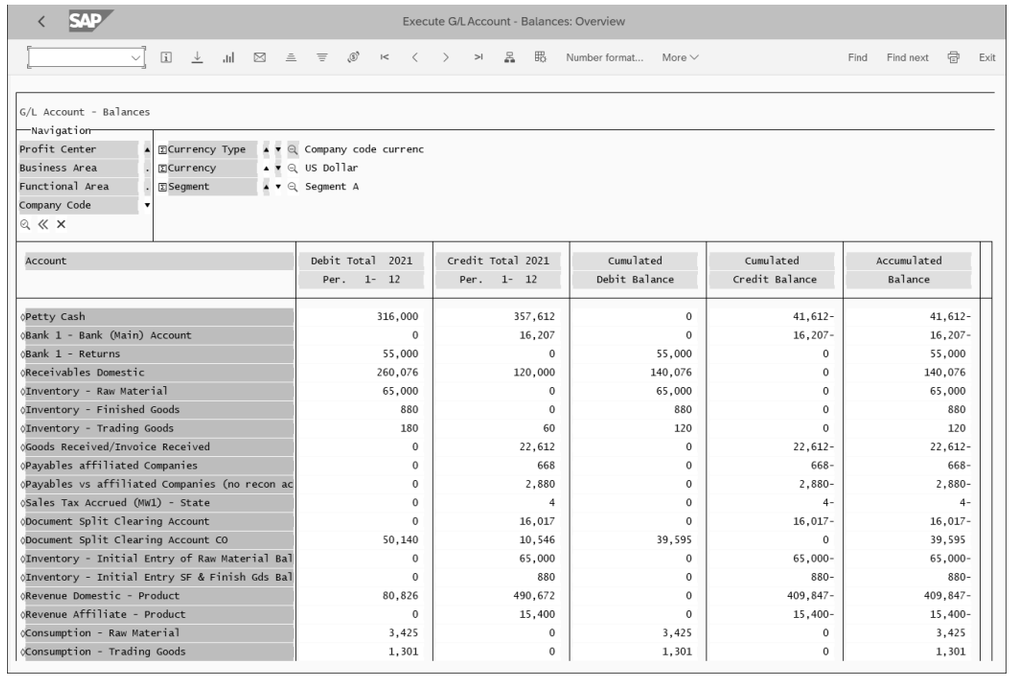


Figure 3.18 G/L Account Balances Report

In our example, we show account balances per segment and currency type. You can further drill down to the profit center level. In addition, you can call up other reports. To do so, first select a particular cell, then choose **More • Goto • Line items** or **Call up report** from the menu bar (see Figure 3.19). The system calls up other reports and displays values of the selections.

The Transaction Figures: Account Balance report is used to see the debit and credit transactions and the corresponding balance and accumulated balance per period for the selected dimensions. You can see the output of the report in Figure 3.20. In this example, the report is run at the segment level.

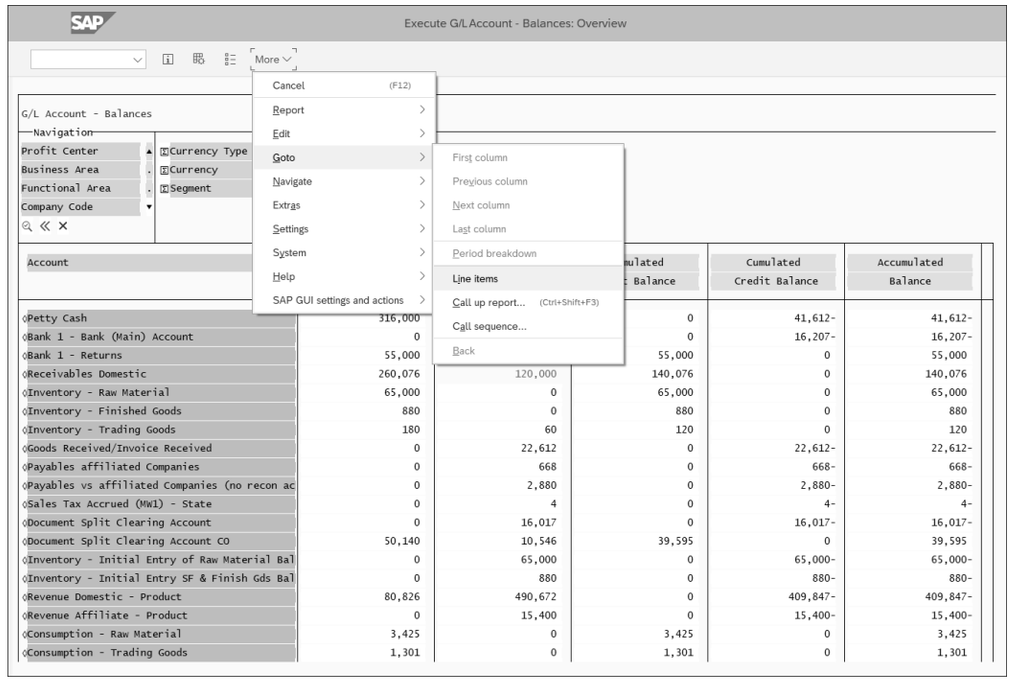


Figure 3.19 Calling Up Another Report from the Account Balance Report

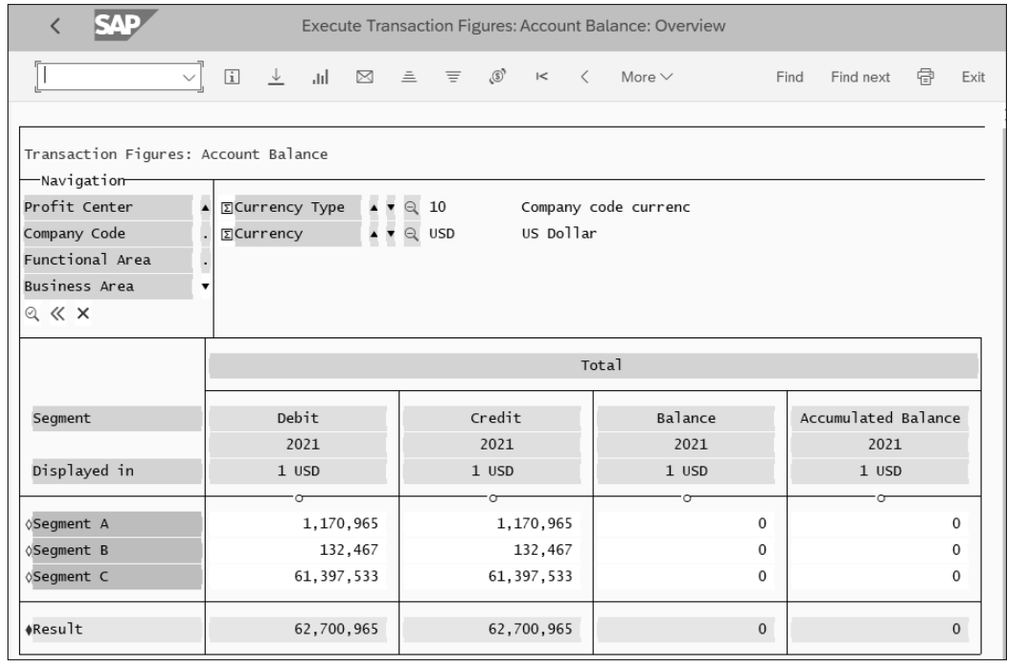


Figure 3.20 Transaction Figures Account Balance Report by Segment

3.4.3 G/L Account Line Item Browser

SAP has introduced the following financial accounting line-item browser transactions in SAP S/4HANA:

- Transaction FAGLL03H: G/L Account Line Item Browser (G/L View)
- Transaction FBL3H: G/L Account Line Item Browser (Entry View)
- Transaction FBL1H: Vendor Line Item Browser
- Transaction FBL5H: Customer Line Item Browser

These line-item browsers have the capability to show the aggregated data on a selected data layout with drilldown capability. The design and functionality of each of the line-item browsers are similar in nature. They are very powerful compared to the old line-item transactions.

Let's first review the G/L Account Line Item Browser (G/L View). To access this transaction, follow the menu path **Accounting • Financial Accounting • Account • FAGLL03H – Line Item Browser**.

This line-item browser displays aggregated data based on a layout of selected fields. One of the biggest advantages of the G/L Account Line Item Browser (G/L View) compared to the old line-item display transactions is the performance as the old line-item transactions display detailed document levels and don't have aggregation capability. The old line-item transactions still exist in SAP S/4HANA, and even with the SAP HANA memory, if you don't limit the selection parameters for these transactions, there may be performance issues. Figure 3.21 shows the G/L Account Line Item Browser (G/L View) selection screen. As you can see, **Ledger** is a mandatory field. To change the ledger from 0L to another ledger, you click the **Choose Ledger** button and select the ledger you want to execute the report. In our example, we selected **Ledger 0L** and **Company Code 1710**. In this situation, we want to report **Open Items at Key Date** "06/07/2021".

Figure 3.22 shows the example output of the G/L Account Line Item Browser (G/L View) report. You can drill down on selected rows and display additional fields for the output selection or jump to the financial accounting document display. The power of the line-item browsers is that they can make many reporting dimensions such as general ledger account, profit center, business partner, and so on available due to the Universal Journal. This enables you to generate reporting from one tool, which was previously available in separate transactions in various modules. For example, the G/L Account Line Item Browser (G/L View) selection layout allows most of the fields in the Universal Journal as well as many fields from the finance Accounting Document Header table (BKPF), Accounting Document Line Item table (BSEG), and account master data tables such general ledger master data and business partner master data tables.

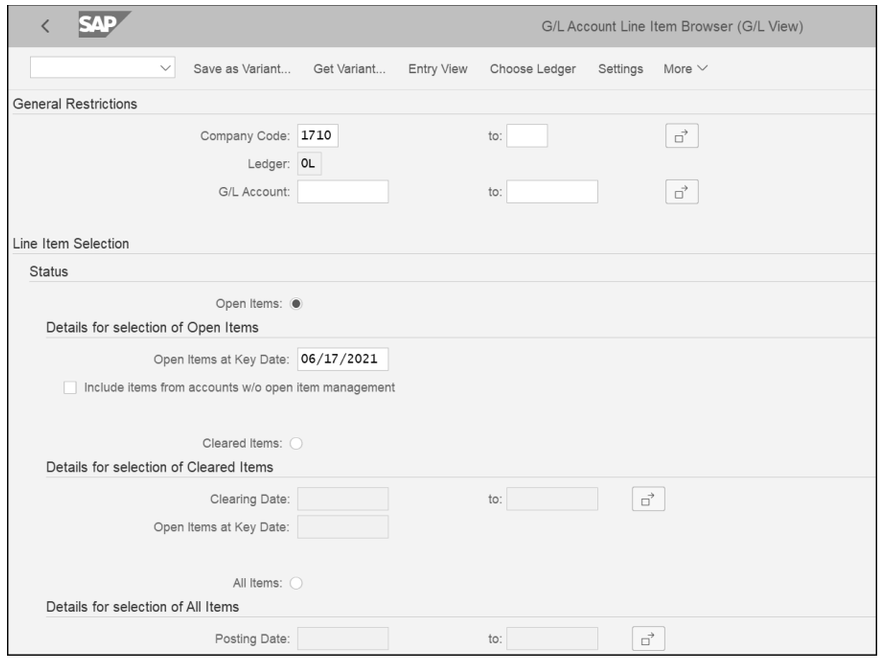
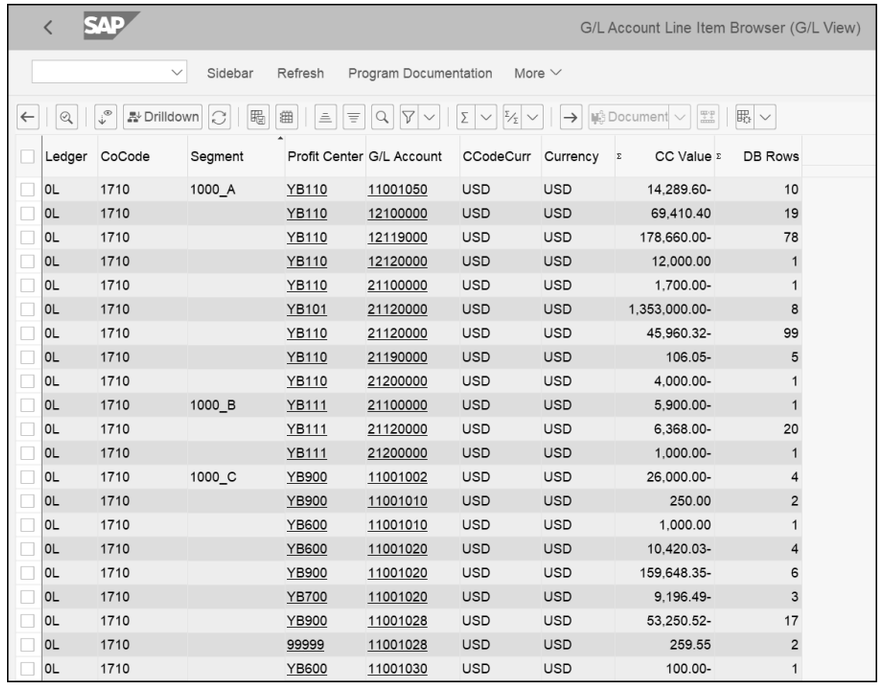


Figure 3.21 G/L Account Line Item Browser (G/L View): Selection Screen



Ledger	CoCode	Segment	Profit Center	G/L Account	CCodeCurr	Currency	CC Value	DB Rows
0L	1710	1000_A	YB110	11001050	USD	USD	14,289.60-	10
0L	1710		YB110	12100000	USD	USD	69,410.40	19
0L	1710		YB110	12119000	USD	USD	178,660.00-	78
0L	1710		YB110	12120000	USD	USD	12,000.00	1
0L	1710		YB110	21100000	USD	USD	1,700.00-	1
0L	1710		YB101	21120000	USD	USD	1,353,000.00-	8
0L	1710		YB110	21120000	USD	USD	45,960.32-	99
0L	1710		YB110	21190000	USD	USD	106.05-	5
0L	1710		YB110	21200000	USD	USD	4,000.00-	1
0L	1710	1000_B	YB111	21100000	USD	USD	5,900.00-	1
0L	1710		YB111	21120000	USD	USD	6,368.00-	20
0L	1710		YB111	21200000	USD	USD	1,000.00-	1
0L	1710	1000_C	YB900	11001002	USD	USD	26,000.00-	4
0L	1710		YB900	11001010	USD	USD	250.00	2
0L	1710		YB600	11001010	USD	USD	1,000.00	1
0L	1710		YB600	11001020	USD	USD	10,420.03-	4
0L	1710		YB900	11001020	USD	USD	159,648.35-	6
0L	1710		YB700	11001020	USD	USD	9,196.49-	3
0L	1710		YB900	11001028	USD	USD	53,250.52-	17
0L	1710		99999	11001028	USD	USD	259.55	2
0L	1710		YB600	11001030	USD	USD	100.00-	1

Figure 3.22 G/L Account Line Item Browser (G/L View): Output

The other line-item browser that was introduced with SAP S/4HANA is the G/L Account Line Item Browser (Entry View). This browser isn't included in the menu path. You can either use Transaction FBL3H or call this report in the selection of the G/L Account Line Item Browser (G/L View) by clicking **Entry View** (see Figure 3.21). G/L Account Line Item Browser (Entry View) is similar to G/L Account Line Item Browser (G/L View) except it only selects the cross-ledger documents that aren't posted to a specific ledger. In other words, this browser only selects documents that have an entry view; as such, the selection screen of G/L Account Line Item Browser (Entry View) doesn't include the ledger dimension (see Figure 3.23).

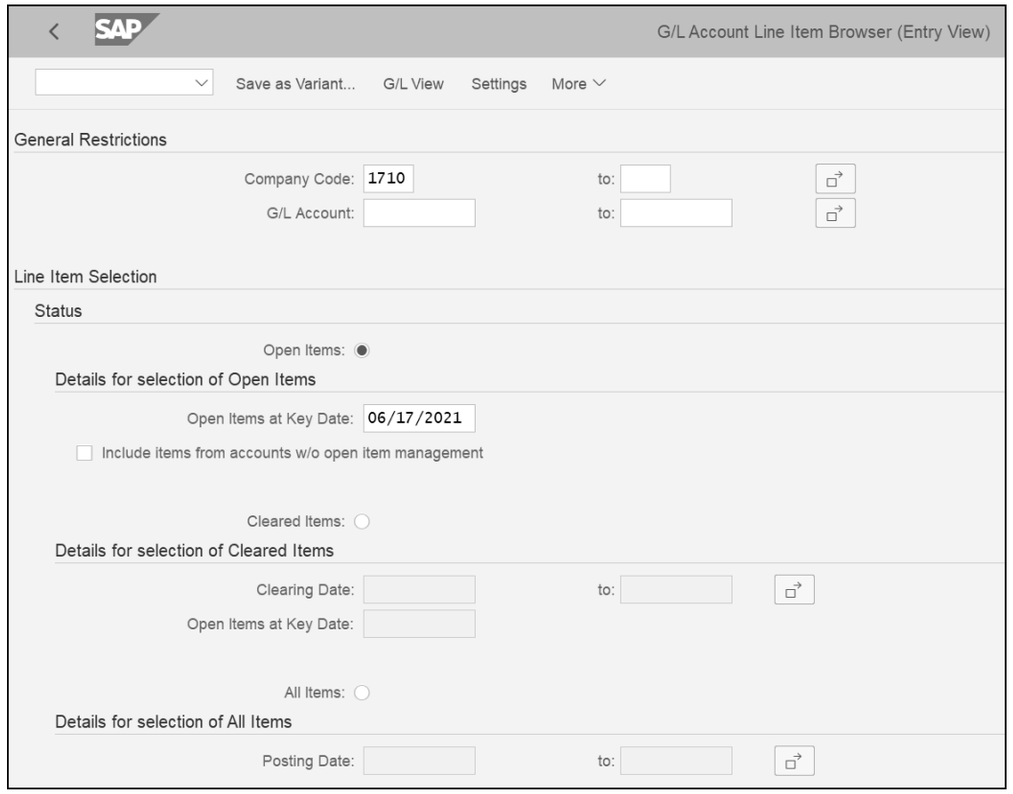


Figure 3.23 G/L Account Line Item Browser (Entry View): Selection Screen

Because G/L Account Line Item Browser (Entry View) doesn't include specific ledger postings, Transaction FBL3H and Transaction FAGLL03H may produce different results (refer to SAP Note 2297729 for more details).

3.4.4 Old Line-Item and Balance Display Reports

In addition to the reports that we explained in the previous sections, you can continue to use the old display line-item report (Transaction FAGLL03) that was introduced in SAP ERP, which is available with the Universal Journal. With this report, you can analyze the line items per segment and other general ledger reporting objects of one or more general ledger accounts per ledger. In the selection screen of the report, you can switch between entry view and general ledger view similar to G/L Account Line Item Browser (G/L View) and G/L Account Line Browser (Entry View). You enter the company code and the account status of the line items in the selection screen. You can further restrict the selection parameters, such as the segment or profit center in the dynamic selection. As we mentioned earlier, the first thing you'll experience is the performance of the report as it will take much more time to produce the results compared to the G/L Account Line Item Browser (G/L View) and G/L Account Line Browser (Entry View) reports.

Figure 3.24 shows an example of the output of the report. As you see in the report output, segments and profit centers of the general ledger line items are displayed along with the other line-item information. Double-clicking on the line items doesn't take you to the document level. To analyze the document of the line item, click on the line, navigate to the environment, and select the document option.

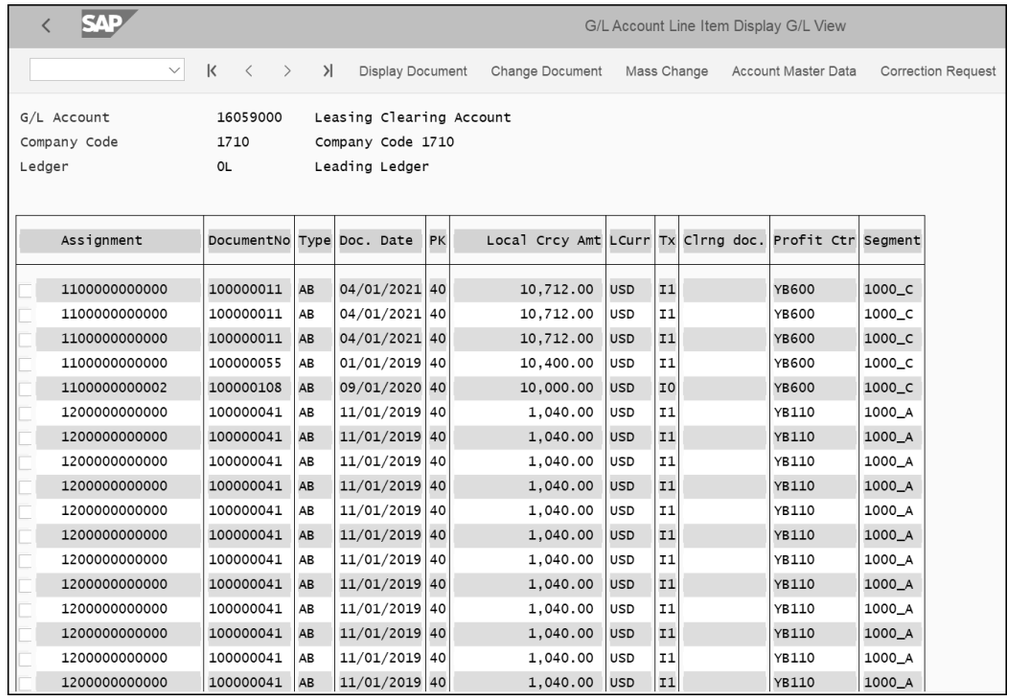


Figure 3.24 Segmented G/L Account Line-Item Report

You can also display an individual or a range of general ledger account balances at the segment or for other reporting dimensions. To do so, use the Display Balances report (Transaction FAGLB03).

The selection screen of the G/L Account Balances report appears. As shown in Figure 3.25, if you click **Free Selections**, a dynamic selection screen pops up. You can choose other reporting dimensions on this screen.

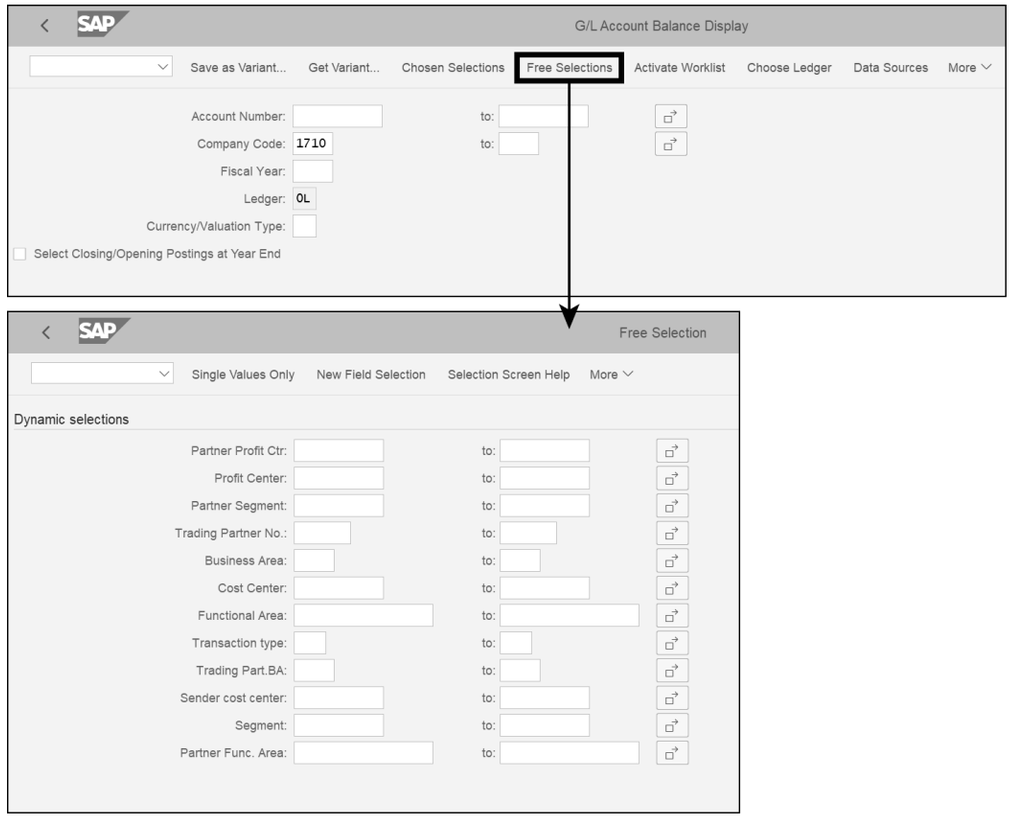


Figure 3.25 G/L Account Balances Display Report: Selection Screen

What Happened to Report Writer and Report Painter in SAP S/4HANA?

Report Writer, Report Painter, Drill Down Reporting, and the SAP GUI applications for line items are still available in SAP S/4HANA. These reports are still supported and have been technically adapted and optimized for the new data architecture. However, these classic reporting tools can only partially benefit from the new SAP HANA capabilities.

The advantages of more detailed reporting with the usage of line information aren't available for Report Painter and Report Writer because the report definition continues

to be based on the old data structures. Report Writer and Report Painter can't benefit from the new extensibility concept of SAP S/4HANA.

Queries based on core data services (CDS) use the new data architecture of SAP S/4HANA. Therefore, CDS-based reporting is better than Report Painter and Report Writer from a performance perspective. SAP recommends using CDS-based reporting tools as explained in Chapter 1 instead of Report Painter and Report Writer.

3.5 Summary

In this chapter, we first focused on the IFRS 8 segment reporting compliance requirements for reporting on an organization's segments. Then, we discussed segment reporting solutions, the key design considerations for segment reporting, and the leading practices to simplify and streamline segment reporting. Finally, we reviewed the new apps introduced with SAP S/4HANA for general ledger as well as the key SAP GUI reports in SAP S/4HANA.

In Chapter 4, we'll explain the tax reporting requirements and tax reporting architecture. We'll also look at the design considerations to show how organizations can streamline and automate the tax process and capture the right level of tax data granularity. This chapter also provides information about the new add-ons and capabilities, such as SAP S/4HANA for advanced compliance reporting, a new solution that helps corporate finance executives manage statutory reporting, and other innovations introduced in SAP S/4HANA.

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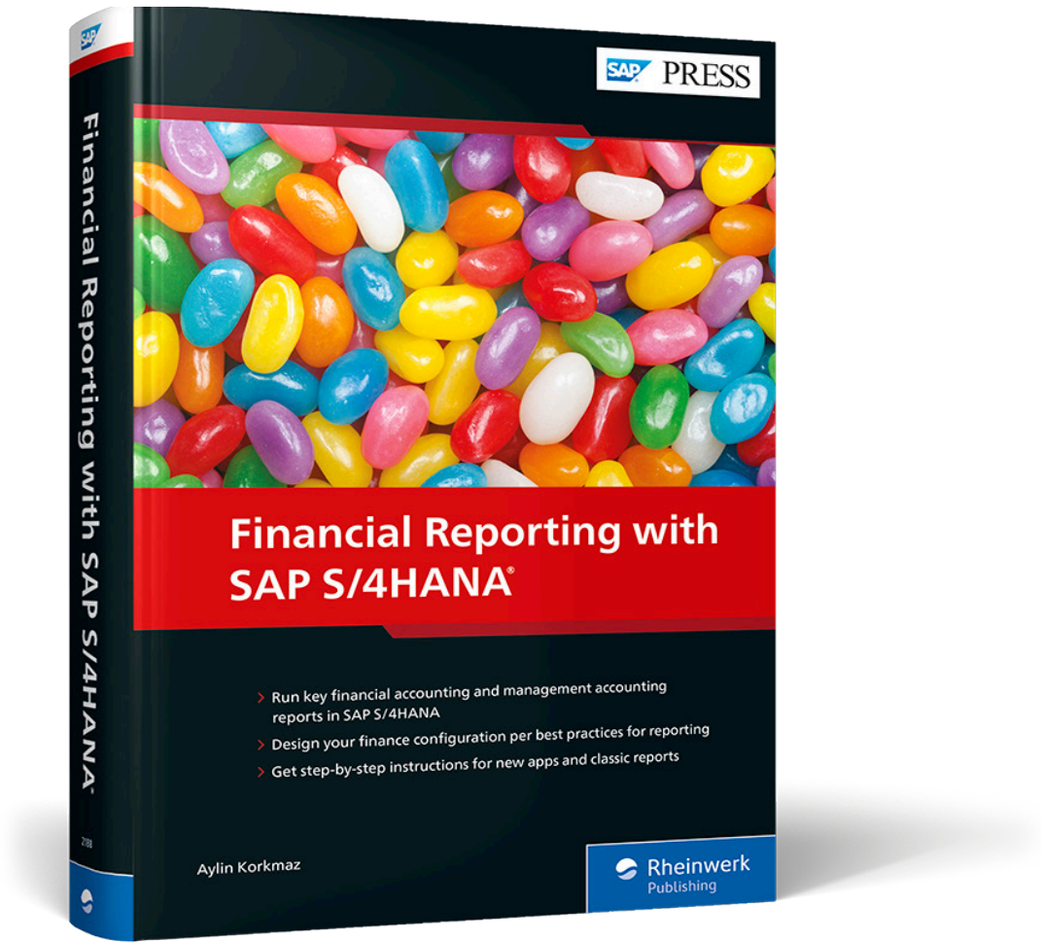

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