

**SAP Solution in Detail
SAP for Banking**



ACCOUNTING IN BANKS: SAP® SOLUTIONS AND ACCOUNTING STRATEGIES

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SUMMARY

SAP offers a comprehensive solution portfolio covering financial and management accounting operations for the banking industry. To ensure that the solution fully covers a bank's needs, a bank-specific solution map is carefully planned that reflects the bank's business model, its organizational setup, and how it has allocated its accounting tasks. The experience SAP has acquired in the banking industry counts as well. Careful observation found that four accounting strategies are typically used by banks, each characterized by a distinct functional scope. This article discusses those strategies, their functional architectures, and how accounting tasks can be integrated to support financial reporting on the legal entity and group levels. Another focus of this paper is to show how SAP® solutions can be placed within those strategies to give banks maximum benefit for their accounting and reporting activities.

From a business viewpoint, the architecture proposed in this paper recommends standardization of accounting methods and accounting processes within a bank or banking group to support better compliance with internal and external accounting rules. Best practices are outlined to enable daily trial closings to minimize surprises at the end of the month, and to ensure that all information supplied to, generated by, and reported by the solution can be audited.

From an IT point of view, the proposed architecture facilitates consolidation of IT operations, maintenance, and support, thereby reducing IT costs and operational risks.

ACCOUNTING FUNCTIONS COVERED

Financial Accounting

The main task of financial accounting is to record all business transactions and summarize the results in periodic reports. For the banking industry the main focus is on accounting for financial products. There are three types of financial products in particular: service contracts, contracts, and instruments.

- Service contracts do not usually generate on-balance financial asset or financial liability positions other than receivables between invoicing and settlement. When service contracts generate off-balance positions, they must be reflected in accounting. Examples of service contracts are customer securities accounts, credit cards, and payment transactions.
- Contracts are based on bank-specific conditions drawn up per contract between the bank and the business partner. They generate financial asset and liability positions. Loans, deposits, over-the-counter (OTC) derivatives, and letters of credit are examples of contracts.
- Instruments – short or long positions in public, tradable financial products owned by the bank – are based on formal legal documents and governed by conditions that are standardized per instrument type. They generate financial asset and liability positions. Examples of instruments are listed securities and exchange-traded derivatives such as futures.

Particular to financial products is the fact that accounting is an integral part of regular operations as some of these operational activities and their related functions directly impact accounting; this is referred to as operational accounting. Operational accounting comprises functions such as nominal position management, billing, invoicing, collection management, write-down, write-off, settlement, and matching.¹ In financial accounting operational accounting refers to the same activities which may be referred to as customer accounting or trade accounting from another point of view. Usually, all financial product-related, accounting-relevant functions – the execution of which is visible to the business partner – are allocated to operations, since these functions are required to record the contractual financial status

1. For transactions between two applications that are not fully integrated, suspense accounts are used because direct postings to the other application are usually not allowed. Matching consists of monitoring these suspense accounts, identifying mismatched positions, and managing these positions.

and produce account statements for the business partner. Tasks such as valuation of financial products, operational accounting for nonfinancial product² transactions, valuation of nonfinancial product positions, hedge management,³ deferred tax calculation, foreign exchange (FX) valuation, subledger accounting interpretation, general-ledger (GL) accounting, generation of additional financial statements (notes, cash-flow statements, and so on), branch consolidation, legal consolidation on the group level, and reporting of financial accounting information are seen for that reason as areas of financial accounting in a banking-specific sense. Branch consolidation is banking-specific because, for regulatory reasons, foreign branches are treated as separate legal entities. Therefore, a consolidation of fabricated legal entities is required to produce the financial statements for the actual legal entity.

Management Accounting

Management accounting involves evaluating and reporting the information management requires to plan, organize, and control. In controlling their business, banks are faced with a specific challenge because interest rate risk, FX risk, and liquidity risks are managed centrally for certain types of business.⁴ Profitability for these types of business must be measured without reflecting the effects on profitability these risks have. This is accomplished by applying an advanced form of funds transfer pricing (FTP). This form of FTP does not focus on funding liquidity gaps, but transfers interest rate risk, FX risk, and liquidity risks from the

units generating the business to the units who manage the risks centrally. This is done by generating internal funding positions and internal interest payments between these units. These funding positions and the internal interest payments are set up in such a way that they neutralize the risks in the business generating units and transfer it to the risk management units. The interest margin for covering credit risks, production costs, and profit expectations remains with the business generating units. The simplified approach of focusing FTP on funding liquidity is often applied for investment and trading portfolios when market risks are allowed as well as for other balance sheet items.

FTP can be applied in two different ways. One method focuses on profit center accounting (PCA), which allows balance sheet statements and income statements to be generated for each profit center. This method consists of evaluating and posting per profit center external interest income and expenses, changes of internal funding positions, internal interest income and expenses, fee income and expenses, changes of impairment provisions, write-offs, expense charges, and discharges. Each profit center has a suspense account for posting transitional debits and credits meant to be posted to another profit center. There is a close correlation between PCA and financial accounting because the results of each can be applied to segment reporting. The granularity of profit centers in PCA is usually linked to the level of segment reporting, with PCA performed on the same level or one or two levels deeper.

2. Nonfinancial product-related accounting here covers accounting regarding property, plants and equipment, investment property, investments in associates and joint ventures, goodwill and other intangible assets, provisions, equity, income and gains or losses related to these positions, depreciation and amortization of tangible and intangible assets, staff and other expenses, tax expenses, and so on. Accounting for transactions and positions related to these items is not specific to banks and hence is not a focus of this paper. Accounting for these items is usually placed in separate subledgers (fixed assets, accounts payable, and accounts receivable to name a few) or in the general ledger.

3. Hedge management here covers allocation, documentation, effectiveness tests, and amount calculation based on GAAP-specific rules. Hedging based on purely economic rationale is seen as part of risk management in treasury or trading units.

4. This refers primarily to business with customers who do not have direct access to capital markets and therefore have to pay a premium to get access to these markets.

SAP SOFTWARE FOR FINANCIAL AND MANAGEMENT ACCOUNTING

Another way FTP can be applied is called profitability analysis. This method evaluates the interest margin, fee income and expenses, costs for covering expected loss, normalized operations costs, and equity costs per contract, customer, product, region, sales organization, and sales channel. The results are provided in the form of a margin tableau without generating double-entry postings.

Cost accounting can be applied to both FTP methods, with cost element accounting and cost center accounting forming the basis for internal cost allocation.⁵ For PCA, the focus is on charging internal prices for services between centers. For profitability analysis, the focus is on calculating internal costs for services and products offered on the market. For PCA, internal prices are charged through double-entry postings, using suspense accounts to square accounts if necessary. For profitability analysis, the calculation is performed per contract, customer, product, region, sales organization, and sales channel and presented in the margin tableau without generating double-entry postings.

The evaluation of costs to cover expected loss⁶ and the evaluation of the cost of equity are usually derived from risk controlling and are not part of management accounting. A bank's fundamental considerations in these areas focus on regulatory requirements and financial risk management methods.⁷

5. The evaluation of prices for internal cost allocation can be based on standard unit costs or on an activity-based costing rationale.

6. $\text{Expected Loss} = \text{Exposure at Default} \times \text{Probability of Default} \times \text{Loss-Given Default}$; evaluation is based on the same rationale as evaluation of the cost of equity.

7. In banks, equity is mainly used to cover risks. The funding function is secondary because the proportion of equity to assets is low compared with other industries. Moreover, with directives such as Basel II, banking regulators stipulate a certain level of capital (equity and certain eligible debts) proportional to the risks (credit risks, market risks, and operational risks) inherent to a bank's business. Economic capital allocation applies a similar rationale. However, the economic capital at risk is not only limited by the minimum regulatory capital acceptable to the banking regulators, but also by the minimum capital required by rating agencies for the planned rating class and by the management's and owners' appetite for risk. Costs to cover expected loss are calculated based on the same rationale as the calculation of regulatory capital and the economic capital at risk.

The SAP software for financial and management accounting includes three major solutions: the SAP Bank Analyzer set of applications, the SAP ERP application, and the SAP NetWeaver® Business Intelligence (SAP NetWeaver BI) component.

SAP Bank Analyzer

SAP Bank Analyzer supports accounting activities for financial products and has two distinct areas for data management functionality: one manages the source data of financial products and one manages the data that reflects how those financial products performed – the results data. The source data includes information on business transactions, contracts, instruments, business partners, and market data, with service contracts modeled as contracts. The results data includes the results of financial product valuation and accounting on a detailed level.

Process and methods functions use the source data to perform multi-GAAP subledger accounting interpretation, multi-GAAP valuation, FTP for financial products, and allocation of standardized production costs, standardized risk costs, and cost of capital. Analytics functions use the results data to perform multi-GAAP financial statement item generation⁸ and subledger posting aggregation. Functions for covering financial accounting for financial products are available with the current release of SAP Bank Analyzer. Functions for covering FTP and allocation of standardized production costs, standardized risk costs, and cost of capital will be available with the next release of SAP Bank Analyzer (release 6.0).

SAP ERP

With its integrated enterprise resource planning (ERP) functionality, SAP ERP provides industry-independent accounting functions and operations support. The ERP functions cover three areas used in the accounting strategies described in this paper: ERP operations, general-ledger functionality, and consolidation.

8. Financial statement items are used to produce detailed balances, income statements, relevant information for notes, cash-flow statements, and relevant information for financial products.

The ERP operations are the same for banking as they are for other industries and aren't described in detail for that reason. They cover operational management and transaction accounting activities for nonfinancial products in the areas of financials, controlling, materials management, sales and distribution, project systems, human resources, and travel management. Procure-to-pay, order-to-cash, intercompany clearing, and record-to-report processes are supported, as are asset life-cycle management, project management, cost accounting, and human resources management.

General-ledger functionality – which covers multi-GAAP general-ledger accounting and multi-GAAP branch consolidation – leverages the general-ledger management functionality and enterprise controlling consolidation functionality of SAP ERP.

The consolidation functionality uses the consolidation and strategic enterprise management functionality of SAP ERP to cover multi-GAAP group and subgroup consolidation.

SAP NetWeaver

With its data warehousing and reporting functionality, SAP NetWeaver BI builds and maintains data marts specifically for financial product accounting, accounts payable, accounts receivable, costs, general-ledger accounting, and consolidation. SAP NetWeaver BI manages source data for consolidation activities and can be used to supply data to the source data of SAP Bank Analyzer.

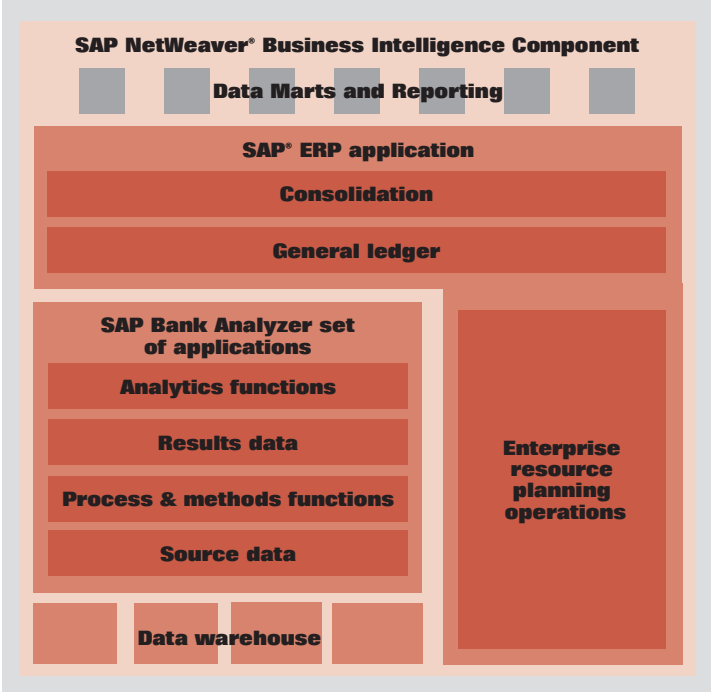


Figure 1: SAP Software for Financial and Management Accounting

ACCOUNTING STRATEGIES FROM SAP

Overview of Accounting Strategies

By evaluating customer requests, projects, and implementations, the following accounting strategies were identified. Each has a different functional scope.

- Group accounting – covers legal and management consolidation
- Centralized accounting – covers accounting tasks assigned to a central finance unit
- Decentralized accounting – covers the accounting tasks remaining in the central finance unit after certain accounting tasks, especially those related to financial products, have been assigned to the business lines
- Business line accounting – covers the accounting tasks assigned to business lines that handle financial products

Three of these strategies – centralized accounting, decentralized accounting, and business line accounting – may acquire additional complexity depending on whether they are implemented for a single legal entity or a group of legal entities, and whether they are to serve on a national level (for a banking network, for example) or on an international level (for an international banking group).

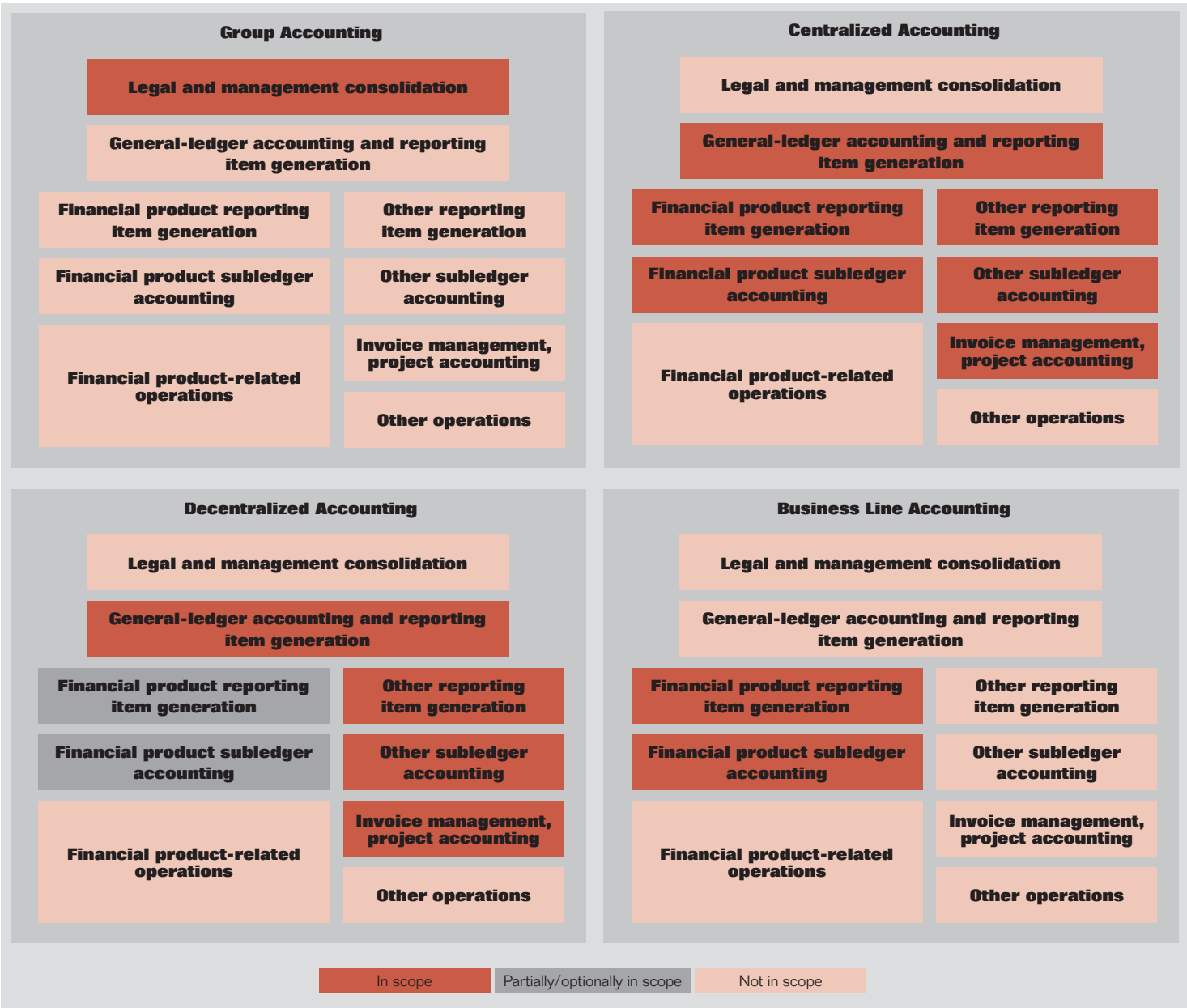


Figure 2: Functional Scope of Accounting Strategies

The following table gives a detailed overview of the functional scope of each accounting strategy.

FUNCTIONAL SCOPE	CONTENT	ACCOUNTING STRATEGIES			
		GROUP ACCOUNTING	CENTRALIZED ACCOUNTING	DECENTRALIZED ACCOUNTING	BUSINESS LINE ACCOUNTING
Operational accounting for financial products	<ul style="list-style-type: none"> ■ Nominal position management ■ Billing ■ Invoicing ■ Collection management ■ Write-down or write-off ■ Settlement ■ Matching 	Not included	Sourcing of transactions for position management	Optional sourcing of transactions for position management	Sourcing of transactions for position management
Valuation of financial product positions	<ul style="list-style-type: none"> ■ Cash-flow calculation ■ Credit-risk calculation ■ Accruals ■ Impairment ■ Key date valuation 	Not included	Optional	Not included	Optional
Operational accounting for nonfinancial products	Accounting entry generation for non-financial product-related transactions	Not included	Included	Included	Not included
Valuation of nonfinancial product positions	Accruals, impairment, and key date valuation of nonfinancial product-related positions	Not included	Included	Included	Not included
Hedge management	<ul style="list-style-type: none"> ■ Allocation ■ Documentation ■ Effectiveness tests ■ Valuation of involved positions 	Not included	Optional	Optionally included via mirror positions	Optional
Deferred tax calculation	Calculation of deferred tax amounts at key dates	Not included	Included	Included (for nonfinancial product subledger and aggregated for financial products)	Optional for financial products
Foreign exchange (FX) valuation	<ul style="list-style-type: none"> ■ FX position keeping <ul style="list-style-type: none"> - Dual-currency accounting - Multicurrency accounting ■ Calculation of amount in functional/reporting currency 	Not included	Included	Included	Included for financial products
Subledger accounting interpretation	<ul style="list-style-type: none"> ■ GAAP-dependent interpretation of: <ul style="list-style-type: none"> - Operational accounting - Valuation of positions - Hedge management - Deferred tax calculation - FX valuation 	Not included	Included	Optional	Included for financial products
Generation of additional financial statements	<ul style="list-style-type: none"> ■ Evaluation of items for: <ul style="list-style-type: none"> - Notes to financial statements - Cash-flow statement - Changes in equity 	Not included	Included	Included	Included for financial products
General-ledger (GL) accounting	<ul style="list-style-type: none"> ■ Valuation of GL positions and positions not covered by subledgers ■ GL closing ■ Corporate actions 	Not included	Included	Included	Not included
Branch consolidation	<ul style="list-style-type: none"> ■ Monitoring matching and clearing of interbranch positions ■ FX translation ■ Interunit eliminations ■ Elimination of interunit profit/loss 	Not included	Included	Included	Not included

FUNCTIONAL SCOPE	CONTENT	ACCOUNTING STRATEGIES			
		GROUP ACCOUNTING	CENTRALIZED ACCOUNTING	DECENTRALIZED ACCOUNTING	BUSINESS LINE ACCOUNTING
Group consolidation	<ul style="list-style-type: none"> ■ Monitoring matching and clearing of intragroup positions ■ FX translation ■ Capitalization and valuation allowances of assets and liabilities ■ Interunit eliminations ■ Elimination of interunit profit/loss ■ Consolidation of investments 	Included	Not included	Not included	Not included
Funds transfer pricing (FTP)	<ul style="list-style-type: none"> ■ Profit center accounting (PCA) <ul style="list-style-type: none"> - Suspense accounts for squaring - Management of funding positions - Internal interest calculation ■ Profitability analysis <ul style="list-style-type: none"> - Interest margin calculation - Evaluation of contribution after allocation of costs 	Not included	Included	Included: aggregated PCA or detailed PCA based on sourced FTP postings for financial products	Included for financial products
Cost accounting	<ul style="list-style-type: none"> ■ Cost element accounting ■ Cost center accounting ■ Internal cost allocation - PCA: <ul style="list-style-type: none"> Charging internal prices for internal services between centers and entities - Profitability analysis: <ul style="list-style-type: none"> Calculating internal costs for external product and service offerings 	Not included	Included	Included	Not included
Reporting	<ul style="list-style-type: none"> ■ Management of data dictionary ■ Management of reporting forms ■ Generation of reconciliation reports ■ Generation of management reports ■ Generation of external reports ■ Generation of ad hoc reports ■ Data mining 	Included for reporting on subgroup and group levels	Included for reporting on legal entity level	Included for reporting on legal entity level	Included for reporting financial products on business line level

Group Accounting Strategy

Business Scope

The accounting activities in the group accounting strategy are usually performed by a central finance unit or a dedicated unit for group consolidation. The strategy focuses on financial and management accounting on the group and subgroup levels, and covers legal and management consolidation and related reporting on those levels as well. Functions this strategy must support include interunit clearing and elimination, elimination of interunit profit or loss, FX translation, and consolidation of investments, as well as monitoring the matching and clearing of intragroup positions of financial products and nonfinancial product positions.

Legal consolidation must be implemented mainly to support compliance with internationally applied GAAPs such as international financial reporting standards (IFRS) and U.S. GAAP.

The challenges of this strategy are mainly related to the matching of interunit positions and transactions, which is driven by the complexity of the products covered (for example, the derivatives the bank is using) and the number of positions (such as numerous contracts for intragroup funding and risk management). Typical candidates for this strategy are national and international banking groups. Because this strategy focuses on the group and subgroup levels exclusively, it can be used to complement the accounting strategies focusing on the legal entity and business line levels.

Functional Architecture

Implementation of the group accounting strategy requires the following SAP software:

- The consolidation functionality and strategic enterprise management functionality of SAP ERP
- SAP NetWeaver BI

The data warehousing and reporting functions of SAP NetWeaver BI can be applied. There are no standard SAP functions available for monitoring the matching and clearing of intragroup positions for financial products. However, a project-based add-on for SAP software or a third-party product integrated with SAP NetWeaver BI may be used.

The information required for consolidation is supplied to SAP NetWeaver BI. SAP ERP uses this data to perform legal and management consolidation. The results are stored in data marts provided by SAP NetWeaver BI especially tailored for the purpose. The required financial statements are generated by applying specific report forms to these data marts.

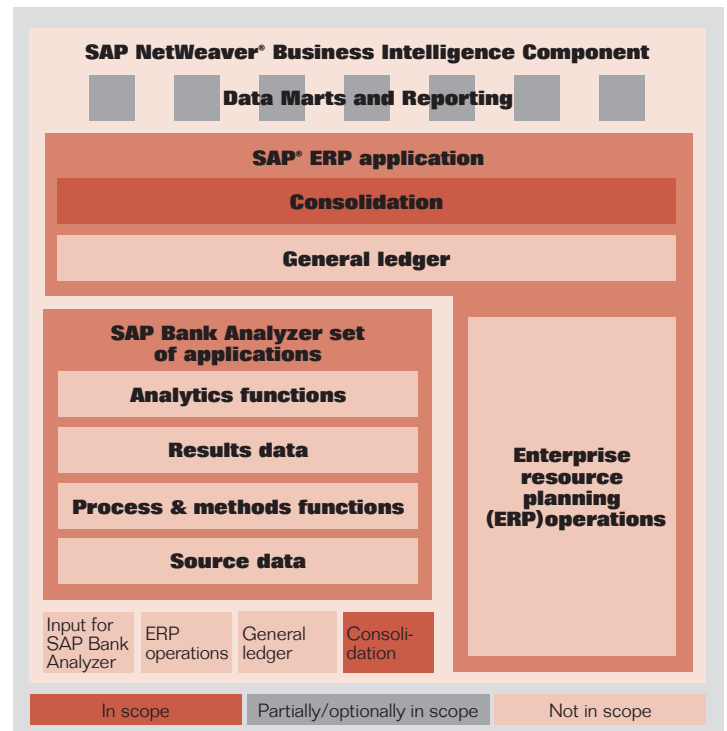


Figure 3: Architecture for the Group Accounting Strategy

Centralized Accounting Strategy

Business Scope

The accounting activities in the centralized accounting strategy are performed by a central finance unit. The functional scope focuses on integrated financial and management accounting on the legal entity level and includes operational accounting for nonfinancial product transactions, valuation of nonfinancial product positions, FX valuation, deferred tax calculation, sub-ledger accounting interpretation, general-ledger accounting, generation of additional financial statements, branch consolidation, FTP (implemented for PCA and optional for profitability analysis), cost accounting, and reporting. In German-speaking countries, management accounting is often concentrated in a separate central unit called “controlling.”⁹ When that is the case,

9. The reason for this is the historic development of the finance function in these countries. Finance has produced figures based on a local GAAP that focuses on creditor protection and is influenced by tax considerations and has been, therefore, ill-suited for management accounting. Hence, a separate function, “controlling,” has developed that focuses on management accounting.

FTP (implemented for profitability analysis), cost accounting, and the corresponding reporting are allocated to that unit.

Hedge management activities and the valuation of financial products are often allocated to the responsible business lines and the results are sourced from the business lines back to the central finance unit. Alternatively they may be assigned in part to the central finance unit. Although operational accounting for financial products is not included in the strategy, the information it supplies serves as the basis for functions that are in scope. For that reason, operational accounting information must be supplied in order to mirror inventory management.

The financial accounting functions must be implemented to support compliance with internationally applicable accounting standards, such as IFRS and U.S. GAAP, and in many cases with the GAAP governing the legal entity in its domicile country.

In realizing this strategy, the main challenge for banks is centralizing the subledger accounting for financial products. Business models for retail customers face the challenge of processing a huge number of transactions for many contracts. Business models for commercial customers must cope with the complexity of the financial products and their nonstandard conditions and transactions. Business models for investment banking must deal with the additional challenge of rapid changes in the product portfolio. Universal banks must cope with all these challenges.

To successfully answer these challenges, the centralized accounting strategy is deployed mainly in banks with a regional focus, a focus on certain customers, or a focus on a restricted product portfolio. Typical examples include independent regional retail banks, head institutions of banking networks, mortgage banks, export credit agencies, captive finance banks, and IT centers that service the banking networks of local banks. Because this accounting strategy focuses on the legal entity level, it can be used to complement the group accounting strategy, which focuses on the group and subgroup level.

Functional Architecture

Implementation of the centralized accounting strategy requires the following SAP software:

- SAP Bank Analyzer
 - SAP Accounting for Financial Instruments application
 - Management accounting and profitability analysis functionality
 - Extensive implementation of the source and results data, the process and methods functions, and the analytics functions
- The ERP operations functionality of SAP ERP
- The general-ledger functionality of SAP ERP
- SAP NetWeaver BI

To provide valuation of financial products and FTP, operational transactions and master data must be supplied to SAP Bank Analyzer. This is true for contracts based on agreed-on amortization schedules or for contracts representing OTC options. The valuation for these contracts is marked to model. This is also true for instruments which are usually marked to market. Although SAP Bank Analyzer can value most of these financial products, contracts and instruments relating to investment banking are often valued by the applications that support trading, operations, or the middle office. One reason for this is to prevent even small valuation differences from occurring between the business lines and accounting. Another reason is to minimize implementation and maintenance efforts for complex valuation functions. This especially appeals to the trading and investment banking business lines, where rapid changes in the product portfolio are inherent to the business. FTP for contracts based on agreed-on amortization schedules is calculated based on the cash flow of the contracts. Instruments are usually allocated to portfolios where market risks are allowed. FTP is then calculated for the liquidity gap in these portfolios based on the volume of the gap per instrument position or contract.

If hedge management activities are assigned to a business line, these activities are also often allocated to the same applications that support trading, related operations, or the related middle office. If hedge management is assigned to the central finance unit, SAP Bank Analyzer can support operational hedge management with a hedge management workplace and hedge accounting. SAP Bank Analyzer can calculate deferred tax for financial products on a detailed position level, using as a basis either a sourced tax value or the valuation for the local GAAP in SAP Bank Analyzer. FX valuation in SAP Bank Analyzer is based on multicurrency accounting. This means that gain or loss in one currency is based on the overall FX position¹⁰ in that currency rather than on individual FX transactions.

The subledger accounting interpretation of SAP Bank Analyzer is one core function in this accounting strategy. Another important function generates information for the financial product subledger to be used in additional financial statements. Matching the interbranch and interapplication positions of financial products (held in suspense accounts) is considered part of operational accounting and for that reason is not provided by SAP Bank Analyzer. Those functions should be performed by an application that can send its postings to SAP Bank Analyzer. SAP ERP covers operational accounting for the transactions of nonfinancial product transactions and positions, valuation of nonfinancial product positions, and cost accounting.

The deployment of the general-ledger functionality of SAP ERP for this accounting strategy is based on a “thin” general ledger approach: only aggregated postings are sent to it. The main purpose of a thin general ledger is to provide a control ledger that allows a daily trial closing. Additionally the general ledger has to support the closing process and corporate actions. In this approach, SAP Bank Analyzer performs the aggregation for the financial product subledger; other subledgers – for example, those for fixed asset, accounts payable, and accounts receivable – perform the aggregation for their subledger postings. Parallel

ledgers and a multidimensional general-ledger key can be implemented using dimensions such as general-ledger account, product, profit center, partner company, and partner center. Branch consolidation functions are supported as well.

SAP NetWeaver BI generates all the financial statements required for this accounting strategy. The reporting is based on the data marts SAP NetWeaver BI provides, which are especially tailored for the different accounting areas. SAP ERP and SAP Bank Analyzer supply the data marts with data.

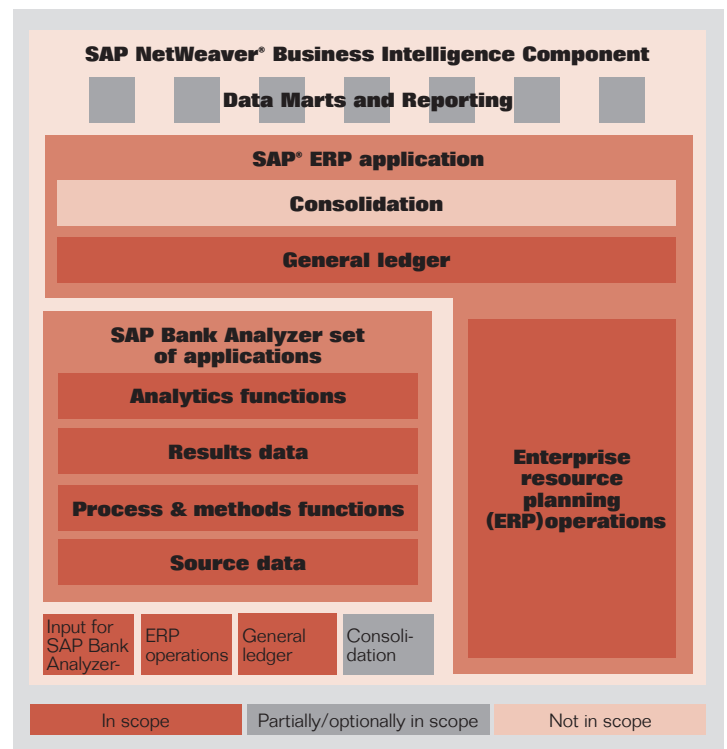


Figure 4: Architecture for the Centralized Accounting Strategy

10. Sometimes there are several FX positions per currency: one for the nontrading area and one for each trading portfolio that is allowed to run FX risks.

Decentralized Accounting Strategy

Business Scope

In the decentralized accounting strategy, some accounting functions are assigned to business lines, while the rest remain assigned to a central finance unit. Focus is on integrated financial and management accounting on the legal entity level.

The functional scope covered by this strategy is restricted. Accounting functions typically assigned to business lines are: valuation of financial products, deferred tax calculation for financial products on a detailed level, and FTP, although FTP could remain a task of the central finance unit. Accounting functions usually performed by the central finance unit in the decentralized accounting strategy include operational accounting for nonfinancial product transactions, valuation of nonfinancial product positions, deferred tax calculation on an aggregated level, FX valuation, general-ledger accounting, generation of additional financial statements, branch consolidation, PCA, cost accounting, and the corresponding reporting. Accounting interpretations for the financial product subledger and hedge management and hedge accounting may or may not remain in the central finance.

Financial accounting must be implemented to support compliance with internationally applied accounting standards such as IFRS and U.S. GAAP and in many cases with the GAAP governing the legal entity in its domicile country.

This strategy empowers the business lines and reduces the centralized tasks, with the main challenge being to guarantee consistency and compliance with GAAP rules for both centralized and decentralized accounting functions. This strategy is appropriate for banks whose business lines have a high level of autonomy. Typical examples are large national universal banks and international banking groups. Because this accounting strategy is implemented on the legal entity level in one, several, or all legal entities of a group, it can be used to complement the group accounting strategy, which focuses solely on the group and subgroup levels.

Functional Architecture

Implementation of the decentralized accounting strategy requires the following SAP software:

- SAP Bank Analyzer
 - SAP Accounting for Financial Instruments
 - Management accounting and profitability analysis functionality
 - Extensive implementation of results data and analytics functions
 - Optional implementation of the source data and the process and methods functions
- The ERP operations functionality of SAP ERP
- The general-ledger functionality of SAP ERP
- SAP NetWeaver BI

When accounting functions are decentralized per business line, SAP Bank Analyzer usually does not need to be supplied with operational transactions for position management and financial product master data, but must be supplied with detailed postings. However, it does need the transactions and the master data to cover the subledger accounting interpretation for financial products. Alternatively the subledger accounting interpretation can be performed by operational applications for financial products if they have subledger functions or by specialized third-party products that combine middleware and accounting features, instead of by SAP Bank Analyzer.

If hedge management and hedge accounting is in scope, the SAP Accounting for Financial Instruments application must be integrated with the source data and the process and methods functions of SAP Bank Analyzer. In addition, master data and business transactions for all items involved in hedging operations must be supplied to the source data.

The main focus for SAP Bank Analyzer in the decentralized accounting strategy is to generate additional financial statements for financial products, detailed balances for financial products, and a unified general-ledger key for financial product postings. It also aggregates the financial product subledger postings. To accomplish this, detailed financial product postings must either be supplied to or stored with the results data so that the analytics functions can access them.

To ensure comprehensive FTP analysis for PCA in this strategy, one of two methods may be used:

- Represent FTP in the form of supplied internal postings on a detailed level
- Implement management accounting functions for financial instruments for the source data; implement process and methods functions of SAP Bank Analyzer; supply master data and business transactions for all related items

A simplified form of FTP on the general-ledger key level could be implemented as a project-based add-on for the general-ledger functionality of SAP ERP.

Functions such as deferred tax calculation on an aggregated level, FX valuation, and the nonfinancial product part of PCA are allocated to the SAP ERP software. Deferred tax calculation on the aggregated level can be performed by manual postings or by a project-based add-on for SAP ERP.

The setup and scope of operational accounting for nonfinancial product transactions and positions, valuation of nonfinancial product positions, cost accounting, general-ledger accounting, and branch consolidation are the same for the decentralized accounting strategy as they are for the centralized accounting strategy. For details about their implementation in SAP ERP, please refer to the centralized accounting strategy description in this paper.

SAP NetWeaver BI generates all the financial statements required for this accounting strategy. The reporting is based on the data marts SAP NetWeaver BI provides, which are especially tailored for the different accounting areas. SAP ERP and SAP Bank Analyzer supply the data marts with data. However, if they cannot provide all required data because some accounting functions were decentralized, additional applications must be accessed to get that data.

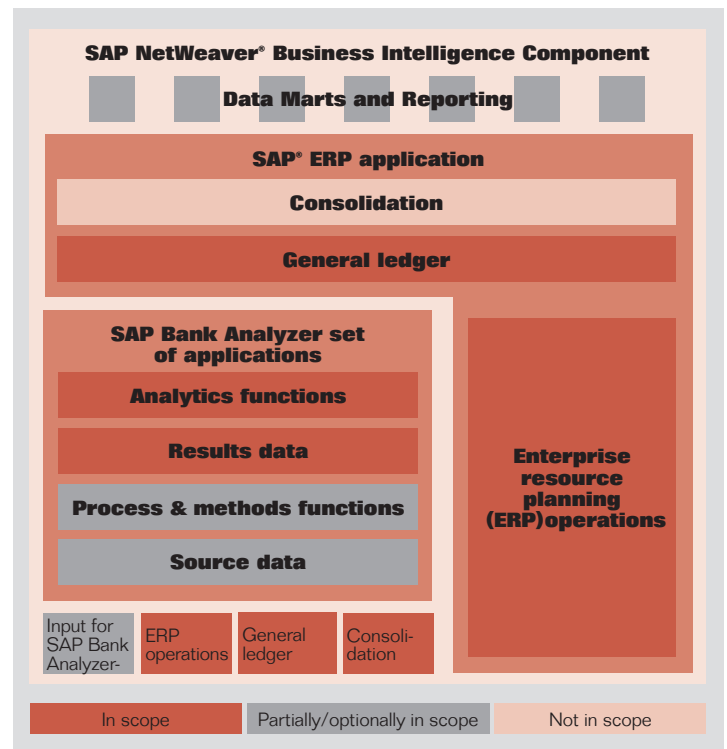


Figure 5: Architecture for the Decentralized Accounting Strategy

Business Line Accounting Strategy

Business Scope

The business line accounting strategy assigns the accounting activities for financial products to business lines, with each business line set up as a decentralized accounting unit. A subledger for financial products is provided and focus is on integrated financial and management accounting for a business line. Functions falling within the scope of this strategy include FX valuation for financial products, subledger accounting interpretation for the financial product subledger, the generation of additional financial statements for financial products, and FTP.

Hedge management and valuation of financial products may be included or supplied from operations. Deferred tax calculation for a financial product may be included or shifted to the central finance unit. Operational accounting for financial products is not included, but because it serves as the basis for functions that are, business transactions and master data for financial products must be supplied.

The financial accounting functions are deployed in compliance with internationally applied accounting standards such as IFRS and U.S. GAAP and in many cases with the GAAP governing the legal entity in its domicile country to which the business line is attached.

The challenges of this accounting strategy mainly depend on the business model of the individual business line. Business models for retail customers face the challenge of processing huge numbers of transactions for many contracts. Business models for commercial customers must cope with the complexity of the products and their nonstandard conditions and transactions. Business models for investment banking must deal with the additional challenge of rapid changes in the product portfolio.

The strategy can be implemented for a business line in one, several, or all legal entities to which the business line is attached and is appropriate for business lines that have a high level of autonomy, for example, business lines in tier-one banks. Because

this accounting strategy also focuses on the legal entity level, it can be used to complement decentralized accounting on the legal entity level and for the group accounting strategy, which focuses on group and subgroup levels.

Functional Architecture

Implementation of the business line accounting strategy requires the following SAP software:

- SAP Bank Analyzer
 - SAP Accounting for Financial Instruments
 - Management accounting and profitability analysis functionality
 - Extensive implementation of the source and results data, the process and methods functions, and the analytics functions
- The general-ledger functionality of SAP ERP
- SAP NetWeaver BI

The setup and scope for a financial product subledger is nearly the same for the business line accounting strategy as it is for the centralized accounting strategy. Please refer to the description of the centralized accounting strategy for details. One potential difference could be a shift of the deferred tax calculation to the central finance unit. In that case, no deferred tax calculation would be implemented in the process and methods functions of SAP Bank Analyzer.

For the business line on the legal entity level, SAP ERP provides an overview ledger for financial products for control and reconciliation purposes.

Generation of financial statements is restricted to the financial product subledger and is performed by SAP NetWeaver BI. The reporting is based on the data marts SAP NetWeaver provides for the different accounting areas, with emphasis on financial products. SAP Bank Analyzer supplies the data for these data marts.

BEST PRACTICES AND RECOMMENDATIONS FOR SETUP

Organizational Setup

Multi-GAAP Accounting

The proposed SAP software-based architecture supports multi-GAAP accounting. However, to keep the effort for implementation, maintenance, and operations within reasonable limits, the number of parallel ledgers to cover multiple GAAPs should be restricted. It is especially important to restrict parallel ledgers in SAP Bank Analyzer, because the effort for implementation, maintenance, and operations is higher there than compared with SAP ERP or SAP NetWeaver BI. As a rule of thumb, the number of accounting standards implemented in SAP Bank Analyzer should be less than or equal to the number of accounting standards implemented in SAP ERP, which should be less than or equal to the number of GAAPs covered by reports in SAP NetWeaver BI.

Suppose two GAAPs are implemented in SAP Bank Analyzer: (1) IFRS as the leading GAAP, and (2) the local GAAP of country A. If there is no great difference between local GAAP rules in countries A and B, users should consider not implementing the local GAAP of country B in SAP Bank Analyzer which is only used to produce local external reports. The additional information required for local reporting in GAAP B can be produced in two ways:

- Duplicate local GAAP A postings between SAP Bank Analyzer and SAP ERP, store the duplicated postings for local GAAP B in a separate ledger in SAP ERP, and make adjustments to achieve compliance with the local GAAP B using the SAP ERP general-ledger functions, customer-specific add-ons, or manual postings.
- Use SAP NetWeaver BI to combine all available information across all already available GAAPs to generate a hybrid report that meets the local reporting requirements for GAAP B.

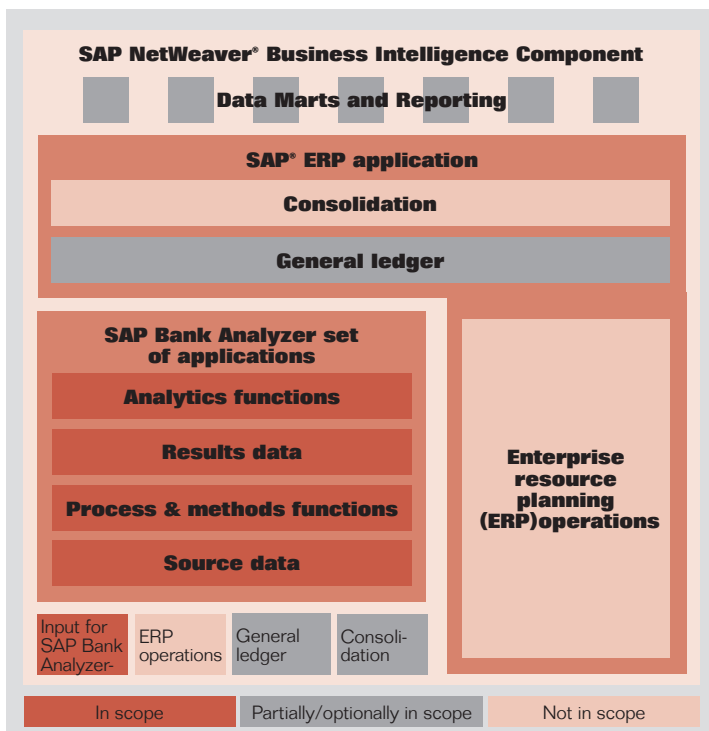


Figure 6: Architecture for the Business Line Accounting Strategy

Foreign Branches

Modeling foreign branches as separate legal entities is recommended to provide separate reporting and a decoupled closing process. However, this requires consecutive consolidation of fictitious entities (the bank without its branches and each of its branches separately) to get the figures of the real legal entity. Because there is a trend to use a multidimensional general-ledger key instead of a one-dimensional general-ledger account number, manual consolidation is not efficient since the number of manual postings to integrate the branch with its parent increases exponentially with the number of dimensions in the general-ledger key.

Another challenge is that, for certain GAAPs such as International Accounting Standards 21 (IAS 21), foreign operations must potentially account for use of a different functional currency than the legal entity itself. This requires separate financial statements and an FX translation for the financial statements of those foreign operations.

To support the branch consolidation activities, one of the following implementations should be used:

- The strategic enterprise management functionality of SAP ERP based on SAP NetWeaver BI
- The enterprise controlling consolidation functionality integrated directly with the general-ledger functionality, both in SAP ERP

The strategic enterprise management functionality of SAP ERP based on SAP NetWeaver BI is not as efficient at branch consolidation and should be used only if it is already part of the architecture to cover group consolidation.

Management Accounting and GAAP

To provide a coherent basis for segment reporting, management accounting (especially PCA) should be set up in compliance with the leading GAAP (mainly IFRS or U.S. GAAP). This will ensure that the figures used for external reporting and the figures used internally for steering purposes agree. This is especially impor-

tant for all listed banks. Moreover, the ledgers in the leading GAAP should be the only ones used for control and steering purposes. All other ledgers should be set up only if necessary (see the previous remarks on multi-GAAP accounting) and should be used solely to generate reports for external reporting (statutory, regulatory, or tax reporting).

Subledger Setup Financial Products

Business transactions in SAP Bank Analyzer are processed in batches. All allowed business transactions and rules must be implemented as customizing settings, with no manual interference intended for daily and period-end production. For that reason, SAP Bank Analyzer should focus on financial products whose business transactions and processing rules can be completely described, allowing them to be automated. For financial products for which this is not feasible, the accounting operation should be performed with another application that supplies SAP Bank Analyzer with the postings that it uses to generate additional financial statements (for example, notes), aggregate subledger postings, and derive common general-ledger keys.

To leverage SAP Bank Analyzer features and functions in an optimal way, business transactions and the master data of the financial products should be described in one standardized object model that covers financial accounting in all GAAPs and management accounting. The same approach should be applied to the accounting interpretation, which has to be set up according to all GAAPs covered. Reuse of the interpretation of similar rules across all GAAPs should be a goal. The SAP business content and the packaged solutions should be used as a basis for that endeavor.

Aggregation of Current and Saving Accounts

For financial accounting and PCA of contracts – such as current accounts and saving accounts (nonmaturing products¹²) for which the valuation is based on the actual balance at key dates –

12. This comprises products for which the customer can choose any desired amortization schedule or for which the maturity is not specified or determined. Products with agreed-on amortization schedules and prepayment options in which the prepayment causes a penalty or is explicitly calculated and charged to the customer are not included in this definition.

it is unnecessary to process operational transactions and master data on a detailed level and unnecessary to post the results on a detailed level. FTP for nonmaturing products is usually calculated based on the average effective funds during a calculation period.¹³ Aggregation is possible for all these calculations and recommended for many contracts. This is of special importance for banks that focus on retail banking. For aggregation functions such as aggregation of detailed movements, aggregated position management and generation of aggregated postings are required.

For profitability analysis focusing on the account or contract level, the average effective funds for each contract or account must be supplied on a monthly basis to or be generated by SAP Bank Analyzer. In SAP Bank Analyzer service contracts are represented by applying the same basic object model and business transactions as those used for current accounts. Consequently, the same rationale regarding aggregation applies for both.

FX Position Management

Keeping FX positions in the financial product subledger should use a multicurrency accounting approach. It is also recommended to manage FX positions rather than each FX transaction. It is a best practice to set up several FX positions – for example, one for treasury reflecting nontrading activities and one for each portfolio allowed to run FX risks. Each subledger (including subledgers for nonfinancial product transactions and positions) should be set up with its own FX valuation to provide better transparency and easier reconciliation with the overall FX position and FX valuation results.

13. Common practice for FTP of nonmaturing products is to calculate the internal interest income and expenses and hence the margin based on an artificial replication portfolio, which indicates a similar behavior regarding interest rate changes and has the same currency. Each unit (for example, €1.00) is translated into an artificial cash flow which is assessed based on the cash flow of this replication portfolio. This method makes it possible to apply to nonmaturing products the same rationale used for maturing products. However, this calculation is based either on a detailed or an aggregated level of the average effective funds instead of being based on detailed cash flows per contract. An average effective fund contains both the average amount of principal and the interest accrued during the calculation period.

ERP Operations

Subledgers for accounting for nonbanking-specific activities may be set up either separate from or integrated with the operational management of basic transactions. If set up separately, flexible accounting-specific processing in solutions such as SAP Bank Analyzer could be leveraged. When integrated with operational management, an integrated ERP scenario is established.

Because this operational management and its accounting are not specific to the banking industry, the integrated ERP scenario is recommended. SAP ERP supports cross-industry best practices¹⁴ that can be leveraged directly. To support automated processes, accounting-specific functions may have to be combined with other functions. In SAP ERP this is straightforward. For example, functions for material management and sales and distribution can be leveraged to automate internal allocation of expenses within and across legal entities (intragroup invoicing) for internal services. Activities in nonbanking-specific accounting may include: accounts payable, accounts receivable (nonfinancial product related), asset accounting, project accounting, and cost accounting.

General Ledger Setup

The role of the general-ledger in the proposed architecture mainly serves control purposes, although it supports management of general-ledger positions, closing activities, and corporate actions. SAP NetWeaver BI produces the financial statements. The general ledger should support a daily trial closing and provide a quick overview of the legal entity level both before and after branch consolidation. This can be achieved by setting up a multidimensional general-ledger key comprising not only the general-ledger account number, but the product, profit center, partner company, partner center, and movement type as well. The general-ledger functionality in SAP ERP supports a multidimensional general-ledger key.

14. Cross-industry best practices comprise, for instance, object modeling, processing rules, a data dictionary, and reporting forms for accounts payable, accounts receivable, asset accounting, project accounting, and cost accounting.

There are technical limits to the number of entries a main table¹⁵ can have. To keep the number of postings in a table within allowed limits, the postings sent to SAP ERP should be aggregated on a general-ledger key level, which suggests a thin general ledger approach. To eliminate rounding differences of FX valuations in all subledgers, an additional FX valuation should be set up on the general ledger level. A best practice is to implement a uniform general-ledger key set for all GAAPs.

Operations Setup

Shared-Services Organizations

When an accounting strategy is rolled out to several business lines within a bank or banking group, to several legal entities of a banking group, or throughout a banking network, how to set up operations most efficiently becomes an issue. Shared-services organizations are a way to leverage economy of scale and economy of scope for back-office functions, and this includes financial

and management accounting. Typical areas covered by a shared-services organization (SSO) are the functions described in this paper as being part of ERP operations. However, the financial product subledger and general-ledger accounting tasks in a bank are also likely candidates because of their complexity. The economy of scale comes from running accounting activities for several entities on the same platform. The economy of scope comes from concentrating the complex, required know-how in a center of excellence. The tasks allocated to the SSO should cover IT operations for the solutions as well.

Sharing Activities

Allocating activities for financial and management accounting as shown in the following table will help increase overall operational efficiency.

	Execute Daily Trial Closing	Execute Periodic Full Closing	Support Auditing	Implement New Financial Product	Change Master Referentials*	Implement New Accounting and Reporting Rules
Activities Within SSO	<ul style="list-style-type: none"> ■ Process business transactions and postings ■ Provide reconciliation reports and reporting data marts 	<ul style="list-style-type: none"> ■ Process business transactions and postings ■ Provide reconciliation reports and reporting data marts 	<ul style="list-style-type: none"> ■ Produce specific data marts ■ Explain data and processing in the applications to auditors 	<ul style="list-style-type: none"> ■ Define leading GAAP requirements ■ Implement all adaptations ■ Test according to leading GAAP 	<ul style="list-style-type: none"> ■ Define leading GAAP requirements ■ Implement all adaptations ■ Test according to leading GAAP 	<ul style="list-style-type: none"> ■ Leading GAAP <ul style="list-style-type: none"> - Define rules - Implement adaptations - Test adaptations ■ Local requirements <ul style="list-style-type: none"> - Implement adaptations
Activities Outside SSO	<ul style="list-style-type: none"> ■ Provide business transactions and postings ■ Reconcile results with source data ■ Produce reports ■ Analyze results 	<ul style="list-style-type: none"> ■ Provide business transactions and postings ■ Reconcile results with source data ■ Produce reports ■ Analyze results 	<ul style="list-style-type: none"> ■ Define information requirements ■ Produce specific reports ■ Explain data and processing up to sourcing and reports to auditors 	<ul style="list-style-type: none"> ■ Provide product details ■ Define local requirements ■ Provide source data ■ Test according to local requirements 	<ul style="list-style-type: none"> ■ Provide new master referentials ■ Define local requirements ■ Test according to local requirements 	<ul style="list-style-type: none"> ■ Local requirements <ul style="list-style-type: none"> - Define rules - Test adaptations

*New organizational structure (center or entity), new general-ledger key

15. The data volume in a totals record table of the new general ledger should not exceed 5–6 million entries. See SAP Note 820495.

BENEFITS OF THE PROPOSED SAP SOFTWARE-BASED ARCHITECTURE

Basic Rationale for Shared Services

The SSO should act as an information factory to supply all requirements and as a center of excellence for the leading GAAP. Responsibility for exact knowledge of local requirements, production of reports, and analysis of results should not be allocated to an SSO, but distributed throughout the organization. The costs necessary to develop know-how in the SSO to cover these areas would be too high and decrease its overall efficiency.

In order to be able to set up efficient SSO operations, accounting must be standardized – especially for the leading GAAP – for all entities involved and the accounting strategy must be set up consistent with the description, recommendations, and best practices mentioned in this paper.

Business Benefits

From a top-down view, the SAP software-based architecture proposed in this paper promotes harmonization of accounting methods and accounting processes within a bank or banking group. To expedite groupwide harmonization, standardization of the following is recommended: the chart of accounts, the general-ledger key, the valuation methods, the accounting rule interpretation, and the approach used for management accounting. The result is heightened compliance to internal and external accounting rules. Because the proposed architecture integrates financial and management accounting in one platform, it is much easier to achieve horizontal reconciliation, one-voice communication of results to management, and consolidation of information for internal steering purposes and communication to stakeholders.

From an organizational point of view, the architecture facilitates the implementation of accounting competence centers and accounting shared services. This helps cluster scarce and valuable business know-how, improve quality, and improve process control. Operational risks in accounting are reduced as a result. Moreover, business process costs can be reduced¹⁶ and the resources freed-up shifted to strategic finance topics such as improved support of decision-making processes.

On a functional level, this architecture provides a single source of truth by supporting a harmonized model of source, result, and reporting information across entities, business lines, and accounting functions. This reduces vertical reconciliation efforts, with the information available for use in risk control as well. The architecture uses aggregated postings in a thin general ledger and provides detailed reporting from a data warehouse

16. According to The Hackett Group, companies with shared services organizations for finance are more cost efficient by more than 45% (see Tom Olavi Bangemann, *Shared Services in Finance and Accounting*, Gower Publishing Limited [2005], p. 47).

containing detailed master data, detailed postings, and information based on complex rules. This approach leads to reduced restatements caused by internal reorganization.¹⁷ Flexible reporting is based on detailed keys on a very granular level (contract, position, or trade level), and a multidimensional view of the accounting figures is possible. By supporting a daily trial closing – which minimizes unexpected results at the end of the month – the architecture promotes fast closes. It provides full auditability for all information sourced, generated, and reported by the solution.

The architecture delivers SAP customer know-how in accounting as best-practice guidelines. The solution leverages SAP ERP and provides preconfigured content for consolidation, general-ledger accounting, ERP operations, and financial product accounting with SAP Bank Analyzer business content. The SAP Financials for Banking package and the SAP Accounting of Financial Instruments for Banking package are also available, which deliver preconfigured accounting functionality and implementation accelerators. This bundle of products and services reduces implementation efforts and mitigates implementation risks.

17. Only changes that effect the aggregated general-ledger key need to be posted. Other changes are handled by running an updated report on the data warehouse.

IT Benefits

From a top-down view, the SAP software-based architecture facilitates the consolidation of IT operations, maintenance, and support. This is achieved through consolidation of applications, which leads to a reduction of interfaces, and successive consolidation of hardware.

From an organizational point of view, the architecture facilitates the implementation of IT competence centers and IT shared services for the applications and hardware that support accounting. The implementation of these organizational measures can be supported by existing SAP know-how or by tapping into the know-how from the global market. The measures increase IT efficiency, improve IT quality, and reduce IT operational risks.

On a functional level, the main benefit for IT is that SAP offers data warehousing and analyzer functionality in one place. Both are delivered with the integration functionality in the SAP Accounting of Financial Instruments for Banking package, with process control features and functions built in. Data warehousing functionality is provided with the source data and results data of SAP Bank Analyzer, and in SAP NetWeaver BI. Analyzer functions are provided with the SAP Bank Analyzer set of applications.

Requirements for controlling risk are supported by the SAP Basel II application and the SAP Limit Management application. However, the overall process control framework allows the use of third-party analyzers. The enterprise service-oriented architecture (enterprise SOA) provides the basis for the SAP banking process platform of which SAP Bank Analyzer is a part. The scalable solution SAP offers comes with many elements that are preconfigured but not hard-coded. The openness of enterprise SOA provides for the coexistence of heterogeneous technologies.

SAP is a strong partner in IT and a sustainable vendor. The architecture described in this paper leverages know-how in accounting and other analytical areas that have been implemented with SAP ERP in over 600 banks in 60 countries and with SAP Bank Analyzer by 58 customers in 22 countries. Overall, the SAP software-based architecture can be a significant factor in increasing the efficiency and effectiveness of IT in its efforts to support accounting.

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