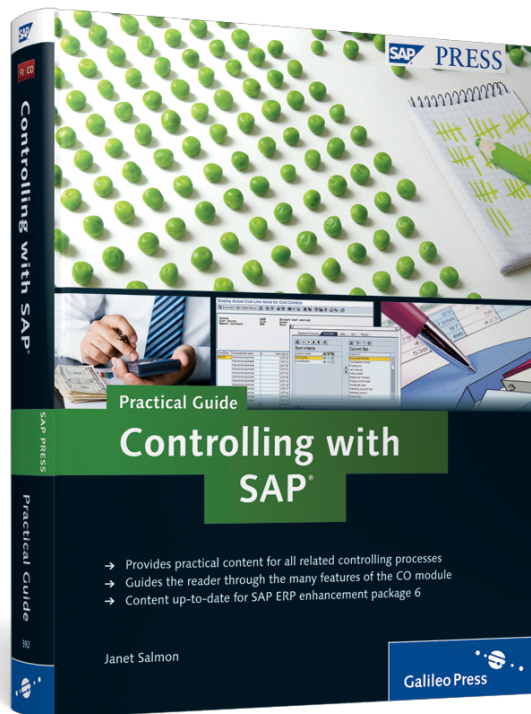


Janet Salmon

Controlling with SAP® – Practical Guide



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Contents at a Glance

1	Introduction	25
2	Reporting	51
3	Master Data Owned by Controlling	89
4	Master Data Where Controlling Is a Stakeholder	143
5	Planning and Budgeting	201
6	Actual Postings	257
7	Period Close	325
8	Reporting in SAP NetWeaver BW and SAP BusinessObjects	387
9	Master Data in a Multisystem/Shared Service Environment ...	427
10	Planning in SAP NetWeaver BW or SAP SEM	457
11	Allocations Using SAP Cost and Profitability Management ...	497
12	Period Close Using SAP Financial Closing Cockpit	527

Contents

Preface	15
---------------	----

1 Introduction 25

1.1 Basic Controlling Functions	28
1.1.1 Goals of Controlling	29
1.1.2 Cost Accounting in the United States	31
1.1.3 Standard Costs and Actual Costs	32
1.1.4 Investment and Project Controlling	32
1.1.5 Lean Accounting	33
1.2 Essential Record Keeping Functions	33
1.2.1 Record Keeping by Cost Center	35
1.2.2 Record Keeping by Order	38
1.2.3 Record Keeping by Project	39
1.3 Managing Close and Valuation Processes	40
1.3.1 Valuation of Goods Movements	40
1.3.2 Work in Process	41
1.3.3 Scrap	41
1.3.4 Work in Process for Projects	42
1.4 Preparing Budgets and Planning	43
1.4.1 Driver-Based Cost Planning	43
1.4.2 Driver-Based Cost Planning Between Cost Centers	45
1.4.3 Budgeting	46
1.5 Process Analysis and Internal Controls	47
1.5.1 Master Data Controls	47
1.5.2 Workflow	48
1.5.3 Process Controls	48
1.6 Summary	49

2 Reporting 51

2.1 Cost Center Line Items	52
2.1.1 Classic Cost Center Line Item Report	52
2.1.2 Simplified Cost Center Line Item Report	59
2.1.3 Totals Records for Cost Centers	61

2.2	Order Line Items	62
2.2.1	Classic Order Line Items	63
2.2.2	Simplified Order Line Items	65
2.3	Product Costs: Itemization	65
2.3.1	Classic Reports for Product Cost Reporting	67
2.3.2	Simplified Reports for Product Cost Reporting	70
2.4	Product Costs: Cost Objects	72
2.4.1	Product Cost by Order	72
2.4.2	Product Cost by Period	74
2.4.3	Product Costs by Sales Order	76
2.5	Material Ledger	77
2.6	Profitability Analysis Reports	80
2.7	Summary	87

3 Master Data Owned by Controlling 89

3.1	How to Set Up Cost Centers	90
3.1.1	Responsibility for a Cost Center	92
3.1.2	Embedding the Cost Center Design in SAP ERP	93
3.1.3	Ensuring that Cost Center Expenses Are Handled Correctly	95
3.1.4	Cost Center Hierarchies	97
3.1.5	Enterprise Organization	102
3.1.6	Reporting of Cost Center Master Data	103
3.2	Internal Orders	105
3.2.1	Internal Orders and Cost Centers	108
3.2.2	Settlement Rules for Internal Orders	108
3.2.3	Statistical Internal Orders	110
3.2.4	Order Groups	111
3.2.5	Reporting Order Master Data	112
3.3	Statistical Key Figures	114
3.3.1	Statistical Key Figure Groups	117
3.4	Activity Types	117
3.4.1	Direct and Indirect Activity Allocations	120
3.4.2	Settings for Activity Price Calculation	121
3.4.3	Activity Type Groups	122
3.4.4	Reporting Activity Type Master Data	122
3.5	Secondary Cost Elements	123

3.5.1	Cost Element Groups	127
3.5.2	Reporting on Cost Element Master Data	128
3.6	Product Cost Collectors	130
3.7	Cost Object Hierarchies	132
3.8	Maintenance Issues	134
3.8.1	Time-Dependent Fields	135
3.8.2	Status Management	136
3.9	Change Requests for a SOX-Compliant Master Data Process	137
3.10	Summary	141
4	Master Data Where Controlling Is a Stakeholder	143
4.1	Material Masters	144
4.1.1	Basic View	146
4.1.2	Accounting View	147
4.1.3	Costing Views	151
4.1.4	MRP View	154
4.1.5	Sales View	154
4.1.6	Batches	155
4.2	Customer Masters	156
4.3	Bills of Material	158
4.3.1	Quantity Definition	161
4.3.2	Co-Products and By-Products	161
4.3.3	Recursive BOMs	164
4.3.4	Configurable BOMs	165
4.4	Routings	168
4.4.1	Types of Routing	168
4.4.2	Operation Values	170
4.4.3	Operation-Level Costing	172
4.5	Work Centers and Resources	173
4.6	Procurement Alternatives and Mixed Costing	175
4.6.1	Internal Processing	176
4.6.2	External Procurement	177
4.6.3	Plant to Plant Transfer	177
4.6.4	Subcontracting	178
4.6.5	Mixing Ratios	178
4.7	Projects	179
4.7.1	Work Breakdown Structure Elements	180
4.7.2	Networks and Network Activities	181

4.8	Investment Programs	183
4.8.1	Appropriation Requests	185
4.9	Primary Cost Elements and P&L Accounts	186
4.9.1	Chart of Accounts	187
4.9.2	Controlling and the Financial Accounts	189
4.10	Setting Prices for Product Costing	191
4.10.1	Setting Standard Costs for Raw Materials	192
4.10.2	Balance Sheet Valuation	195
4.10.3	Calculating Actual Costs	196
4.10.4	Cross-Company Costing	196
4.11	Summary	198

5 Planning and Budgeting 201

5.1	Complete Sales Plan in a Manufacturing Environment	203
5.1.1	Sales and Operations Planning	205
5.1.2	Cost Center Planning	211
5.1.3	Calculate Standard Costs for Products to Be Manufactured	230
5.1.4	Profitability Planning	245
5.2	Planning and Budgeting For Investment Programs	246
5.2.1	Investment Program	247
5.2.2	Overall Plan	247
5.2.3	Cost Element Planning	248
5.2.4	Budgeting	251
5.2.5	Displaying and Changing a Budget	254
5.3	Summary	256

6 Actual Postings 257

6.1	Integrated Process Flows: Buy, Make, and Sell	257
6.1.1	Procure to Pay	258
6.1.2	Plan to Manufacture	267
6.1.3	Order to Cash	281
6.2	Distribution of Usage Variances	289
6.2.1	Capturing Physical Inventory Documents	290
6.2.2	Distribution of Usage Variances	292
6.2.3	Distribution of Activities	293
6.3	Integrated Process Flows: Other Logistics Scenarios	295

6.3.1	Product Cost by Order	295
6.3.2	Product Cost by Period	300
6.3.3	Product Cost by Sales Order	302
6.3.4	Project Controlling	307
6.4	Corrections or Adjustment Postings	313
6.4.1	Reposting Line Items	314
6.4.2	Correcting an Activity Allocation	317
6.4.3	Reposting Values	318
6.5	Cross-Company Postings	319
6.6	Summary	324
7	Period Close	325
7.1	Allocations	326
7.1.1	Steps Prior to the Start of the Period Close	328
7.1.2	Depreciation of Fixed Assets	328
7.1.3	Allocations Between Cost Centers	330
7.1.4	Allocations to Profitability Analysis	343
7.1.5	Target Costs and Variances on Cost Centers	347
7.2	Calculations and Settlement	352
7.2.1	Overhead Calculation	355
7.2.2	Work in Process	357
7.2.3	Target Costs and Variances in Production	361
7.2.4	Settlement	367
7.2.5	Product Cost by Sales Order	369
7.3	Multilevel Actual Costing in Material Ledger	371
7.3.1	Types of Costing Run	372
7.3.2	Periodic Costing Run	372
7.3.3	Alternative Valuation Run	378
7.4	CO-PA Processes	384
7.4.1	Revaluation	384
7.4.2	Top-Down Distribution	385
7.5	Summary	386
8	Reporting in SAP NetWeaver BW and SAP BusinessObjects ...	387
8.1	Reporting on Large Data Volumes in SAP ERP	388
8.1.1	Using Extracts to Accelerate Cost Center and Internal Order Reports	388

8.1.2	Using Summarization Levels to Accelerate CO-PA Reports	392
8.1.3	Using Summarization in Product Cost Reports	393
8.2	How to Decide Whether You Need SAP NetWeaver BW for Reporting	395
8.2.1	Performance Concerns	395
8.2.2	Multidimensionality	401
8.2.3	Navigation Attributes	404
8.2.4	Inclusion of Non-SAP Data	408
8.2.5	Building Queries	409
8.3	Cost Center Reporting in SAP NetWeaver BW	413
8.4	Reporting with SAP BusinessObjects Tools	418
8.4.1	Crystal Reports for Controlling	418
8.4.2	Dashboards for Controlling	422
8.4.3	SAP BusinessObjects Explorer for CO-PA Reporting	423
8.5	Summary	426

9 Master Data in a Multisystem/Shared Service Environment ... 427

9.1	Change Requests in SAP ERP	430
9.2	New Solutions for Handling Master Data in a Multisystem Environment	436
9.2.1	Data Modeling in SAP Master Data Governance for Financials	437
9.2.2	Editions in SAP Master Data Governance for Financials ...	438
9.3	Governance Requirements for Master Data	443
9.3.1	Creating a Change Request	443
9.3.2	Finding Change Requests	448
9.3.3	Workflow Steps for a Change Request	449
9.4	Creating Change Requests in a Shared Service Center	451
9.5	Summary	456

10 Planning in SAP NetWeaver BW or SAP SEM 457

10.1	New Options for Planning	459
10.1.1	Structure of Planning Applications in SAP ERP	459
10.1.2	Structure of Planning Applications in SAP NetWeaver BW	462

10.1.3	Multidimensional Database Layer in SAP NetWeaver BW	464
10.1.4	Data Entry and Planning Functions	469
10.2	Options in SAP ERP from SAP Enhancement Package 6 for SAP ERP 6.0	472
10.2.1	Role Project Planner and Cost Estimator	473
10.2.2	Overall Planning	474
10.2.3	Cost Element Planning	476
10.3	Express Planning as a Framework for the Planning Process	479
10.3.1	Creating a Planning Round	480
10.3.2	How Cost Center Managers Submit Their Data	487
10.3.3	Monitoring, Reviewing, and Approving the Planning Process	491
10.3.4	Embedding Overall and Cost Element Planning in Express Planning	493
10.4	Summary	495

11 Allocations Using SAP Cost and Profitability Management 497

11.1	New Tools for Performing Allocations in SAP ERP	500
11.1.1	Template Allocations in SAP ERP	501
11.2	New Tools for Performing Allocations in SAP BusinessObjects PCM	510
11.2.1	Mapping the Costing Model in SAP BusinessObjects PCM with SAP ERP	512
11.2.2	Dimensions of the Costing Model	513
11.2.3	Assignments in the Costing Model	518
11.2.4	Loading Data to the Model	521
11.3	Customer Value Analysis Using SAP BusinessObjects PCM	523
11.4	Summary	525

12 Period Close Using SAP Financial Closing Cockpit 527

12.1	New Options for Accelerating the Period Close	528
12.1.1	Orchestrating Your Closing Tasks	530
12.1.2	Executing Your Close Tasks	533
12.1.3	Automating Closing Transactions	536
12.1.4	Creating Program Variants for Your Close Tasks	539

Contents

12.1.5	Scheduling Tasks	541
12.1.6	Using Workflows In the Close	546
12.1.7	Handling Costing Runs in Your Close	551
12.1.8	Handling Organizational Units in the Closing Cockpit	552
12.1.9	Closing Cockpit and SAP Financial Closing Cockpit	557
12.2	Closing Tasks in Multiple Systems	559
12.3	Summary	564
12.4	Post-Script	564
The Author		565
Index		567

This chapter discusses the roots of Controlling with SAP ERP Financials and introduces the basic Controlling functions. You'll learn what might be different from other systems you have encountered and where there is common ground.

1 Introduction

People taking their first class on Controlling with SAP ERP Financials (which we'll refer to as CO moving forward) are often daunted by the sheer range of functions, since CO is actually several costing systems rolled into one, covering Responsibility Accounting, Planning, Activity-Based Costing, Product Cost Accounting, and Profitability Management, whereas most other systems handle each of these areas separately. A quick glance at the SAP menu (see Figure 1.1) shows you a series of folders that you may not instantly be able to map to your current approach to cost accounting.

Let's start with the top menu point: COST ELEMENT ACCOUNTING. This can sound like an alien concept if you're used to seeing cost centers and orders simply as an account assignment in the general ledger, with postings made to an account and a "center." You may only be familiar with the term *account* and never have encountered the term *cost element* at all. The cost element provides the link to the General Ledger accounts, so typical cost elements are wages and salaries (for recording the costs associated with your workforce), materials and services (for recording the costs associated with the goods you buy and sell), depreciation (for recording the costs associated with your assets), utility costs, and so on. It's really just a word, so if it helps to carry on thinking of a cost element as an account, by all means do, at least for *primary cost elements*. Cost elements are also used to store the results of any allocation, so you'll also use several additional cost elements to define how costs flow through your organization. These cost elements are known as *secondary cost elements*, and we'll look at how to define the two types in Chapters 3 and 4. When defining your cost elements, it's also important to understand how the costs behave. Energy costs are *variable*, rising as the output of the cost center rises, but

rent costs are *fixed*, remaining constant irrespective of how much work the cost center performs.

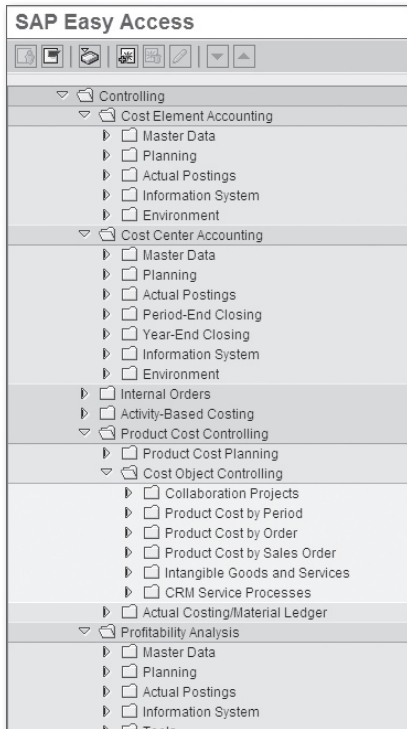


Figure 1.1 Controlling in the SAP Easy Access Menu

If the cost element answers the question of the *type* of costs incurred, the question of *why* such costs were incurred is answered in the next folders: COST CENTER ACCOUNTING and to a lesser extent INTERNAL ORDERS. Every posting in the SAP General Ledger recorded under an account with a sister cost element (the primary cost element) also requires you to enter the following:

- ▶ The *cost center* for which the costs were incurred (in the example of wages and salaries, for which department the employees were working)
- ▶ The *order or project* for which the costs were incurred (in the example of goods and services, which project required the purchase to be made).

Within this type of posting there is an idea of *responsibility accounting*, in other words of making the cost center manager responsible for the costs incurred for his cost center and the project manager responsible for the costs incurred for his project. For small projects, you may not even need a project in SAP ERP but will find that an internal order is adequate for your needs. The word *accounting* is related to *accountability*. It's the controller's task to ensure the accountability of the relevant managers for their spending on each cost center, order, or project.

With Cost Center Accounting and internal orders we are essentially looking at cost or expense accounting, If we now look at how to capture sales *revenue*, we move into the realm of Profitability Analysis (often shortened to CO-PA) (the bottom folder in Figure 1.1). If you're new to SAP, you need to understand that Profitability Analysis is essentially a data warehouse in SAP ERP where you can capture the costs and revenue associated with each customer and product and analyze your profitability by region, sales organization, business area, company code, and so on. Profitability Analysis is a very powerful tool but may provide a degree of granularity that differs from what you're used to if you currently capture costs and revenue mainly in your general ledger. It offers two alternative taxonomies for viewing the relevant values: by cost element (account-based) and by value field (costing-based). While most people can imagine costs and revenue accounts, the value fields represent a different view that can be more or less detailed than the account view, depending on business requirements.

If you now look more closely at the menus for COST CENTER ACCOUNTING, INTERNAL ORDERS, and PROFITABILITY ANALYSIS, you'll see that each of them contains a folder called PLANNING. The idea of planning and setting standards is central to CO, and we'll talk later about how to plan and why a plan is necessary in SAP ERP. This is especially important because it's usually the controller who drives the creation of the plan, establishing the framework and collaborating with all the involved parties until agreement is reached.

If you're performing any kind of manufacturing, then the process of turning the materials you buy into products you can sell is covered in Product Cost Controlling. Again, if you're used to managing work orders in a separate system, the idea that every work order in SAP ERP is a cost object in CO may be new. In the course of this book we'll discuss the different levels of detail you can use to capture the information on work orders. We'll compare the classic approach to standard costing with newer approaches, including *lean accounting*, which rejects the work order as the sole focus of cost accounting.

Finally, there is a folder for ACTIVITY-BASED COSTING, allowing you to capture costs for business processes such as quality control or product configuration that cannot be described in routings and master recipes. We'll return to this in more detail in Chapter 11.

Figure 1.2 may help you visualize the value flows through CO, with the cost centers and internal orders capturing expenses from the SAP General Ledger at the top; the business process as an optional account assignment for Activity-Based Costing below; the production orders, sales orders, and projects that are used to handle the organization's operations in the middle; and the multidimensional cube that is Profitability Analysis at the bottom. The boxes on the left represent the inputs to CO from the other components, and the boxes on the right represent the way costs flow from Cost Center Accounting to production orders, sales orders, and projects and via order settlement to Profitability Analysis.

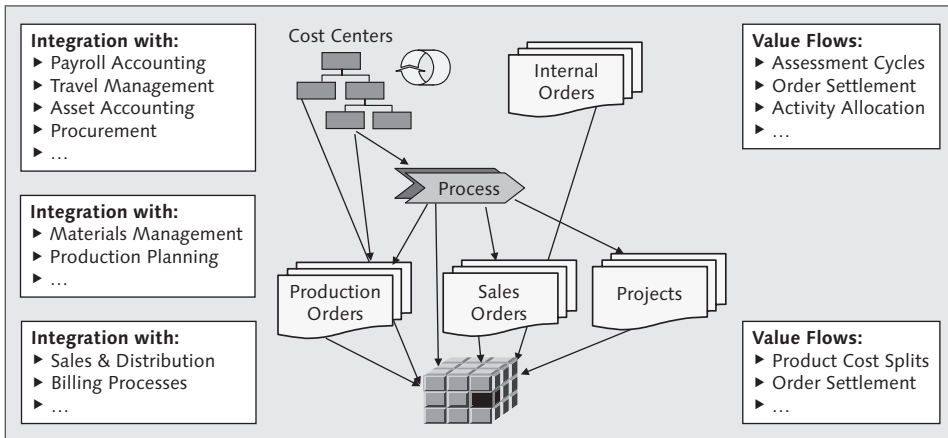


Figure 1.2 Value Flows in Controlling

1.1 Basic Controlling Functions

To understand how CO started out, we need to look at the work of Hans-Georg Plaut, an automotive engineer who became involved in management accounting in the late 1940s. His legacy is the system of *Grenzplankostenrechnung* (GPK), variously translated into English as "marginal planned cost accounting" or "flexible analysis cost planning and accounting," which has been the mainstay of German cost accounting for over 60 years. This approach shaped what we now know as CO

when he and his consultants worked with the SAP developers to build the RK components in SAP R/2 and the early CO components in SAP R/3. This being said, you certainly don't need to have studied cost accounting (aka controlling) in Germany to understand controlling in SAP, but it's worth taking a few minutes to look at the basic principles of cost accounting before we look at the software in detail.

1.1.1 Goals of Controlling

In this section, we'll take Hans-Georg Plaut's ideas about cost accounting as a starting point. The goal of controlling is to provide meaningful insight and analysis of accounting information for the benefit of internal users, such as controllers, cost center managers, project managers, plant managers, and so on. It's the controller's job to put a structure in place that provides meaningful cost information to the various managers. This is achieved as follows:

► Building clearly defined cost center structures

Each *cost center* represents the cost of resources employed, where a resource could be a machine, a building, or people working in a department. Each cost center should be homogenous in purpose. Generally, a single cost center is the responsibility of one manager. This is important in the sense that the cost center is not an anonymous pool of costs, but an entity for which one person is responsible. Accounting is effectively being used to drive accountability, with each manager being held responsible for the cost of the resources his cost center uses and what that cost center provides, whether it's the provision of goods and services or the support of other cost centers. It's the controller's job to ensure that a workable structure is in place that supports both the reporting needs of each cost center manager and the business needs of corporate reporting.

► Separating fixed and proportional costs

Costs behave differently depending on their type. So costs such as rent and insurance generally remain the same (*fixed*), while costs such as energy (*proportional*) rise if the production line runs for longer or the department has to handle more orders. The goal is to understand how costs behave under changing output levels and to explore capacity limitations and the utilization of available capacity. This is important because it's the reason why CO is separated from Financial Accounting. The rent payments or the energy payments are recorded in the financial accounts, but the explanation of what drives changes to the level of payments is in CO. The notion of fixed and variable costs is an area of endless debate among cost accountants who have to balance the practicality of their approach against

absolute accuracy. In recent years, there has been a trend toward unraveling and simplifying some of these assignments to make it easier for cost center managers and project managers to understand their costs and take effective action.

► **Establishing clearly defined activities and drivers**

The aim is to define at least one representative output measure, such as machine hours, for each cost center and to ensure a linear relationship between the product and the output measure (for example, machine hours) and between the output measure and the cost pool (costs incurred by the production cost center to provide machine hours). This approach focuses on outputs or drivers, whether it's the quantity of goods to be sold or produced in a given period or the quantity of work to be performed by a cost center, as a way of determining whether resources are being used efficiently. This approach applies to both the actual outputs and to planning, which is output-driven in the SAP approach. It's the controller's job to work with the cost center managers in this area. Some cost centers are easy: It's quite clear that a production line provides work in the form of machine hours. Whether an energy cost center is merely an expense that should be allocated to the operational cost centers or carries an output in the form of kilowatt hours of energy used will be a subject for discussion, and you'll find that there are no hard and fast rules governing how to determine the output of a cost center.

► **Using analytical cost planning**

The goal is to prepare a plan for each cost center that reflects realistic expectations for budget setting and operational performance. This plan is based on the output of the cost center (i.e., the machine hours required to perform the work) as a realistic expectation that is modeled during planning. The cost center output is, in turn, driven by the demand from production and sales for output (goods to be sold). This planning approach involves more work but provides greater insight than the "last year plus X%" approach that prevails in some organizations. It's the controller's job to coordinate and manage this plan in a collaborative effort, involving the sales managers, cost center managers, and so on, since the plan is not just about gathering the numbers but is also about reaching agreement about realistic goals for the next planning period.

► **Setting standards**

The aim is to set stable standards for the period that allow users to understand the variances, and it's the controller's job to ensure that such a standard is in place. Standard setting is an important part of the cost accounting approach,

providing a standard for the provision of a given level of activity by a cost center or a standard for the production of a given lot size of a product. In both cases, variances with respect to this standard are analyzed at period close to explain the source of the variance (price change, quantity change, and so on). Variance analysis is initially the controller's task, but for high variances or scrap this typically involves discussions with the relevant plant managers to understand the underlying cause of the variance and where it indicates problems on the shop floor. Variance analysis should be treated not as an academic exercise, but as a need to ask "Why?" Was the standard wrong or do we need to make some changes to reduce rework or scrap?

► **Correctly allocating internal service costs**

The goal is to reflect the true supply-and-demand conditions for usage of each resource. This applies not only to production cost centers, but potentially to all cost centers for which output measures can reasonably be established, so you'll find cost centers for IT services, human resources, finance, and so on being modeled as service providers alongside more obviously measurable cost centers. It's the controller's job to set up a model that supports the proper allocation of all internal services.

1.1.2 Cost Accounting in the United States

While the notion of standard cost accounting and variance analysis is well established in the United States, there are some fundamental differences between Germany and the United States.

- U.S. organizations typically have fewer cost centers than their German counterparts, making it sometimes difficult to establish a single output for each cost center.
- U.S. organizations often separate the accounts into fixed and variable accounts, rather than separating the idea of the account from the idea of the cost element. In CO, costs are categorized in terms of how they respond to the changing output of the cost center and to the changing production output. Indeed, it's often clearer to use the word *proportional* rather than *variable* to represent the way this relationship works. To understand this, think of how the energy costs for the cost center will rise if the number of machine hours produced in the period rises and how the number of machine hours needed in the period will rise if more units are produced.

- ▶ U.S. organizations often plan using software that is not integrated with their cost accounting system, rather than seeing planning as an integral part of controlling and the basis for all variance analysis.

1.1.3 Standard Costs and Actual Costs

The central importance of planning and standard-setting brings us to one of the first myths about CO, namely that it's only possible to work with *standard costs*. When we discuss the material master in Chapter 4, we'll cover how setting a standard price for the manufacture of a unit of the product is an option and that it makes sense to apply a standard price to goods movements, where finished goods are received to stock and issued to sales before all actual costs (invoices, time recording, etc.) have been recorded. However, since Release 4.6C, it has been possible to use the Material Ledger to calculate true actual costs at period close that take account of all price variances and production variances. We'll look at this in detail in Chapters 6 and 7. The wording on some of the screens only adds to the confusion, since many of the delivered reports use the term *actual costs* simply to mean the actual quantity multiplied by a standard price, whereas the *true* actual costs are only calculated at period close when the periodic costing run is executed. We'll look at this whole process when we consider the period close in Chapter 7.

1.1.4 Investment and Project Controlling

Alongside production controlling, sales controlling, and so on, we'll also explore investment controlling. You'll find the functions for Investment Management in a separate part of the menu (see Figure 1.3), but there is so much overlap in the assignment of costs to internal orders and projects that no book on CO can afford to leave out the subject of Investment Management. If you're completely new to the subject, think of the investment program simply as a reporting layer structuring the investment portfolio and providing budgeting functions over and above a simple plan/actual comparison at the project or order level. The area is of interest for the controller whenever there is significant expense involved in bringing a new product to market or building a new production line that is not captured if you only look at sales or production controlling.

If you compare the CO menu and the Investment Management menu, you'll notice that the INTERNAL ORDERS folder for INVESTMENT MANAGEMENT contains exactly the same entries as the INTERNAL ORDERS folder for CONTROLLING. The difference

is in the definition of investment programs to which the investment orders and projects are assigned and the use of appropriation requests to initiate an investment proposal.

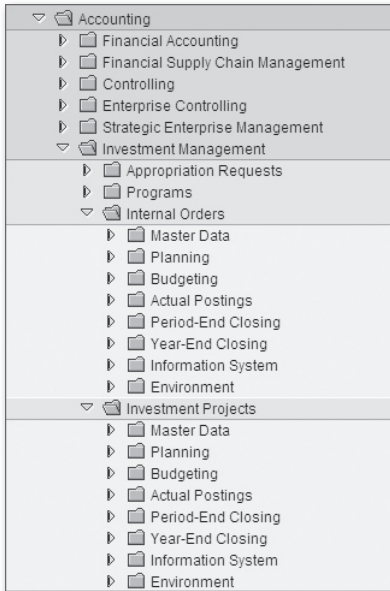


Figure 1.3 Investment Management in the SAP Easy Access Menu

1.1.5 Lean Accounting

One function you won't find in the SAP Easy Access Menu, but you'll find discussed throughout the book is the idea of lean accounting. The practice of lean accounting can provide a useful guide to many implementation questions, encouraging the use of clean master data, simple reporting structures, and data that everyone (not just the controller) can understand and act upon.

Now that we've introduced the main elements, let's look at CO as a bookkeeping function and how expenses move from the SAP General Ledger into CO.

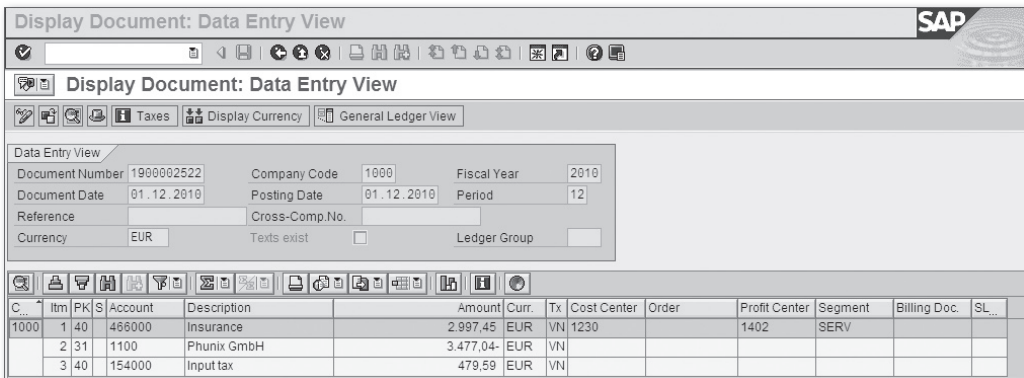
1.2 Essential Record Keeping Functions

Apart from the general ideas underpinning controlling, it's also important to understand that CO is not stand-alone software taking feeds from financial and

operational logistics systems. It's embedded in SAP ERP and is essentially the glue that links operational logistics to finance. What a financial accountant sees as essential bookkeeping, the controller sees as a dialog between purchasing and finance or between production and finance.

To understand what we mean, think about the nature of a cost center.

- ▶ In a stand-alone system, a cost center describes a pool of costs that are incurred by a department, a group of workers, or a machine. The assignment to the cost center may be made in the general ledger as an extension of the account assignment, or it may involve mapping certain accounts to that cost pool.
- ▶ In SAP ERP, the cost center is part of the SAP General Ledger posting, but it's also part of the Logistics transaction that initiates the cost posting. So a purchase request is created and approved with reference to the cost center under which the costs for the purchased goods will ultimately be posted. The purchase order and invoice from the supplier carry the information that the purchase relates to a specific cost center. So the purchase costs are captured in Logistics and recorded in both the SAP General Ledger and Cost Center Accounting. This means you can't design your cost center structure without also looking at how purchases will be initiated with reference to the cost center. The cost center thus becomes more than just an account assignment, affecting the way you design your approval processes, so that the cost center manager can authorize all purchases carried out with reference to the cost center.



The screenshot shows the SAP 'Display Document: Data Entry View' interface. The document number is 1900002522, company code is 1000, and fiscal year is 2010. The document date is 01.12.2010, posting date is 01.12.2010, and period is 12. The currency is EUR. The table below shows the expense posting details:

C.	Item	PK	S	Account	Description	Amount	Curr.	Tx	Cost Center	Order	Profit Center	Segment	Billing Doc.	SL
1000	1	40		466000	Insurance	2.997,45	EUR	VN	1230		1402	SERV		
	2	31		1100	Phunix GmbH	3.477,04-	EUR	VN						
	3	40		154000	Input tax	479,59	EUR	VN						

Figure 1.4 Expense Posting to a Cost Center

Figure 1.4 shows a posting for insurance expenses to a cost center. This posting will be passed from the SAP General Ledger into Cost Center Accounting under

the cost element associated with the profit and loss (P&L) account for the insurance expenses. You'll also notice that the expenses have also been assigned to the profit center and segment in the cost center master. What you need to remember is that in a fully integrated SAP ERP implementation the majority of postings coming into CO originate not in the General Ledger, but in purchasing, production, human resources, and so on and that the account assignment is automatically populated based on the cost center in the relevant application (the purchase order in purchasing, the organizational unit for payroll, and so on).

The same basic principle applies to orders and projects.

- ▶ A stand-alone system can also capture order or project costs as an extension of the general ledger posting and even support basic time recording.
- ▶ What makes CO unique is the way the order is embedded in Logistics and in Time Recording in human resources. A cost allocation takes place automatically when an order confirmation is recorded in Logistics to record that an operation has been completed, a quantity of product finished, or even a quantity scrapped. The same thing happens when an employee records his working time with reference to the order or project in human resources. This cost assignment utilizes the planned activity rate for the machine or labor hours confirmed to the production order or the hourly rate for the employee charging time to a project to make an immediate charge to the order or project. This may be corrected at period close, when the actual costs for the period are known.
- ▶ This tight integration has its challenges in the sense that you have to make sure that the master data in production and the organizational units in human resources tie in with the cost center master data. On the other hand, the basis for many of the allocations is being collected not in finance but where the activity is carried out on the shop floor or an employee's time sheet. Bills of material (BOMs), routings, master recipes, maintenance plans, and so on provide the basis for cost calculations requiring only basic monitoring work from the controlling department. By comparison, most organizations' attempts to capture activity drivers in Activity-Based Costing systems have been quite difficult, with frequent reliance on spreadsheets and slightly unreliable data integration.

1.2.1 Record Keeping by Cost Center

As we discussed, the cost center represents the cost of resources employed, where a resource might be a machine, a building, or people working in a department. This

helps you answer simple questions, such as the amount of travel expenses incurred by a given department or the level of rent and maintenance costs for a building, but also the level of efficiency of a production line or an oven.

It's best to design cost centers so a single manager is responsible for each. This may simply be a management view for reporting purposes, but it's also relevant in operational processes, since the cost center manager approves purchase requests, travel expenses, and working time.

Cost Center Expenses

Let's look first at the types of costs that might be assigned to a cost center. We already mentioned that purchase costs are assigned to the cost center via the purchase order. Travel expenses are captured in a similar way, with all travel requests containing the assignment to the employee's cost center. When the travel expense is paid out, it's automatically assigned to the employee's cost center.

Cost centers can also represent production resources, including machines and equipment. In production, the machine is represented as a work center or resource, and in Plant Maintenance, the machine is represented as equipment. Generally, the machine is also a fixed asset, the costs of which have to be depreciated according to whichever generally accepted accounting principle (GAAP) applies in the relevant company code. The amount of depreciation according to each accounting principle is calculated in fixed asset accounting and transferred to the cost center during the depreciation run that takes place once a month.

Payroll is another significant cost input. The costs of employing staff and workers are captured in SAP ERP Human Capital Management and paid out based on the organizational unit to which the employee is assigned. In SAP ERP, the organizational unit is linked with a cost center, and all payroll expenses are transferred to the general ledger with the correct cost center assignment.

Cost centers can also receive costs from other cost centers. This might be in the form of general expenses (i.e., rent and insurance that are captured centrally and then allocated) or work performed by other cost centers (i.e., maintenance work, quality checks, or the cost of hiring or training new workers).

Cost Center Outputs

In CO, cost centers represent both where the costs were incurred in the organization and what was done with these costs. For a machine this may seem obvious. The production cost center receives depreciation expenses, payroll costs, energy costs, maintenance costs, and so on and provides machine hours. Assuming you have established routings or master recipes to describe the production steps, confirmations in Logistics record how many hours of machine time are required for each order. Even if you don't have detailed routings yet, there are ways to capture machine time, which we'll discuss in Chapter 6.

For a maintenance department, the same principle applies. The cost center receives payroll costs, operating supplies, and so on and provides maintenance hours. Assuming you have established maintenance plans, the costs of each maintenance task are assigned to the maintenance order when you make a confirmation.

For a sales department, the question of output may be more difficult. The Plaut approach advocates having an output measure for all cost centers, so you may find an activity such as sales hours being captured, but how can this be charged? What typically happens in these circumstances is that some form of allocation takes place. Either the expenses incurred by the sales department or the sum of the sales hours worked in the period are allocated to the customers served. We'll discuss the various forms of allocation in more detail when we look at the master data for activity types in Chapter 3, how to perform allocations in Chapter 7, and new options for allocations in Chapter 11.

For other departments, it may be possible to establish time recording in human resources, where time worked is charged to orders or projects. These might be research departments, development departments, consulting departments, and so on.

Handling Inventory

One source of confusion if you're moving from a U.S. legacy system is that the cost center output is always machine time, labor time, setup time, and so on (in other words, work provided), but not inventory (in other words, material produced). This is important in a manufacturing scenario, because although the costs of operating supplies might be assigned to a cost center, the inventory of raw materials and semifinished and finished products don't flow through the cost center, but are

recorded on production orders, sales orders, projects, and so on. We'll look at this process in more detail in Chapter 6.

1.2.2 Record Keeping by Order

We've already met production orders for manufacturing a product and maintenance orders for repairing an asset, but there are many more types of orders in SAP ERP, from investment orders for capital expenses to service orders for performing external maintenance work and internal orders that represent activities outside of SAP ERP. There are also internal orders that the controlling department creates as cost collectors where more detail is required than is possible on a single cost center (such as for each vehicle assigned to a car pool).

Order Expenses

Regarding expense postings, all these orders behave the same way. You can assign purchasing costs, travel costs, and payroll costs to an order instead of a cost center by adjusting the account assignment. The underlying business question is simply why the purchase is necessary.

- ▶ Will the purchase provide equipment, such as a laptop or cell phone, for an employee assigned to the cost center or operating supplies, such as oil or grease, that are needed for the work of the cost center? If this is the case, the costs should be assigned to the cost center.
- ▶ Will the purchase provide goods or services that are specific to the order, such as buying consulting services to deliver on a project or order, buying materials for a building that is under construction, whose costs will later be capitalized as assets under construction, or buying materials for a special project? If this is the case, the costs should be assigned to an order.

For production orders and maintenance orders, it's also common to issue goods from stock to the order, whether as raw materials for use in a production order or as service parts for use in a maintenance or service order.

Other Postings to an Order

In addition to general overhead costs, you'll also find orders used in a *time and materials* approach, where the time part can be as significant as the materials. The SAP approach records time from external contractors as a primary cost via the

purchase order, but time worked by people in the same organization is captured using the Time Recording functionality in SAP ERP HCM or Direct Activity Allocation in CO. In both cases, the employee enters working time in the form of the number of hours worked for the order, and a standard rate for one unit of this time is applied to the order. This takes us back to the output measure for each cost center. The activities of the employees would be represented on the cost center as research tasks, development tasks, maintenance tasks, and so on. When the employee charges his development time to the order or project, his cost center is credited and the order debited for his work.

Order Settlement

Once costs have been accumulated on an order, they are *settled*, or charged to another object. There are as many settlement options as there are types of orders. Maintenance orders and quality orders generally settle their costs back to the "parent" cost center. Production orders generally settle their production variances to Profitability Analysis. Investment orders generally settle their costs to assets under construction or fixed assets. Internal orders that represent a detailing of the cost center's activities, such as attending trade fairs, may settle either to the parent cost center (here the marketing cost center) or to the regions and customer groups attending the trade fairs. You'll also find mixed assignments, where some of the construction costs are assigned to a fixed asset and others to a cost center. We'll look at settlement in more detail in Chapters 3 and 7.

1.2.3 Record Keeping by Project

Sometimes an order does not provide adequate detail for the activity to be undertaken. A complex research project or construction project may need to be broken down into separate phases and activities for transparency. It can also be that parts of the project are being handled by different parts of the organization and in extreme cases by different companies in the organization. This breakdown of the project activities is known as a work breakdown structure, with each element represented as a *work breakdown structure element* (WBS element).

In complex engineering environments, you may find the work breakdown structure being used in conjunction with networks. In this case, the WBS elements represent the organizational view of the project, while the networks represent the logistics view providing scheduling tools for handling different work dependencies. WBS

elements, networks, and network activities are all cost objects and can carry costs just like an internal order. WBS elements can also carry budgets since it's common in these scenarios to set an upper limit on spending in a given time frame.

With commercial projects, alongside the expense postings and time and materials postings, it's common to also capture revenue, since the customer is invoiced when certain milestones are reached. The billing process differs from the billing process for a make-to-stock product in that the delivery of the finished product is not the trigger. Instead, billing has to be triggered either based on an invoice plan or based on the resources spent on the project. In this situation, it's usual for the project costs to be settled to the sales order item.

While cost collection by cost center, order, or project essentially takes place in real time whenever a goods movement is posted and controlling is largely in a *monitoring* role, the controller is in the front seat at period close when the time comes to handle the close and the valuation of work in process and assets under construction, which we'll cover in the next section.

1.3 Managing Close and Valuation Processes

We've looked so far at many of the transactions that result in costs being assigned to cost centers and orders. One of the things that make CO confusing if you're coming from a stand-alone costing system is that some of the transactions, such as goods movements, asset acquisitions, invoice receipts, and so on, result in postings in the SAP General Ledger in *real-time*, whereas other postings take place at *period close*, such as allocations and order settlement. This is perhaps the most difficult part of the SAP approach to controlling. Inventory movements are valued immediately at standard costs but may be adjusted to account for variances later. Work in process, on the other hand, is moved to the balance sheet at period close and then reversed when the order is complete.

1.3.1 Valuation of Goods Movements

SAP recommends that you value finished and semifinished products at standard costs. This is because the delivery of these goods to stock and removal for sale can take place before all cost information relating to the production order has been

posted. The standard cost thus represents the best guess for valuation purposes, even though, as we said earlier, the inventory value can be adjusted later if you use the Material Ledger. This approach also takes away the danger of inconsistencies during settlement, where goods are only revalued if there are still goods in stock.

1.3.2 Work in Process

In most U.S. systems, the movement of raw materials to the shop floor and on completion from the shop floor to finished goods inventory is treated as a reclassification of the balance sheet from raw materials inventory to *work in process* (WIP) and from there to finished goods inventory.

In CO, while the issue of the raw materials to the shop floor and the delivery of the finished product to the stores are *immediately* visible in the balance sheet, work in process is only calculated once per period. So the raw materials issued to the production order are treated as an expense on the profit and loss (P&L) statement during the period. Any work performed to convert the raw materials into a product is also expensed to the production order.

If the order is not complete at period close, the difference between the actual costs on the order and the value of any deliveries of the finished goods to stock is captured as work in process. On settlement the value of the work in process is moved to the balance sheet. If work continues in the next period, the value of the work in process increases. The difference from the previous period is moved to the balance sheet using settlement. Finally, when the order is complete, the value of the work in process is reversed and the balance sheet value is zero.

1.3.3 Scrap

In most U.S. systems, *scrap* is treated as a balance sheet item. In CO, the value of scrap is calculated during variance calculation. In the SAP approach, a distinction is made between normal and abnormal spoilage. Normal spoilage arises under efficient operation conditions and is an inherent result of the production process. The costs of normal spoilage are viewed as part of the costs of good units manufactured and included in the standard costs as *planned scrap*. Abnormal spoilage is not expected to arise under efficient operation conditions, and most abnormal spoilage is regarded as avoidable and controllable. The costs of abnormal spoilage are written off as

losses of the accounting period in which the detection of the spoiled units occurs. In the SAP approach, abnormal spoilage is treated as a *scrap variance*.

1.3.4 Work in Process for Projects

In large-scale projects, the costs and revenues may not be representative of the actual stage of completion. At the beginning of the project high costs may be incurred to procure the correct components and begin work. On the revenue side, the billing schedule to the customer may not correspond with the amount of work completed or the costs incurred.

In this case, *results analysis* is used to smooth the pattern of the postings. There are two main approaches:

► **Percentage of completion (POC)**

The POC method involves looking at the costs incurred compared to the planned costs to determine the percentage of completion. The revenue to be recognized in the period is then calculated based on the percentage of completion. Generally the actual revenue is lower than the revenue calculated according to the POC method, and a posting is prepared for revenues in excess of billings.

► **Revenue-based results analysis**

The revenue-based results analysis method involves comparing the revenues to the planned revenues and planned costs to calculate the cost of goods sold that relate to these revenues. Normally the actual costs are higher than the calculated cost of goods sold because expenses have been incurred that have yet to be billed for, so work in process is calculated for the difference. Occasionally the actual costs are lower than the calculated costs, because time recording and invoices from contractors are missing, so reserves for missing costs are calculated for the difference.

Normally your implementation team defines which methods of results analysis are active in your system, but it's the controller's job to execute the valuation tasks at period close. We'll come back to results analysis when we look at period close activities in Chapter 7.

If period close has the controller in the hot seat for several days each month, the other area where the controller is active is the area of preparing budgets and planning, as described in the next section.

1.4 Preparing Budgets and Planning

As we noted earlier, Analytical Cost Planning is a key element of a good costing system and an area where the integration between the different plans in SAP ERP makes the approach feasible. People are often confused by this in the English-speaking world since the terms *planning* and *budgeting* tend to be used synonymously. In SAP systems, the *cost plan* refers to the exercise of valuating a sales plan or preparing a plan for individual cost centers or orders. A plan is just a plan—a set of assumptions about future business performance. A *budget* is something else. A budget may be derived from a plan, but it refers to the fixed budget to complete the order or project. The budget is checked whenever postings are made that will affect costs, whether these are expense postings in the general ledger or purchase orders that will result in costs in the future.

1.4.1 Driver-Based Cost Planning

The driver-based planning approach is considered a best practice in the manufacturing industry, where the sales plan or the production plan defines the expected output. Companies in the service industries also use driver-based planning, but instead of a physical quantity of goods to make and sell, a bank, for instance, might plan the clerical hours required to handle the loan applications it hopes to process in a given region or the clerical hours required to issue the new credit cards it hopes to issue in the next planning period.

The objective of planning is to provide a more accurate picture of expected future business performance by planning and monitoring the key operational activities that drive these results. This sounds easy enough but can mean completely rethinking the way you approach planning. With the SAP approach, you start the planning process not with the monetary values for the period, such as dollars per line of business, but with the sales quantities and production quantities. You then use these to calculate how much work you'll need to put in to meet your targets. Ultimately, the amount of work required takes you to the capacity per resource, whether this is a cost center supplying machine time or a call center providing clerical hours. You then plan your expenses against these drivers to calculate the resources you'll consume on each cost center to execute your plan.

We'll walk through the whole process in Chapter 5, but to get an idea of the scope of the plan, consider the following steps:

1. Create sales plan. This is where you can enter the quantities of product to sell to each customer and check the planned revenue (sales managers).
2. Create production plan. You can transfer the sales quantities to production and adjust them if necessary (production planners).
3. Transfer production requirements to cost center plan. You can use the production quantities to calculate the number of production activities required to complete the necessary work and transfer these quantities to the cost center plan as the *scheduled activity* (administrator).
4. Match cost center capacities against scheduled activity from production. You can check the capacities for each cost center and activity against scheduled activity to provide a reality check regarding the amount of activity requested by production (controllers).
5. Plan activity-dependent costs per cost center and activity type. This is probably the most fundamental difference between the way many organizations plan monetary values per cost center and the way the SAP approach distinguishes between costs such as rent and insurance that are fixed and costs such as energy that vary with the amount of activity provided in each period. The two are planned in separate *planning layouts* (cost center managers).
6. Calculate standard rate for activity types. For a cost center with a single output, or one activity type, this activity price calculation divides the expenses by the activity type to provide a rate per hour. If the cost center provides more than one activity, then activity price calculation first splits the expenses to the activity types using either equivalence number. The result is a rate per hour for each of the activities (controllers).
7. Calculate standard costs for products to be manufactured. From here, you can calculate standard costs for all the finished products in the original sales plan. This uses the bill of material to determine the material usage and the routing to determine the number of machine hours and so on needed. The activity rate per hour is then applied to these machine hours (controllers).
8. Transfer standard costs to sales plan to determine planned profitability. Finally you can use the valuation function in the sales plan to pull the standard costs for the materials into the sales plan to determine profitability (controllers).

1.4.2 Driver-Based Cost Planning Between Cost Centers

While the above approach to sales planning is widely used in the United States, the business of planning activities between cost centers is not very common outside of the German-speaking world. Most organizations plan expenses by cost center and then compare the actual costs with the planned costs for the period and analyze the variance. However, such an approach has its limitations in that it doesn't take into account whether the cost center did more or less work in the period.

In CO, if you have captured an output quantity for the cost center, the planned costs will be adjusted to reflect the actual output for the period. The adjusted costs are known as *target costs*. While production cost centers usually have a planned output in terms of the number of machine hours, labor hours, and so on, service cost centers often don't. The SAP approach is to plan activities for most cost centers. It involves planning:

► **What the cost center output is**

The activity types to be performed and the quantities of that activity (output) to be provided.

► **What the cost center will spend to perform this activity**

SAP differentiates here between activity-dependent costs and activity-independent costs.

► **How the output of this cost center is to be used**

How much of each activity will flow to other cost centers and orders in the course of the planning period.

This is a much more detailed form of cost center planning than many organizations currently perform, but it provides a very powerful way of establishing the targets for the cost center and measuring whether these targets have been achieved. This form of planning also presupposes that the activity flow is *reconciled*—supply reflects demand—and that the flow of activities will be valued with a price, that is calculated by dividing the planned costs by either the planned activity or (more rarely) the planned capacity for the cost center. In theory this reconciliation is technical in nature, but the controller provides the human element, negotiating with both the supplying and the requesting cost center to determine whether the plan is reasonable. We'll walk through this process in detail in Chapter 5.

1.4.3 Budgeting

It's also common to perform very detailed cost planning for projects prior to approval, and it's the controller's job to coordinate the planning process with the individual project managers and ensure that their demands are reconciled with the goals set by corporate controlling. This may start with a rough plan, called the *overall plan*, which provides rough values per WBS element and year. The work breakdown structure is hierarchical. Values can be entered for the top WBS elements and distributed down to lower WBS elements or entered for lower WBS elements and aggregated up to the higher-level WBS elements. The process thus involves both *top-down* and *bottom-up planning*. Figure 1.5 illustrates the flow in both directions, with the budget for Europe being distributed down to the individual projects on the left and the order and project plans for the United States being rolled up to the corporate level on the right.

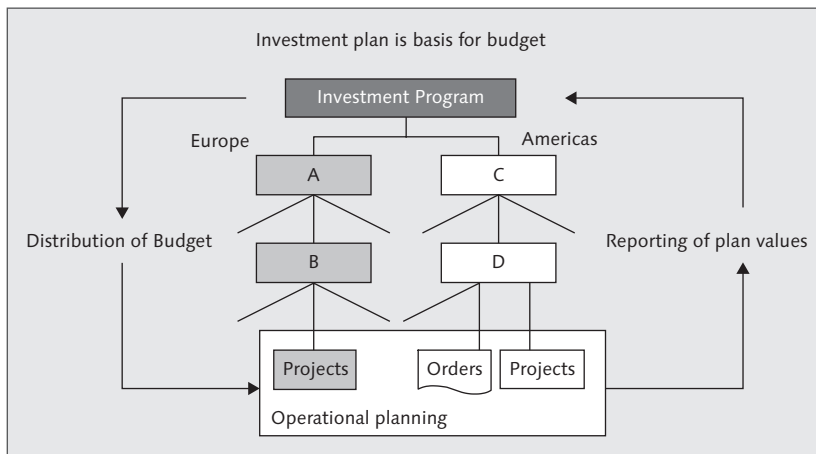


Figure 1.5 Value Flow in Top-Down and Bottom Up Planning of Investments

This plan is often created more than a year before execution is expected to begin in order to provide supporting information for the investment decision. This may be supplemented by detailed cost element planning where sufficient information exists to support this type of planning.

Once the plan is approved, it's often copied to the *budget*. This represents a binding plan that is used to determine how resources can be spent on the project. There are two types of budgeting:

- ▶ Passive budgeting involves the use of reports to monitor spending and commitments and to alert managers to potential budget overruns.
- ▶ Active budgeting or *active availability control* is used to set a ceiling on spending. If the ceiling is reached, you won't be allowed to create another purchase order or post costs to the project. This may take the form of a warning message or an error message that effectively blocks spending.

Since the budget is so critical, processes exist in controlling to document the level of the original budget and to allow you to assign additional budget to the project (a *supplement*), return unused budget (a *return*), and request a budget transfer from another project. These processes are handled as separate transactions and can involve the use of a workflow to handle the necessary approvals.

Now that you understand budgets and planning, let's move on to process analysis and internal controls.

1.5 Process Analysis and Internal Controls

The material we've covered up to this point could have been written at any point since SAP R/3 Release 4.6C. What changed at the turn of the century was the massive failure in financial reporting, governance practices, and risk prevention that created a need for sustainable improvement in these areas, leading to the Sarbanes-Oxley Act (SOX) in the United States and similar mandates and regulations in other countries. In terms of financial compliance, Section 302 of SOX states that CEOs and CFOs must personally sign off on their company's financial statements. Section 404 mandates that well-defined and documented processes and controls must be in place for all aspects of company operations that affect financial reports.

A whole industry has risen around the concerns of governance, risk, and compliance, and this guide cannot cover all the internal and external risks facing organizations. What is important in this context is to understand where you need to look at your controlling processes to achieve compliance.

1.5.1 Master Data Controls

The obvious place to start is the area of master data controls. The master data underlies all business processes, and poor master data quality can lead to significant risks. There needs to be a clear process in place to govern who can create

or change any object to which costs can be assigned. This includes the creation of cost elements, cost centers, orders, projects, and so on. We'll return to this in Chapters 3 and 4. We'll also look at a new solution, SAP Master Data Governance in Financials, in Chapter 9.

1.5.2 Workflow

Once the master data is correctly in place, it makes sense to review all workflows and approval procedures to understand who is authorized to approve purchases, travel expenses, time recording, and anything else that can result in costs. Normally this sort of procedure applies mainly to incidental expenses, such as the purchase of a new laptop for a cost center, while the purchase of goods for use in production is not handled via a single workflow item. Here it's important to ensure that system controls are in place to check the three-way match required for logistics invoice verification (purchase order, goods receipt, and invoice receipt) and how price variances are handled in Purchasing.

For budget approval, SAP has its own transactions for releasing budgets and documenting the issue of budget supplements, budget returns, budget transfers, and so on. We'll look at these in Chapter 5.

1.5.3 Process Controls

Because of the huge impact of the standard costs in determining how goods movements are valued, it's important to properly document the planning process, including how activity rates are calculated and checked, how standard costs are calculated and checked, and who can mark and release the standard cost estimate and thus trigger a balance sheet adjustment for the inventory of that material currently in stock.

Similarly, if you have commercial projects or investment projects, it's important to understand how planning for these projects is performed, who signs off on the plan, and which planning values are used in results analysis to calculate work in process or put a value on assets under construction, so that your projects are correctly represented in the balance sheet at period close.

It's also important to review every step of the period close, to understand who signs off on each step, and what checks are performed. This is especially important in the area of order settlement, where expenses are capitalized as work in process,

assets under construction, and so on. If you're using the Material Ledger, it's also important to document carefully which checks are performed after each stage of the costing run to ensure that the values are correct, how manual changes are performed and documented, and who can create the inventory adjustment postings to take account of the newly calculated actual costs.

1.6 Summary

In this chapter we introduced the roots of the SAP approach to controlling and explained how it differs in certain respects from common practices in the United States and other countries. We looked at recommendations for cost center design, a subject we'll return to along with what output measures to use and how to create internal orders in Chapter 3. We looked at how cost centers, orders, and projects provide the link between operational processes, such as purchasing and production and the general ledger, a subject we'll return to in Chapter 4. We introduced some of the actual postings that result in costs being applied to a cost center and order, which we'll return to in Chapter 6, and some of the period-end close processes, which we'll return to in Chapter 7. We also looked at the underlying assumptions behind planning and budgeting, a subject we'll return to in Chapter 5. Finally we looked at the type of process controls that may be needed when working with CO. Our next step will be to look a little closer at the software to understand the reports available to support you in these tasks.

Index

A

- Access method
 - in queries, 413*
- Account
 - link to cost element, 25*
- Account assignment
 - for material issue, 272*
 - in purchase order, 260*
 - purchase for project, 308*
- Account assignment elements
 - for project, 181*
- Account-based CO-PA
 - introduction, 82*
- Accounting document
 - for goods receipt from purchasing, 262*
 - for incoming invoice, 266*
- Accounting principle
 - in alternative valuation run, 380*
- Accounting view
 - of material master, 147*
- Active availability control
 - for project, 308*
 - introduction, 47*
- Active budgeting, 47
- Activities
 - as basis for price calculation, 122*
 - dimension in SAP BusinessObjects PCM, 515*
 - in SAP BusinessObjects PCM, 500*
- Activity allocation
 - to project, 312*
- Activity-based Costing
 - introduction, 28, 498*
- Activity-dependent planning, 218
- Activity-independent cost
 - planning, 216*
 - target costs for, 348*
- Activity/output prices
 - planning, 213*
- Activity price
 - analysis of, 351*
- Activity price calculation, 228, 350
 - approaches, 121*
 - settings in activity type, 121*
- Activity quantity
 - as basis for planning, 205*
- Activity type
 - activity unit, 119*
 - in Material Ledger, 375*
 - in work center/resource, 174*
 - introduction, 117*
 - use in allocations, 326*
- Activity type groups, 122
 - in planning, 213, 216*
- Activity type plan
 - as service in Express Planning, 481*
- Actual costs, 32
 - business requirements, 77*
 - for production orders, 276*
 - material master, 196*
- Actual postings, 20, 257
- Adobe Interactive Form
 - change request, 140, 434*
- Allocation
 - cross-company, 189*
 - cycles overview, 331*
 - introduction, 326*
 - real-time integration of CO and Financial Accounting, 332*
 - using SAP BusinessObjects PCM, 497*
- Allocation template
 - in business process, 506*
- Alternative cost center hierarchies, 100
- Alternative valuation run
 - costing steps, 378*
 - introduction, 372*
 - link to Schedule Manager, 551*
- Annual budget, 203
- Annual operating plan, 203
- Apportionment structure

- for co-products, 162*
- in process order, 296*
- Appropriation requests, 185
- Approval
 - for change requests, 449*
 - workflow, 48*
- Approval year
 - for investment program, 183*
 - in investment planning, 253*
- Arm's length trading, 320
- Assessment cost elements, 334
 - use of, 337*
- Assessment cycles, 332
 - cyclical relationships, 338*
 - introduction, 98, 330*
- Asset Accounting
 - link with Cost Center Accounting, 94*
 - period close tasks, 328*
- Auditing
 - CO-PA reporting, 403*
- Auxiliary cost component split, 238

B

- Backflushing
 - distribution of usage variances, 289*
 - for production orders, 272*
- Background processing
 - for period close activities, 535*
- Balance sheet valuation
 - price fields, 151*
 - tax and commercial prices, 195*
- Basic view
 - of material master, 146*
- Batches, 155
- Billing
 - prior to period close, 328*
- Billing document
 - for sales order, 287*
- Billing elements
 - for project, 181*
- Bill of material
 - cyclical structures, 164*
 - in production order, 268*
 - introduction, 158*
 - long-term planning, 210*
 - material usage, 66*
 - recursive, 164*
 - usage, 158*
- Bottom-up planning, 248
- Budget change
 - change request, 431*
- Budget change request, 254
- Budget changes, 48
- Budgeting, 19
 - for projects, 251*
 - introduction, 43*
 - value flow, 46*
- Budget planning
 - for investment programs, 247*
- Budget request
 - change request, 431*
- Budget transfer request, 254, 431
- Business area
 - in cost center, 96*
- Business function
 - CO_ALLOCATIONS, 313*
 - FIN_ACC_LOCAL_CLOSE, 529*
 - FIN_CO_COGM, 196, 329, 350, 381*
 - FIN_GL_REORG_1, 94*
 - FIN_MDM_ACC, 437*
 - FIN_MDM_ORG, 437*
 - FIN_MDM_SOA_CU, 443*
 - FIN_MDM_SOA_ORG, 443*
 - FIN_REP_SIMPL_1, 61*
 - FIN_SSC_ISS_1, 453*
 - LOG_EAM_OLC, 173*
 - LOG_MM_SIT, 321*
 - LOG_PP_PROD_ORDER_SPLIT, 298*
- Business process
 - in allocations, 506*
 - introduction, 497*
 - master data, 501*
- Business Transaction
 - RKIU, 336*
 - RKP1, 463*
- Business unit analyst, 480
- By-products
 - in BOM, 161*

C

- Capacity
 - as basis for price calculation, 122*
 - in cost center planning, 213*
 - of cost center, 175*
 - of work center, 175*
- Capital investment projects
 - planning of, 246*
- Change documents
 - for master data, 134*
- Change request
 - action box, 434*
 - approval of, 449*
 - configuration, 430*
 - for budget, 254*
 - for cost center, 488*
 - form settings, 434*
 - master data governance, 443*
 - notification type, 433*
 - reviewing related requests, 448*
 - scenarios, 430*
 - shared service framework, 452*
- Characteristics
 - for profitability analysis, 282*
- Chart of accounts, 187
 - data model for SAP MDGF, 437*
 - link with primary cost elements, 186*
 - master data governance, 429, 436*
- Closing Cockpit
 - in period close, 528*
 - scheduling extracts for reporting, 391*
- Closing hierarchy
 - in Closing Cockpit, 553*
- Collective processing
 - during period close, 527*
- Commitments
 - for project, 310*
- Company code
 - in cost center, 95*
- Completed contract
 - valuation, 370*
- Conditions
 - for purchasing, 259*
- Configurable BOM, 165
 - classification, 165*
- Configurable material
 - manufacture of, 303*
- Configurable materials, 165
- Confirmation
 - for production orders, 275*
- Control key
 - for operation, 170*
- Controlling, 18
- Controlling document
 - for production order, 274*
- Co-products, 153
 - in BOM, 161*
 - in process orders, 295*
 - settlement rules, 162*
- Corporate Investment Management
 - planning activities, 464*
- Cost and activity inputs
 - planning, 215, 461*
- Cost center
 - approval processes, 34*
 - as account assignment, 34*
 - change request, 430*
 - difference from order, 90*
 - groups, 101*
 - hierarchies, 97*
 - introduction, 29*
 - link to work center, 173*
 - master data, 90*
 - master data governance, 437*
 - operational, 91*
 - output measure, 30*
 - outputs, 37*
 - purchasing costs, 34*
 - responsibility for, 29*
 - responsible managers, 92*
 - supporting, 91*
 - typical expenses, 36*
 - validity period, 136*
- Cost Center Accounting
 - actual postings, 313*
 - creating cost centers, 90*
 - introduction, 26*
 - line items, 52*
 - period close activities, 327*
 - planning, 211*
- Cost center change request, 488

- Cost center group
 - in Express Planning, 483*
- Cost center line item, 277
 - layouts for reporting, 55*
 - simplified reporting, 59*
- Cost center planning, 211
- Cost centers
 - finding cost centers in allocation cycles, 332*
- Cost components
 - for activity prices, 229*
 - introduction, 66*
- Cost component split
 - in Product Cost Planning, 238*
 - manual change to, 376*
- Costed multilevel BOM
 - report, 67*
- Cost element, 25
 - examples, 25*
 - primary, 25*
 - secondary, 25*
- Cost Element Accounting
 - introduction, 25*
 - master data, 124*
- Cost element category
 - for primary cost element, 188*
- Cost element group, 127
 - in planning, 216*
- Cost element master data
 - reports, 128*
- Cost element planning
 - for projects, 248*
 - new version in enhancement package 6, 476*
- Cost elements, 123
 - for goods issues and receipts, 274*
 - for recording WIP, 359*
 - in activity types, 119*
 - in primary cost component split, 229*
 - in product costing, 66*
 - in Profitability Analysis, 82*
 - link to cost components, 239*
 - link to SAP BusinessObjects PCM, 513*
 - master data governance, 437*
- Costing-based CO-PA
 - introduction, 82*
- Costing lot size, 151, 236
 - impact of scrap, 154*
 - in material master, 152*
- Costing run
 - in Material Ledger, 371*
 - introduction, 230*
- Costing sheet
 - in production order, 354*
- Costing variant
 - in Product Cost Planning, 233*
- Costing version
 - in Product Cost Planning, 233*
- Costing view
 - of material master, 151*
- Cost object controlling
 - master data, 131*
 - MRP class, 154*
 - period close activities, 351*
 - production orders, 270*
- Cost object hierarchy, 132
 - introduction, 75*
 - options at period close, 133*
- Cost objects
 - dimension in SAP BusinessObjects PCM, 516*
 - in SAP BusinessObjects PCM, 500*
- Cost of goods manufactured, 66
- Cost planning
 - introduction, 201*
- Country chart of accounts, 187
- Cross-company allocations, 189
- Cross-company costing, 196
- Cross-company postings, 319
 - allocations, 95*
- Crystal Reports
 - in SAP List Viewer, 421*
 - link to query, 418*
- Cumulation
 - in Material Ledger, 378*
- Currencies
 - for reporting, 59*
- Customer account
 - assignment in Customer master, 157*
- Customer invoice, 287
- Customer master, 156
 - reconciliation account, 285*

Customer value analysis
using SAP BusinessObjects PCM, 523
 Cycle run groups
for allocations, 338

D

Dashboard reports, 422
 Data modeling
master data governance, 437
 Data provisioning
in SAP NetWeaver BW, 412
 DataSources, 21
for controlling, 396
 Data warehousing
introduction, 395
 Dependencies
in period close, 532
 Depreciation, 328
cost center assignment, 36
 Derivation
in profitability analysis, 282
 Determine delta postings
in alternative valuation run, 379
 Direct access
using SAP NetWeaver BW, 398
 Direct activity allocation, 117
category of activity type, 120
correction of, 317
 Distribution cycles, 338
introduction, 330
 Distribution key
in planning, 218
 Distribution of activities, 293
 Distribution rules
settlement rules, 109
 Division
in material master, 148
 Drill-down reporting
in Cost Object Controlling, 393
in Profitability Analysis, 392
unassigned data, 415
 Driver-based planning, 43
 Drivers

for cost centers, 30
for products, 30

E

Edition
how to create, 440
list of, 441
master data governance, 438
 Enterprise Extension
EA_FIN, 290, 373, 376
 Entity types
use in MDGF, 437
 Environment
use in templates, 508
 Equipment
link with Cost Center Accounting, 94
 Equivalence numbers
for co-products, 164, 296
 Error handling
in period close, 550
 Exceptions and conditions
in SAP NetWeaver BW, 415
 Executable programs
for period close transactions, 536
 Expenses
to be capitalized, 38
 Express Planning, 21
change requests, 138
for cost center planning, 215
introduction, 479
order planning, 226
user responsible for cost center, 92
 Extracts, 388

F

Factory calendar
in Closing Cockpit, 555
 FIFO (first-in, first-out), 151
 Finished product, 158
 Fixed assets
depreciation, 328

Fixed costs, 29
 Fixed cost variances
 on cost centers, 350
 Floorplan Manager
 for planning applications, 475
 Flow definition
 for period close activities, 546
 Formatted reports
 using Crystal Reports, 420
 Form-based planning, 216
 Formula key
 in work center/resource, 173
 Free planning, 216
 Functional area
 in cost center, 96
 Future standard price
 in material master, 242
 marking/releasing, 242

G

General Ledger
 link to Cost Center Accounting, 95
 link with internal orders, 108
 Goods movements
 real-time valuation, 40
 Goods receipt
 for purchasing, 260
 Grenzplankostenrechnung (GPK), 28
 Group chart of accounts, 187
 Group costing
 use of costing versions, 234
 Group valuation
 for intercompany trade, 323
 in material master, 196

H

Hierarchy area
 for cost centers, 97
 High-Performance Analytic Appliance
 (HANA), 21, 424

I

Incoming invoice
 from vendor, 265
 Indirect activity allocation, 118
 category of activity type, 120
 for energy, 120
 in planning, 224
 Indirect activity allocation cycles, 341
 introduction, 330
 InfoArea
 in SAP NetWeaver BW, 396
 InfoObjects
 in SAP NetWeaver BW, 405
 InfoPackages
 for data extraction, 395
 InfoProviders, 21
 for corporate Investment Management, 464
 for planning, 463
 in SAP NetWeaver BW, 396
 Information system
 Cost Center Accounting, 53
 internal orders, 63
 product cost by order, 73
 product cost by period, 75
 product cost by sales order, 76
 product cost planning, 67
 Profitability Analysis, 83
 InfoSet queries, 416
 Input price variances
 for production orders, 362
 on cost centers, 349
 Input quantity variances
 for production orders, 362
 on cost centers, 350
 Intercompany trading, 321
 Intermediate → see Semifinished product
 Internal order line items, 62
 delivered layouts, 64
 Internal orders
 change request, 430
 introduction, 26
 master data, 105
 planning, 225
 reporting options, 63
 settlement rules, 108
 statistical, 110

status management, 136
 Internal service request, 21
 for master data changes, 137
 International Financial Reporting Standards (IFRS), 16
 Inventory
 introduction, 37
 Inventory counts
 handling of variances, 289
 recording of, 290
 Inventory valuation, 40
 scrap, 41
 work in process, 41
 Investment Management
 introduction, 32
 orders, 32
 planning, 247
 projects, 32
 Investment planning, 246
 Investment program, 33
 introduction, 183
 planning, 249
 Investment programs
 introduction, 246
 Item category
 in BOM, 159
 Itemization
 Delivered layouts, 69
 reporting options, 69

J

Job log
 for period close activities, 542
 in Web application for Closing Cockpit, 559
 Joint production, 153
 product cost by order, 295

K

Kilger, Wolfgang, 15

L

Layouts
 how to change, 56
 Lean accounting, 33
 introduction, 27
 value streams, 94
 Legal valuation
 in material master, 196
 intercompany goods movement, 321
 LIFO (last-in, first-out), 151
 Line items
 cost center, 54
 order line item, 64
 in SAP BusinessObjects PCM, 513
 List report, 54
 Long-term planning, 209
 Lot size
 for costing, 236
 for production order, 268

M

Main cost component split, 238
 Make-to-order production, 303
 Manager Self-Service
 internal orders for cost centers, 108
 user responsible for cost center, 92
 Manufacturing order → see Production order
 Marking
 of cost estimates, 242
 Master Data, 18
 controls, 47
 Governance, 21
 Master data reporting
 cost centers, 103
 Master recipe, 168
 Material account
 use of valuation class, 147
 Material group
 for sales order item, 282
 in material master, 146
 Material Ledger, 374
 activation of, 149

- cross-company trading*, 196
- in material master*, 148
- introduction*, 77
- performance*, 261, 375
- period close activities*, 371
- Material master, 144
 - master data governance*, 437
 - selection list for costing*, 235
 - views*, 145
- Material origin
 - use of checkbox*, 151
- Material types
 - in material master*, 145
- Material usage
 - for production orders*, 272
- Mixed costing
 - introduction*, 175
- Mixed price variances
 - for production orders*, 363
- Mixing ratios
 - for product costing*, 178
 - use of*, 239
- Model builder
 - in SAP BusinessObjects PCM*, 512
- Moving average price, 148
 - in combination with Material Ledger*, 150
- MRP variances
 - source of*, 268
- Multidimensional reporting
 - in Cost Center Accounting*, 403
 - in SAP NetWeaver BW*, 401
- Multilevel price determination, 373

N

- Navigation attributes
 - in SAP NetWeaver BW*, 404
- Networks
 - for projects*, 39
 - introduction*, 181

O

- Offset
 - timing of period close*, 535

- OLAP engine
 - use in planning*, 463
- Operating concern
 - dimensions used for planning*, 207
 - in SAP NetWeaver BW*, 399
 - introduction*, 80
 - link with cost objects in SAP BusinessObjects PCM*, 516
- Operating rate
 - for cost center*, 349
- Operational chart of accounts, 187
- Operational cost centers, 91
- Operation-level costing, 172
- Operations
 - BOM items for WIP calculation*, 360
- Operation values, 170
- Order confirmation
 - introduction*, 35
- Order groups, 111
- Order items
 - for co-products*, 296
- Order line items
 - simplified reporting*, 65
- Order lot size, 268
- Order master data
 - reporting options*, 112
- Order networks
 - use of*, 160
- Orders
 - typical expenses*, 38
- Order settlement
 - introduction*, 39
- Order split, 299
- Order to cash, 281
- Organization types
 - in Closing Cockpit*, 553
- Original budget
 - for projects*, 251
- Origin group
 - material master*, 151
- Outbound delivery
 - for sales order*, 285
- Output
 - of planning*, 205
- Output measure
 - for cost centers*, 30
 - for planning*, 30

- for products, 30*
- for work center, 174*
- Output parameters
 - for extracts, 391*
- Output price variances
 - for production orders, 363*
 - on cost centers, 350*
- Output side variances
 - on cost centers, 350*
- Outsourced manufacturing
 - with CO production orders, 299*
- Overall plan
 - investment planning, 247*
- Overall planning
 - in Express Planning, 494*
 - new version in enhancement package 6, 474*
- Overhead calculation
 - for production orders, 355*
- Overhead group
 - in material master, 152*
- Overhead key
 - in production order, 354*

P

- Parameters
 - for closing activities, 540*
- Partner cost component split, 66
- Partners
 - in an allocation, 58*
- Passive budgeting, 47
- Payroll costs
 - cost center assignment, 36*
- Percentage of completion, 42
 - valuation, 370*
- Period close, 20
 - automation of, 536*
 - introduction, 40*
 - process controls, 48*
 - use of SAP Financial Closing Cockpit, 527*
- Periodic costing run
 - costing steps, 372*
 - introduction, 372*
 - link to Schedule Manager, 551*
 - underlying data, 261*
- Periodic unit price
 - goods receipts for purchases, 261*
 - in costing run, 372*
 - in Material Ledger, 150*
- Personalization dialog
 - in Express Planning, 483*
- Person responsible
 - for cost center, 92*
- Physical InfoProviders
 - in SAP NetWeaver BW, 414*
- Physical inventory
 - handling of variances, 289*
- Physical inventory differences
 - distribution of, 292*
- PI document, 290
- P&L accounts
 - link to CO, 187*
- Plan integration
 - for internal orders, 225*
- Planned scrap
 - in BOM, 161*
 - settings in material master, 154*
- Planner profile in planning applications, 459
- Planning
 - driver-based, 43*
 - introduction, 43*
 - process controls, 48*
 - steps involved, 43*
 - supply and demand, 45*
- Planning area
 - for planning applications, 460*
- Planning elements
 - for project, 181*
- Planning functions
 - in SAP BW-BPS, 470*
- Planning instance
 - in Express Planning, 481*
- Planning layouts
 - for cost center planning, 215*
 - for secondary cost centers, 221*
 - in SAP SEM-BPS, 468*
- Planning options, 16
- Planning package
 - in profitability analysis, 207*
- Planning round
 - creation of, 480*
 - introduction, 479*
- Planning scenario

- for sales and operations plan, 209*
- in Express Planning, 481*
- Plan quantities
 - inclusion in template, 504*
- Plan reconciliation, 213
- Plan to manufacture, 267
- Plan version, 203
 - how to look, 245*
- Plaut, Hans-Georg, 28
- Post closing
 - in material ledger, 374*
- Preliminary cost estimate
 - for production order, 270*
- Price conditions
 - for intercompany sales, 196*
 - for purchasing, 259*
 - in purchasing info record, 195*
- Price control
 - in material master, 148*
- Primary cost component split, 66
 - for product costs, 238*
 - in planning, 229*
 - use of, 175*
- Primary cost distribution, 338
- Primary cost elements, 25, 124, 186
 - in distribution cycles, 339*
- Primary cost planning
 - as service in Express Planning, 481*
- Primary cost postings
 - reporting options, 57*
- Prior year rates, 313
- Process controls
 - period close, 48*
 - planning, 48*
 - Price Calculation in Material Ledger, 375*
- Process costs
 - in product costing, 501*
- Procurement alternative, 175
 - product cost collector, 300*
- Procure-to-pay
 - introduction, 258*
- Product cost by order, 295
 - introduction, 72*
 - period close activities, 352*
- Product cost by period, 300
 - introduction, 74*
- Product cost by sales order
 - introduction, 76*
 - period close activities, 369*
- Product cost collector, 130
 - introduction, 74*
 - product cost by period, 300*
 - variance calculation, 365*
- Product Cost Controlling
 - introduction, 27*
- Product costing, 15
 - reporting options, 65*
- Product Cost Planning, 230
 - Procurement Alternatives, 239*
- Product costs
 - Simplified Reporting, 71*
- Product costs by period
 - product cost collectors, 130*
 - period close activities, 360*
- Product costs by sales order, 302
- Product hierarchy
 - for sales order item, 282*
 - in material master, 146*
- Production alternatives, 130
- Production campaigns
 - reporting options, 73*
- Production order, 268
 - introduction, 299*
 - reporting options, 72*
 - settlement, 279*
- Production plan, 209
- Production quantity
 - as basis for planning, 205*
- Production variances
 - calculation of, 362*
 - sources of, 276*
- Production version
 - in material master, 152*
 - product cost collector, 131, 300*
 - reporting options, 74*
- Product roll-up
 - via BOM, 159*
- Profitability Analysis
 - allocations to, 343*
 - Billing Document, 287*
 - BW content, 399*
 - direct posting from FI, 263*

- drill-down reports, 84*
- introduction, 80*
- planning, 205, 245*
- Period close activities, 384*
- reporting options, 83*
- sales order entry, 281, 282, 306*
- settlement to, 368*
- Profitability planning, 245, 462
- Profit center
 - cost center, 96*
 - in material master, 152*
 - in purchase order, 260*
- Program variant
 - generation of, 543*
- Program variants
 - in workflows, 548*
 - use of in period close, 539*
- Project
 - account assignment, 148*
 - change request, 430*
 - controlling, 307*
 - definition, 179*
 - introduction, 39, 179*
 - line items, 311*
 - size, 182*
 - stock*
- Proportional costs, 29
- Purchase order
 - purchase to stock, 258*
- Purchase price variances
 - in procure-to-pay process, 259*
- Purchasing info record, 193
 - in purchase order, 258*
 - use of conditions in costing, 195*

Q

- Quantity structure
 - in Material Ledger, 79*
 - link to BOM, 159*
- Queries
 - for Profitability Analysis, 410*
 - for SAP BusinessObjects tools, 418*
 - in SAP NetWeaver BW, 397*

R

- Rate routing, 168
- Raw material, 160
- Receiver cost centers
 - in planning, 221*
- Receiver rule
 - allocations to Profitability Analysis, 344*
 - assessment cycle, 334*
- Receivers
 - allocations, 99*
 - in an allocation, 58*
- Reconciliation ledger, 95
- Record types
 - in Profitability Analysis, 80*
- Recursive BOMs, 164
- Reference order
 - use of, 105*
- Release
 - of cost estimates, 242*
 - production order, 271*
- Remote tasks
 - for period close activities, 562*
- Replicated data
 - in SAP NetWeaver BW, 398*
- Reporting, 18
 - introduction, 51*
- Report Writer
 - use of extracts, 388*
- Reposting cycles, 340
 - introduction, 330*
- Reposting line items, 314
- Reposting values, 318
- Requirements type
 - in sales order, 304*
- Resource drivers
 - in SAP BusinessObjects PCM, 518*
- Resources
 - in process industry, 173*
 - in SAP BusinessObjects PCM, 500*
 - supply and demand, 31*
- Resource-usage variances
 - for production orders, 363*
 - on cost centers, 350*
- Responsibility accounting, 27

- Responsible centers
 - in SAP BusinessObjects PCM, 514*
 - Responsible cost center
 - internal order, 108*
 - Responsible managers
 - in Express Planning, 487*
 - Results analysis
 - introduction, 42*
 - revenue-based, 42*
 - Results analysis cost elements, 359
 - Results analysis key
 - in production order, 354*
 - Results analysis version
 - use of, 358*
 - Revaluate at actual prices, 351
 - Revaluation
 - in Profitability Analysis, 384*
 - of consumption, 373*
 - Revision phase
 - in Express Planning, 493*
 - Rework
 - confirmation of, 275*
 - for production order, 298*
 - Routing, 168
 - in production order, 270*
 - long-term planning, 210*
 - manufacturing steps, 66*
 - work in process calculation, 360*
- S**
-
- Sales and operations plan, 205
 - transfer from CO-PA, 209*
 - Sales order, 281
 - Sales order controlling
 - period close activities, 369*
 - Sales order costing
 - reporting options, 76*
 - Sales order stock, 303
 - account assignment, 147*
 - introduction, 76*
 - unvaluated, 370*
 - valuated, 370*
 - Sales planning, 206
 - Sales quantity
 - as basis for planning, 205*
 - SAP BusinessObjects, 20
 - SAP BusinessObjects Explorer
 - for profitability reporting, 424*
 - SAP BusinessObjects Profitability and Cost Management
 - introduction, 498*
 - options for loading data, 510*
 - SAP Catch Weight Management
 - equivalence numbers for co-products, 164*
 - multiple units of measure, 146*
 - SAP Central Processing by Redwood, 560
 - SAP Cost and Profitability Management, 21
 - SAP ERP General Ledger
 - Cost Center Accounting, 95*
 - SAP Financial Closing Cockpit, 22
 - introduction, 529*
 - Web application, 557*
 - SAP List Viewer, 54
 - Crystal Reports, 421*
 - layouts, 55*
 - tree report, 69*
 - SAP Master Data Governance for Financials, 429
 - introduction, 436*
 - SAP NetWeaver BW, 20, 396
 - SAP SEM, 21
 - SAP Shared Service Framework, 429
 - Sarbanes-Oxley Act, 47
 - master data compliance, 137*
 - Scheduled activity, 213
 - in long-term planning, 210*
 - transfer from SOP/LTP, 214*
 - Schedule Manager
 - for planning, 206*
 - in period close, 528*
 - scheduling extracts for reporting, 391*
 - Schedule Manager Monitor
 - use of, 545*
 - Scheduling
 - for period close activities, 541*
 - Scrap
 - calculation of, 366*
 - confirmation of, 275*
 - introduction, 41*
 - Secondary cost element, 25, 124

- use, 125*
- Secondary postings
 - reporting options, 58*
- Segments
 - within allocation cycles, 332*
- Selection list
 - for costing run, 234*
- Selection variants
 - internal orders, 106*
- Semifinished product, 160
- Sender cost centers
 - in planning, 221*
- Sender rule
 - for assessment cycle, 333*
 - for indirect activity allocation cycles, 341*
- Senders
 - allocations, 99*
 - in an allocation, 58*
- Sending emails in Express Planning, 486
- Settlement, 367
- Settlement rule
 - automatic generation, 110*
 - for production order, 306*
 - internal orders, 108*
- Shared service center
 - introduction, 452*
- Simplified reporting
 - order master data, 112*
 - cost center line item, 59*
 - Cost Centers, 103*
 - order line items, 65*
 - product costs, 71*
- Simulation
 - using SAP BW-BPS, 471*
- Single-level price determination, 373
 - in Material Ledger, 150*
- Source structure
 - in joint production, 162*
- Special procurement key
 - in material master, 153*
- Splitting
 - of production orders, 298*
- Splitting cost center costs, 219
- Split valuation
 - for batches, 156*
- Spoilage, 41
 - in BOM, 161*
- Spool list
 - for period close activities, 543*
 - in Web application for Closing Cockpit, 559*
- Stakeholder, 19
- Standard cost center hierarchies, 97
- Standard cost estimate
 - in material master, 148*
- Standard costs, 30
 - for raw materials, 192*
 - use of costing run, 231*
 - variances, 31*
- Standard price, 148
 - marking/releasing, 242*
- Standard routing, 168
- Standard-setting
 - in planning, 201*
- Standard values
 - in operation, 170*
- Star schema
 - for multidimensional reporting, 401*
- Statistical internal orders, 110
- Statistical key figure
 - as service in Express Planning, 481*
 - groups, 117*
 - introduction, 114*
 - use in assessment cycles, 334*
- Status
 - for an internal order, 136*
 - in Express Planning, 489*
- Status management
 - for internal orders, 136*
 - for orders and product cost collectors, 136*
- Stock
 - unrestricted use, 260*
- Stock in transit, 320
 - valuation of, 375*
- Stock revaluation
 - release of standard costs, 240*
- Stock transfer order, 320
- Structure explosion
 - in Product Cost Planning, 236*
- Summarization levels
 - in Cost Object Controlling, 393*
 - in Profitability Analysis, 392*
- Supplier

Index

master data governance, 437
Supporting cost center
indirect activity allocation cycles, 341
use of, 338
Supporting cost centers, 91
cost center planning, 220

T

Target costs
for product cost collector, 300
for production orders, 361
on cost centers, 347
Target Cost Version, 361
Task list
for period close, 533
Template
definition, 508
display in product costing, 502
Template allocation
as part of period close, 507
instead of overhead calculation, 356
Templates
for period close, 532
Time buckets
in planning applications, 489
Time dependency
in BOM, 159
Time-dependent data
Asset Accounting, 94
Time-dependent fields
for cost centers, 135
Time recording
by order, 35, 39
by project, 35
to project, 310
Time sheet
data entry, 310
Top-down distribution
in Profitability Analysis, 385
Top-down planning
for investments, 248
Totals record
Cost Center Accounting, 61
Transaction, 16
C203, 169
CA03, 168
CA23, 168
CAT2, 310
CAT5, 311
CJ13, 311
CJ20N, 180
CJ30, 252
CJ40, 248, 474
CJR2, 249, 460, 476
CK40N, 231
CK91N, 176
CK94, 178
CKM3N, 78
CKMATCON, 234
CKMATDUV, 292
CKMCCD, 376
CKMDUVACT, 294
CKMDUVREC, 293
CKMLCP, 372
CKMLCPAVR, 378
CKMLQS, 276
CLOCOC, 530
CLOCOT, 534
CO01, 268
CO8B, 298
CO15, 272
CON2, 351
COR1, 295
CP01, 501
CPT1, 508
CR03, 173
CRC3, 173
CS03, 159
EXP_CUST, 482
FSSO, 187
IM32, 251
IM34, 183, 249
IM52, 252
KA01, 124
KA06, 124
KA23, 128
KALC, 95
KB11N, 318
KB21N, 312
KB61, 314
KB65, 317
KE24, 282

KE27, 385
 KE28, 385
 KEPM, 205, 245, 462
 KEU2, 344
 KEU5, 347
 KGI2, 356
 KK01, 115
 KK87, 367
 KKAS, 360
 KKAX, 358
 KKBC_ORD, 359
 KKF6N, 131
 KKPHIE, 133
 KKS2, 362
 KKS6, 365
 KL01, 118
 KL13, 123
 KLH1, 122
 KLH2, 127
 KO04, 105
 KOB1, 64
 KOH1, 111
 KP04, 459
 KP06, 215, 459
 KP26, 213, 459
 KPF6, 226, 459
 KPSI, 214
 KS01, 90
 KSB1, 53
 KSBL, 222
 KSBT, 351
 KSC2, 341
 KSC5, 342
 KSH1, 101
 KSII, 350, 380
 KSPI, 227
 KSPP, 214
 KSS4, 219
 KSU2, 98, 332
 KSU5, 336
 KSV2, 339
 KSV5, 339
 ME13, 193
 ME21N, 259
 MI01, 290
 MI04, 290
 MI07, 291

MIGO, 260
 MIRO, 265
 MM03, 146
 MS01, 210
 OKEON, 98
 RKIL, 342
 RKIV, 340
 RKU3, 317
 RSA3, 396
 XD01, 157
 XK01, 197
 Transaction-based price determination
 in Material Ledger, 150
 Transfer control
 in Product Cost Planning, 234
 Transient InfoProviders
 for reporting, 416
 Travel expenses
 cost center assignment, 36

U

Unit of measure
 for material master, 146
 in material master, 146
 User exit
 COOMKS01, 93
 User responsible
 for cost center, 92

V

Valuated Quantity Structure report, 276
 Valuation
 during planning, 207
 Valuation class
 for materials, 147
 Valuation function
 in Profitability Analysis, 384
 Value fields
 for profitability analysis, 283
 in Profitability Analysis, 82
 Value flows
 in Controlling, 28
 Value streams

Index

- cost center assignment, 94*
- Variable costs, 29
- Variables
 - for organizational units, 554*
- Variance analysis
 - introduction, 325*
- Variance calculation
 - for cost centers, 347*
 - for product cost collectors, 366*
- Variance key
 - in material master, 152*
 - in production order, 354*
- Variances
 - settlement of, 279*
- Variation
 - in Report Writer reports, 390*
- Vendor master, 197
- Version
 - for sales and operations plan, 209*
 - plan version, 203*
 - purpose of, 204*
 - use in period close, 329*
- Views
 - in BW queries, 414*
- Virtual InfoProviders
 - in SAP NetWeaver BW, 413*

W

- WBS element, 180
 - change request, 430*
- Web queries
 - for planning, 464*

- Weighted average price
 - in Material Ledger, 150*
 - using Material Ledger, 148*
- Where-used lists
 - for cost centers, 103*
- Work breakdown structure, 20, 39
 - elements, 179, 180*
- Work center, 173
 - in production order, 270*
 - link with Cost Center Accounting, 95*
- Workflow
 - approvals, 48*
 - for period close activities, 546*
- Working time
 - recording of, 310*
- Work in process
 - account determination, 190*
 - calculation of, 357*
 - for product cost collectors, 360*
 - introduction, 41*
- Work lists
 - for period close activities, 546*
- Work orders
 - reporting options, 72*

X

- xCelsius dashboard, 422

Z

- Zero-based planning, 206