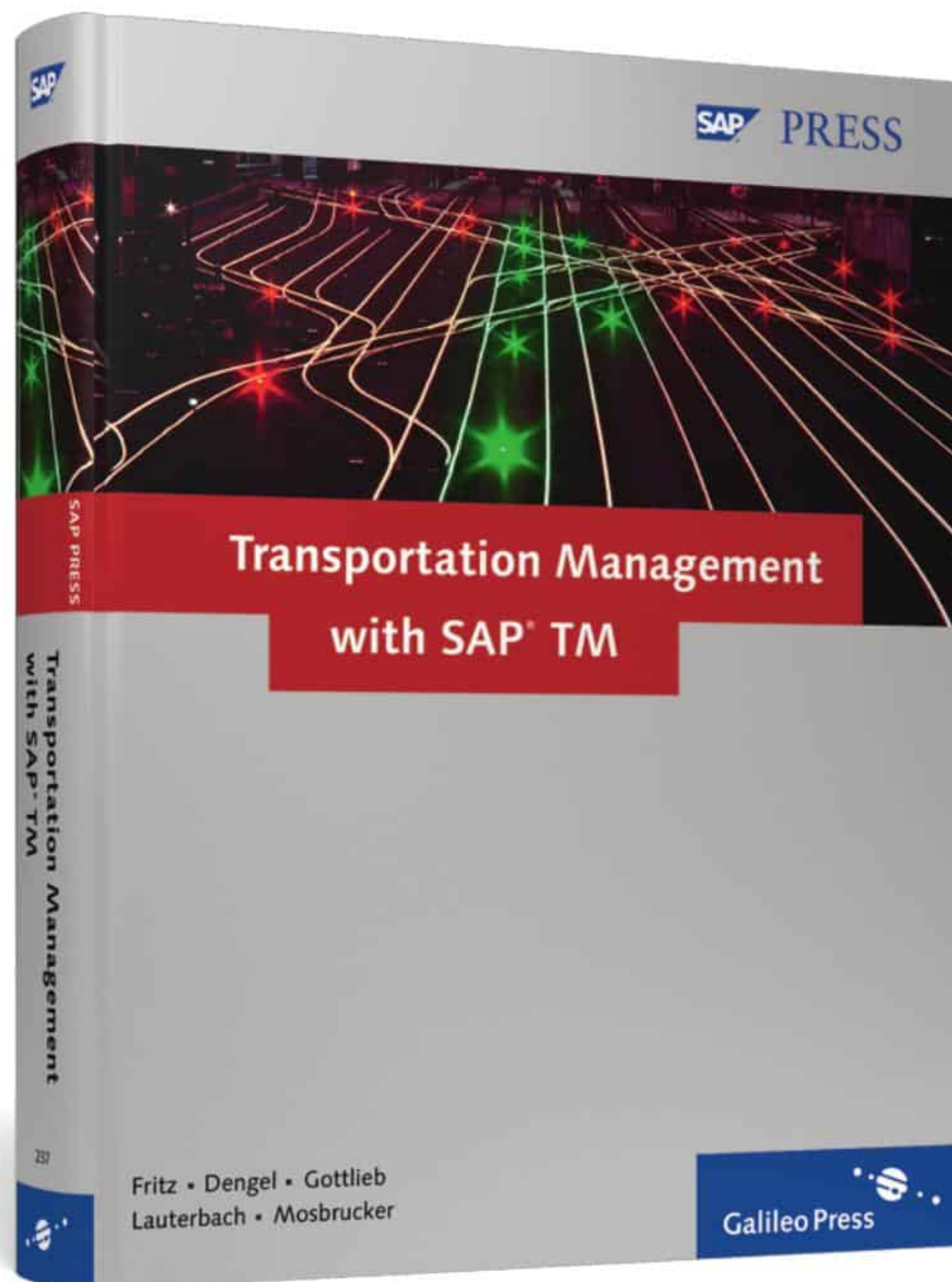


Bernd Lauterbach, Rüdiger Fritz, Jens Gottlieb,
Bernd Mosbrucker, Till Dengel

Transportation Management with SAP® TM



 Galileo Press

Bonn • Boston

Contents at a Glance

1	Introduction to Transportation Logistics	17
2	Overview of SAP TM 6.0	65
3	Organizational Structures and General Master Data ...	99
4	Logistical Master Data	119
5	General Tools	157
6	Order Management	173
7	Planning and Optimization	253
8	Subcontracting	315
9	Calculating Transportation Charges	357
10	Invoicing Transportation Charges	467
11	Analytics	495
12	SAP Event Management	505
13	Event Management Processes	539
14	Transportation Processes	555
15	Technological Foundations	613
16	Conclusion	637
A	Bibliography	639
B	The Authors	641

Contents

Foreword	17
1 Introduction to Transportation Logistics	17
1.1 Logistics Service Providers	19
1.1.1 Third Party Logistics (3PL)	19
1.1.2 Carriers	22
1.2 Transportation Logistics in the Shipper and Manufacturing Industries	24
1.2.1 Changing Roles in Logistics	25
1.2.2 Factors Influencing Processes in the Consignment Industry	31
1.2.3 Degree of Standardization for Each Mode of Transport	34
1.3 Typical Transportation Processes	39
1.3.1 Process	39
1.3.2 Modes of Transport	44
1.3.3 Freight Volume	48
1.4 Legal Requirements and Documents in Transportation	49
1.4.1 Regulations Governing Drivers	49
1.4.2 The Operational Contract between the Ordering Party and the Contractor	55
2 Overview of SAP TM 6.0	65
2.1 History of Transportation Management Software at SAP	65
2.1.1 Transportation Planning with the Transportation Planning and Vehicle Scheduling (TP/VS) Component	68
2.1.2 Additional Components	68
2.2 Initiative for the Development of the New SAP Transportation Management Solution	70
2.3 Components of the New SAP Transportation Solution	72
2.3.1 Master Data	72
2.3.2 Order Management	72
2.3.3 Planning and Optimization	73
2.3.4 Subcontracting	74
2.3.5 Transportation Charge	74
2.3.6 Transportation Charge Settlement	75
2.3.7 Analytics	75

2.3.8	Supply Chain Event Management (SCEM)	76
2.4	Interaction of Components	77
2.4.1	Integration of the SAP TM Lifecycle into Logistics and Supply Chain Management	77
2.4.2	Business-Process-Oriented Core Elements of the Solution	80
2.4.3	Integration into Existing Scenarios with the SAP Business Suite	82
2.4.4	Transportation Scenarios à la carte – SAP ERP and SAP TM	83
2.5	New User Interface	88
2.5.1	SAP NetWeaver Business Client (NWBC)	89
2.5.2	Screen Areas of the NetWeaver Business Client	91
2.6	Possible System Landscapes with SAP TM	94
3	Organizational Structures and General Master Data ...	99
3.1	Basic Settings	99
3.2	Organizational Units of a Transportation Service Provider ...	99
3.3	Product Master Data	104
3.3.1	Precisely Defined Products in Third-Party Logistics ...	105
3.3.2	Standardized Freight Codes and Material Groups ...	106
3.3.3	Roughly Defined Product Categories	107
3.3.4	Categories of Transport Equipment	108
3.3.5	Service Products	108
3.4	Business Partners	109
3.5	Internal Business Partners in a Distributed Logistics Organization	112
3.6	Transfer of Master Data between SAP ERP and SAP TM (Core Interface, CIF)	113
3.6.1	Technical Preparation in SAP ERP	114
3.6.2	Technical Preparation in SAP TM	115
3.6.3	Application-Specific Preparation	116
3.6.4	Integration Model and Selection Model	116
4	Logistical Master Data	119
4.1	Transportation Network	119
4.1.1	Locations	120
4.1.2	Transportation Zones and Transportation Zone Hierarchy	124
4.1.3	Transportation Lanes	127
4.1.4	Transshipment Locations	134
4.1.5	Schedules	137

4.2	Resources	142
4.2.1	Means of Transport and Vehicle Resources	143
4.2.2	Transportation Unit Resources	145
4.2.3	Drivers	145
4.2.4	Calendar Resources and Handling Resources	146
4.2.5	Maintaining Resources and Means of Transport	146
5	General Tools	157
5.1	Conditions	158
5.2	Post Processing Framework (PPF)	161
5.3	Incompatibilities	170
6	Order Management	173
6.1	Order Objects and the Order Receipt Process in SAP TM ...	173
6.1.1	Order Receipt	176
6.1.2	Data Areas in the Business Object "Shipment Request"	178
6.2	Personal Object Work List in Order Management	180
6.2.1	Personalization of the Personal Object Work List ...	182
6.2.2	Defining Queries	184
6.3	Business Object Structures in the Shipment and Freight Request	185
6.3.1	Business Object Nodes of the Shipment Request ...	186
6.3.2	Business Object Structure of the Freight Request ...	189
6.3.3	Use of Role Codes and Type Codes	190
6.4	Shipment Request Views	191
6.4.1	Detail View of the Shipment Request	192
6.4.2	Basic View of the Shipment Request	194
6.4.3	Document Status	195
6.4.4	Overview	197
6.4.5	Detail Data for Overview	198
6.4.6	Item Data	204
6.4.7	Business Partners	211
6.4.8	Packaging	212
6.4.9	Resources (Transportation Units and Vehicles)	213
6.4.10	Shipment Stages	214
6.4.11	Notes and Dossier	216
6.4.12	Charges and methods of payment	218
6.4.13	Governmental Procedures	220
6.5	Associated Document Information	220
6.5.1	Freight Units	220

6.5.2	Execution Information	220
6.5.3	Transportation Activities	220
6.5.4	Customer Freight Invoice	221
6.5.5	Tracking and Tracing	221
6.6	Checking and Activating the Shipment Request	222
6.7	Freight Units and Their Creation	223
6.8	Transportation Proposal	228
6.9	Transportation Revenue Determination	231
6.10	Confirmation	233
6.11	Printing Documents	234
6.12	Communication (Email, Fax, Messages)	235
6.13	Customer Freight Invoice	236
6.14	Freight Request	237
6.15	Quotation	240
6.16	Shipment Template	240
6.17	Shipment	242
6.18	Number Ranges and Tracking Numbers	245
6.19	Customizing	246
6.19.1	Role and Type Codes	246
6.19.2	Shipment Request Type	246
6.19.3	Print Documents Post Processing Framework	248
6.19.4	Incoterms	249
6.19.5	Text Types and Text Determination Procedures	249
6.20	Further Functions in SAP TM 7.0	250
6.20.1	New Shipment Request User Interfaces	250
6.20.2	Customer Fact Sheet	251
6.20.3	Additional Functions in Order Management Area	251

7 Planning and Optimization 253

7.1	Transportation Activities	254
7.2	Planning Strategies	258
7.3	Selection Settings	260
7.3.1	Requirements Profile	262
7.3.2	Time-Related Selection Attributes	262
7.3.3	Geographical Selection Attributes	264
7.3.4	Additional Selection Attributes	265
7.4	Planning Settings	267
7.4.1	Planning Profile	268
7.4.2	Capacity Selection	269
7.4.3	Pick-Up/Delivery Windows	271
7.4.4	Planning Costs	273
7.4.5	Optimizer Settings	277

7.4.6	Settings for TSP Selection	279
7.4.7	Time Constraints	283
7.4.8	Settings for SFT Builder	284
7.5	Planning	289
7.5.1	Configuring the Planning Interface	291
7.5.2	Planning Interface	295
7.5.3	Manual Planning	298
7.5.4	Load Planning	303
7.5.5	Optimizer Planning	304
7.5.6	Transportation Proposals	306
7.6	Optimization Algorithm	309

8 Subcontracting 315

8.1	Booking Order	317
8.2	Shipment Order and Freight Order	321
8.3	Transportation Allocations	331
8.4	Transportation Service Provider Selection	338
8.4.1	Manual and Automatic Transportation Service Provider Selection	338
8.4.2	Incompatibilities and Continuous Moves	343
8.4.3	Optimizer for Transportation Service Provider Selection	345
8.5	Tendering	348

9 Calculating Transportation Charges 357

9.1	Calculating Transportation Charges within Subprocesses ...	358
9.1.1	Order Receipt	359
9.1.2	Subcontracting and Calculating Transportation Charges	401
9.1.3	Transportation Charge Calculation for Planning and Automated Transportation Service Provider Selection	409
9.2	All Master Data for the Calculation of Transportation Charges	411
9.2.1	Overview and Interaction of Objects	411
9.2.2	Freight Agreement	415
9.2.3	Tariff	418
9.2.4	Rule Maintenance	422
9.2.5	Determination Logic for Freight Agreements and Tariffs	432
9.2.6	Transportation Charge Calculation Sheet	437
9.2.7	Transportation Charge Rate Tables and Scales	455

10 Invoicing Transportation Charges	467
10.1 Creating and Processing Invoice Requests	468
10.1.1 Transferring the Customer Freight Invoice Request	475
10.1.2 Transferring the Supplier Freight Invoice Request ...	478
10.1.3 Identifying the Recipient System	482
10.2 SAP ERP Configuration	484
10.2.1 Billing Documents	485
10.2.2 Invoice Verification	488
10.2.3 Customizing for SAP TM Assignment Tables	490
11 Analytics	495
11.1 Reports and Dashboards	495
11.2 Data Extraction from SAP TM	499
11.2.1 Post Processing Framework (PPF) Settings	500
11.2.2 SAP NetWeaver BW Structures	502
11.2.3 Queries	503
12 SAP Event Management	505
12.1 Overview and Functions	505
12.1.1 Business Process Types	510
12.1.2 Application Objects	511
12.1.3 Event Types	514
12.1.4 Application Log	515
12.2 Event Handlers and Event Messages	516
12.3 Event Handler Settings	520
12.3.1 Basic Event Handler Settings	520
12.3.2 Profiles for Expected Events	523
12.3.3 Status Profiles	524
12.3.4 Additional Event Handler Data	525
12.4 Event Processing	525
12.4.1 Technical Functions for Receiving Event Messages	526
12.4.2 Establishing Rule Sets	527
12.5 Information Output and Input Using SAP Event Management	530
12.5.1 Event Handler List	530
12.5.2 Data Input for Event Messages	533
12.5.3 Event Confirmation	534

12.5.4	Expected Events Overdue List	534
12.5.5	Web Interface	535

13 Event Management Processes 539

13.1	Order Status Tracking	540
13.2	Shipment Tracking	542
13.3	Vehicle and Transport Equipment Tracking	544
13.4	Tour Status Tracking	546
13.5	Tendering Tracking	547
13.6	Enhancement of Tracking Processes	551
13.6.1	Enhanced Business Process Types	552
13.6.2	Additional Application Object Types	552
13.6.3	Additional Extractors and Relevance Conditions ...	553
13.6.4	Additional Event Handler Types	553
13.6.5	Expansion of the Rules	554
13.6.6	Enhancement of SAP Event Management– Triggered Control Functions in SAP TM	554

14 Transportation Processes 555

14.1	Handling of a Full Container in Sea Freight (FCL)	556
14.1.1	FCL Transportation Order	556
14.1.2	Organizational Structure	557
14.1.3	FCL Transportation Process	559
14.1.4	Defining the Transportation Network	562
14.1.5	Entering a Booking Order for Freight Space by the Sea Freight Dispatcher	566
14.1.6	Receiving the Shipment Request by the Transportation Booking Agent	568
14.1.7	Further Processing of the Shipment Request by the Transportation Booking Agent	572
14.1.8	Planning the Sea Freight Stage	576
14.1.9	Subcontracting of the Sea Freight Stage	577
14.1.10	Generating the House Sea B/L (Shipment)	578
14.1.11	Planning, Tendering, and Subcontracting of the Pre-Carriage (Truck)	580
14.1.12	Planning and Subcontracting the On-Carriage (Truck)	585
14.1.13	Invoice Processing for the Service Provider Invoicing	585
14.1.14	Profitability Calculation and Order Completion	586

14.2	General Cargo Transportation (LTL) via Distribution Centers	587
14.2.1	LTL Transportation Order	588
14.2.2	Defining the Transportation Network	589
14.2.3	Receiving the LTL Shipment Request by the Transportation Booking Agent	594
14.2.4	Preplanning the LTL Shipment Request	596
14.2.5	LTL Costing with Split Charges	598
14.2.6	Shipment Tracking	601
14.3	Template Booking for Sea Freight	601
14.3.1	Product Data	602
14.3.2	Personal Object Work List for Shipment Templates	603
14.3.3	Creating a New Shipment Request	603
14.3.4	Routing and Transportation Charge Determination	606
14.4	Multimodal Routing of a Shipment	607
14.5	Demurrage and Detention	610
15 Technological Foundations		613
15.1	Business Object Modeling	613
15.2	Enterprise Services in SAP TM	620
15.2.1	Benefits of SOA	621
15.2.2	Enterprise Services in SAP TM	625
15.2.3	Information on Enterprise Services in the SAP Developer Network	632
15.3	BADIs in SAP TM	635
16 Conclusion		637
Appendices		639
A	Bibliography	639
B	Authors	641
	Index	643

Foreword

The transportation of goods is an age-old topic that has affected and connected people from different continents and regions since time immemorial. Today, the economy and thus modern man are wholly reliant on efficient transportation logistics. Even simple things required on a daily basis are procured from other continents. Because the global energy situation is worsening and energy procurement is becoming more and more cost-intensive, along with the fact that the number of services associated with transportation logistics is set to rise rather than fall, it is now more important than ever to organize and execute transportation logistics processes in an efficient, cost-conscious, and energy-conscious manner.

The new SAP Transportation Management (SAP TM) solution, which SAP introduced to the software market in November 2007, is an important building block of well-organized and energy-efficient transportation logistics that are linked to business partners. As a result of its modern architecture, which is based on Enterprise Services, SAP TM provides consignors and logistics service providers with the ideal platform for a modern transportation processing structure.

SAP TM

This book is intended for readers who already have an understanding of SAP TM and now want to configure SAP TM and use it specifically to implement logistics business processes. It aims to provide IT decision-makers, consultants, and users active in the transportation process environment with an overview of SAP TM 6.0 and detailed instructions and guidelines for working with SAP TM 6.0. The experiences of SAP TM architects, developers, and product managers have been documented to grant you a considerable insight into application-oriented process handling and the technical background of SAP TM and its functions.

This book covers the following subject areas in detail:

Subject areas

- ▶ Introduction to transportation logistics
- ▶ Overview of SAP TM 6.0


- ▶ General master data and logistics master data
- ▶ Order management and subcontracting
- ▶ General planning and dispatching
- ▶ Calculation and settlement of freight costs
- ▶ Analytics
- ▶ Event management in transportation
- ▶ Sample processes
- ▶ Technical basics of SAP TM 6.0

This book is founded on the expertise of many SAP colleagues to whom we would now like to extend our thanks: Thorsten Bender, Bernd Dittrich, Andreas Esau, Holger Hüne, Heidi Johann, Christine Kettner, Thomas Lang, Anna Luther, Gabor Nemes, Dominik Ofenloch, Dirk Schiebeler, Uwe Schönwald, Marlene Schumacher, Hergen Siefken, Thomas Steiner, Holger Thiel, Lars Vogel, and Marcus Zahn.

For their excellent care, we would like to thank Mirja Werner, Eva Tripp, Frank Paschen, and Meg Dunkerley from the publisher's side.

In particular, we would like to express our special thanks to our wives and partners Inga Dengel, Claudia Fritz, Yumi Kawahara, Mirjam Kühnlein, and Pia Penth, whose patience and active support made it possible for us to complete this book.

**Bernd Lauterbach, Rüdiger Fritz, Jens Gottlieb,
Bernd Mosbrucker, and Till Dengel**



Transportation logistics — an essential component of business process networks — is becoming even more important thanks to globalization and inventory cost optimization. In the past, enterprises have optimized and standardized internal processes extensively. We will also witness similar trends in transportation in the years to come.

1 Introduction to Transportation Logistics

In this book, we will address the topic of transportation management in the context of global logistics networks. We will discuss both the business background and SAP system mapping including specific system settings. SAP's *Transportation Management (TM)* software will be at the heart of our description. SAP TM is part of the SAP Supply Chain Management platform and consists of business processes that concern the assignment, planning, and settlement of transportation services.

We'll consider transportation from the perspective of different business models, that is, from the viewpoint of both logistics service providers and carriers, and from the viewpoint of consignors. Both business models have many special features in relation to the business process, each of which we'll examine from a business and software perspective. We'll also describe the interrelationships between different business partners within a network. Finally, we'll discuss inter-enterprise collaboration and the division of business processes.

Transportation is a very old business process that has spawned large enterprises and contributed significantly to the world's economic advancement. If we think of the logistical challenges that had to be surmounted when conquering foreign lands, we think of the lines of communication that had to be developed and the weapons, materials, and provisions that had to be transported. Another impressive example is how railroads helped open up America, a process that would have taken

Transportation
historically

much longer if the railroad connection hadn't been established between the East and West.

Importance of transportation today

Transportation and logistics also play an important role today. For example, the need for transportation has increased immensely as a result of the trend to outsource services and to relocate production facilities to Asia. Of course, this need has also resulted in increased transportation costs in terms of overall logistics costs, which is why there is increasingly a focus on the standardization and optimization of transportation logistics.

Commoditization of transportation services

In recent years, the transportation service has become increasingly commoditized. Both a relatively easy time-to-market for new providers and increasing market globalization and liberalization have made it possible for new competitors to continuously enter the market, resulting in a decline in prices for relatively simple transportation services. At the same time, there is an increase in the demand for transportation services as a result of globalization and the relocation of production to low-cost countries. Transportation resources, in other words, the means of transport, are becoming increasingly scarce while the mode of transport is becoming more and more significant.

Transportation management is never an isolated process. Rather, it is always integrated into other business processes. If transportation management is poorly organized, this may impact negatively on related business processes (for example, production supply).

Transportation management within a network

Transportation may have been an isolated business process in the past, but it is now increasingly considered within the context of overall networks and logistics processes, in the knowledge that transportation management still offers great optimization potentials.

If you consider value chains, from start to finish, it quickly becomes apparent that they actually no longer concern chains, but networks (see Figure 1.1). Therefore, processes no longer run sequentially. Instead, some processes run in parallel, are increasingly subcontracted to third parties, and are divided into subprocesses. The number of participants in a business process is on the rise, and the coordination and reconciliation efforts are much greater than they were for horizontal value chains processed within an enterprise.

The term *business process network transformation* describes the evolution of horizontal value chains into value networks in which a large number of highly specialized enterprises contribute to the overall added value of the goods in question. This no longer concerns just the classical outsourcing of logistics services. The range now extends from third-party production through to third-party research and development. Logistics service providers play a central role in this network of subprocesses. They are the “glue” that holds the network together and connects the individual points to a network.

Business process networks

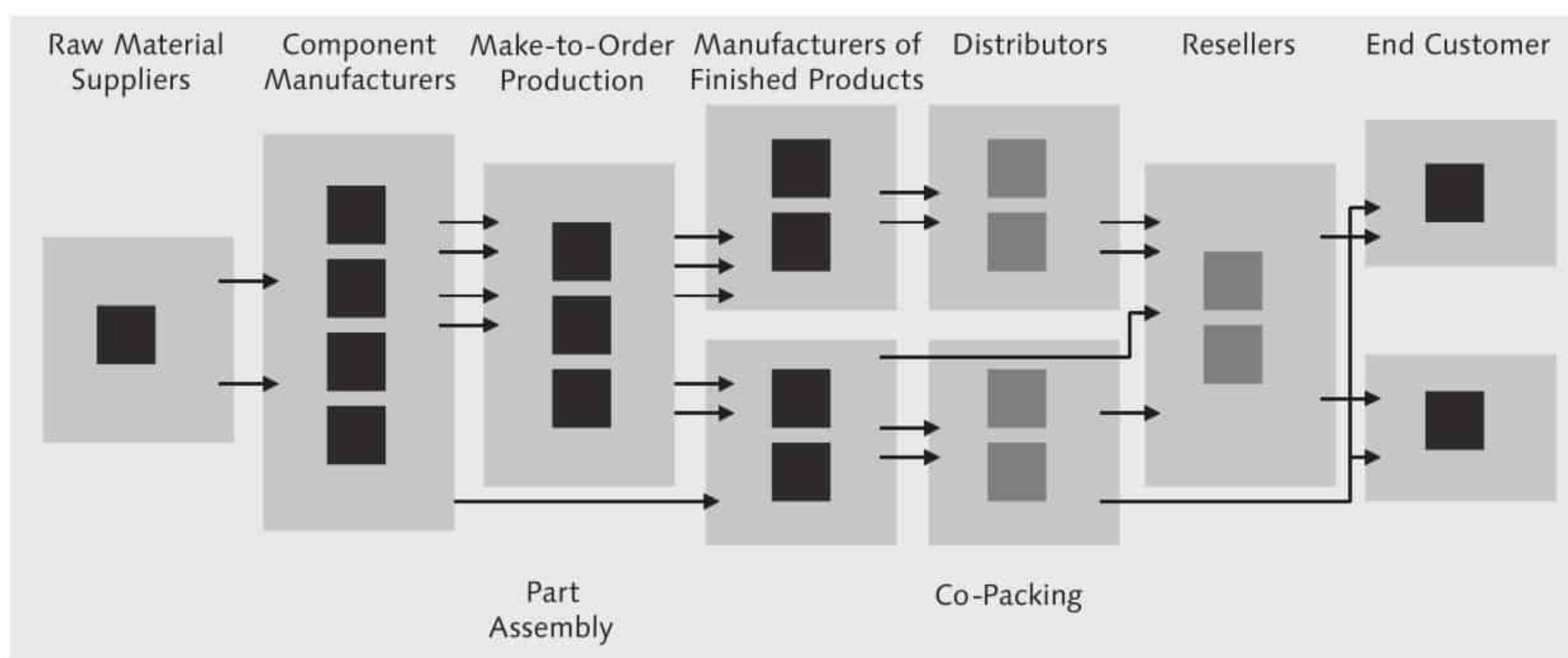


Figure 1.1 Business Process Networks

1.1 Logistics Service Providers

The term *logistics service provider* covers both third party logistics providers (3PL) and carriers. The main business of both is transportation processing, which is the core process of the enterprise and value chain. 3PL organize and arrange the transportation of goods, whereas carriers physically transport goods. Both types of logistics service provider work very closely together. 3PL who are unable to act as carriers (because they do not have their own fleet) rely on actual carriers.

1.1.1 Third Party Logistics (3PL)

3PL enterprises operate as organizers of transportation or storage. Increasingly, 3PL also provide the following services: packaging, order

Third party logistics providers (3PL) business model

management, customs clearance, and other *value added services*. However, the main business of freight forwarders is to organize the stream of goods between their customers and the customers of their customers (also known as *consignees*). In their pure form (known as *traditional freight forwarders*), they deploy the services of other companies to render transportation services. Many 3PL have their own fleet and operate on certain routes or for certain customers or segments. At the same time, they organize and render transportation services. Such enterprises are known as *forwarders acting as carriers*.

The business model for the 3PL aims to derive a profit by expertly purchasing transportation services, selling these services, and commanding a fee for organizing the shipment. A profit or loss equates to the difference between the cost of goods purchased and sold. Another way of generating a profit in air cargo is to add an *agent surcharge* for organizing the shipment, which is shown on an airline's invoice to its customer.

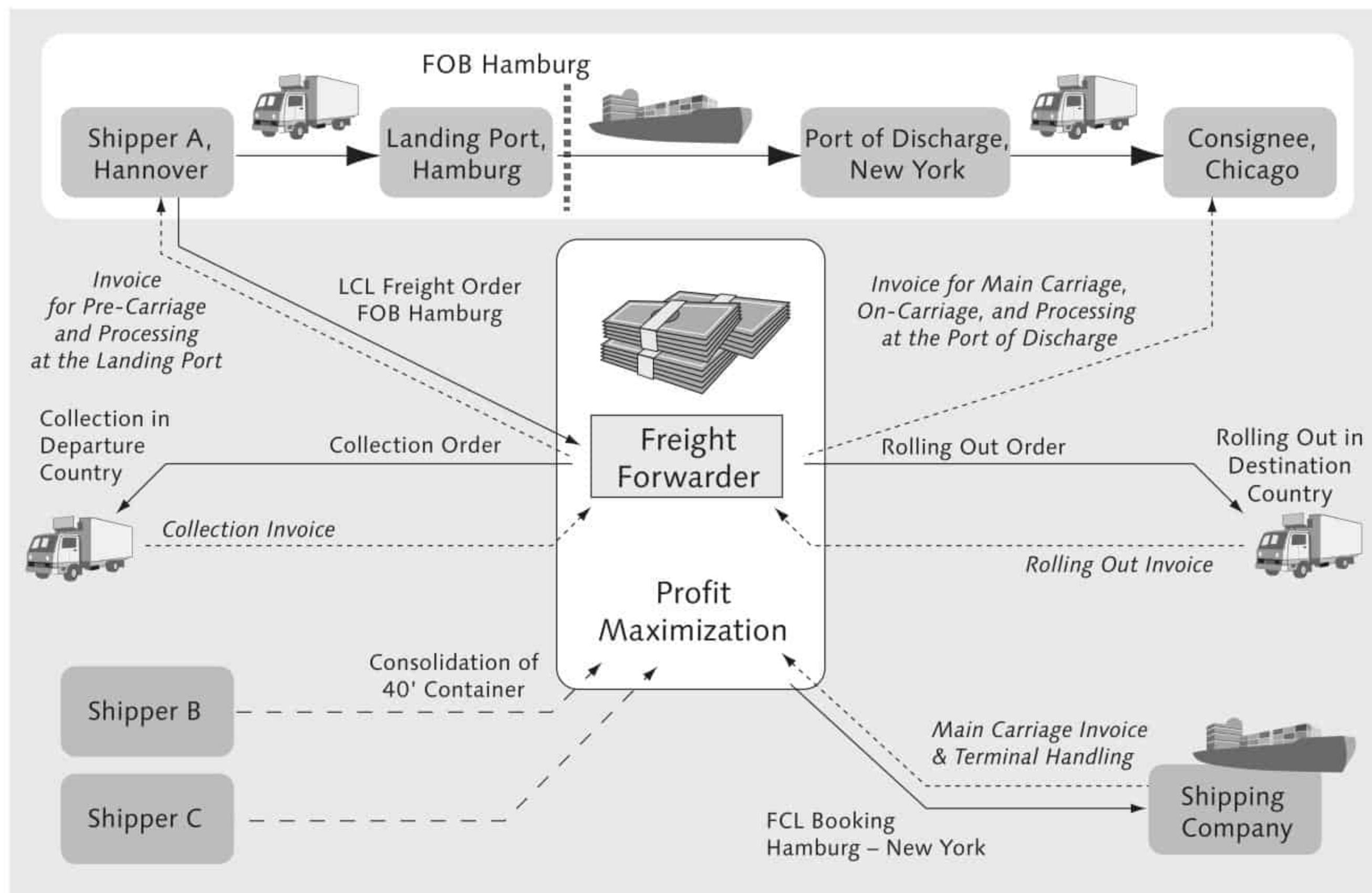


Figure 1.2 Profitability Calculation for a 3PL (Simplified Illustration)

The 3PL can also optimize costs by combining loads, in other words, by transporting shipments from several consignors together, but calculating and settling each shipment as a single shipment, thus increasing profit. If 3PL act as carriers, they must be aware of the costs associated with providing the service themselves, so that they can derive a profit for their enterprises. A detailed profitability calculation is the basis for every 3PL and carrier (see Figure 1.2).

Profitability
calculation

For direct shipments, it is easy to establish this transparency and calculate the profitability. The process becomes much more complicated if various subsidiaries or enterprises and, if necessary, various modes of transport are involved in the overall transportation process.

If transportation takes place within an enterprise network, the organizations involved allocate the internal cost rates among each other to assess the cost efficiency of the subsidiary. *Internal activity allocation* (IAA; see Figure 1.3) plays a major role in 3PL enterprises and has specific software requirements. You'll learn more about these requirements in Chapter 9, Calculating Transportation Charges.

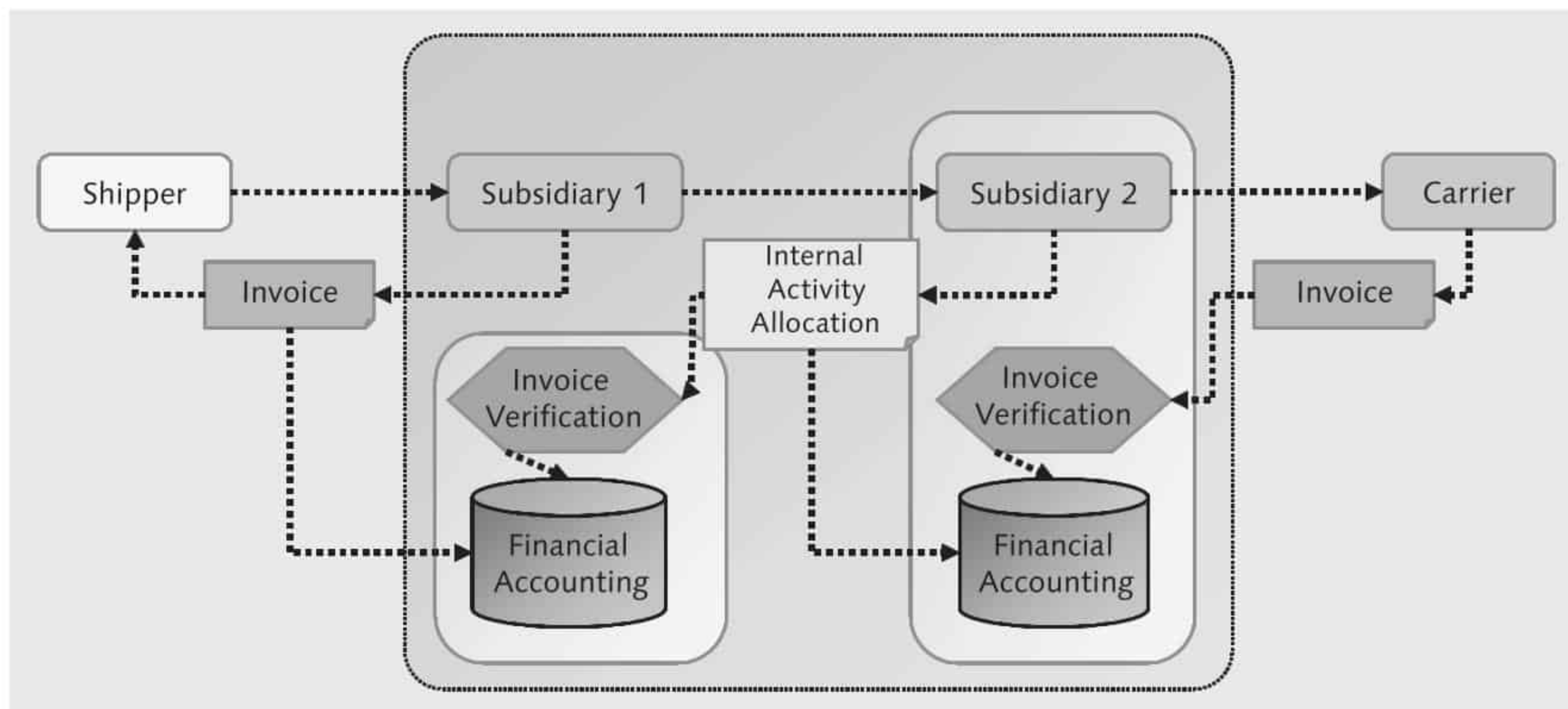


Figure 1.3 Internal Activity Allocation (Simplified Illustration)

The business relationship between those involved in transportation looks like the following:

Contractual relationship between the consignor and consignee

A *sales order* documents the sale of goods transaction between the consignor and consignee. It generally also contains attributes that regulate the transportation of goods. These attributes are usually the *incoterms* between the parties to the contract. These terms regulate the transfer of risk and the allocation of the goods to be conveyed. The incoterms are issued by the International Chamber of Commerce (ICC), the details of which are published on their website (<http://www.iccwbo.org/incoterms/id3045/index.html>). For more information, see also Section 1.4.2 The Operational Contract between the Ordering Party and the Contractor.

In SAP systems, the sales order is represented by the *sales order* on the consignee side and the *purchase order* on the consignor side. Depending on how the incoterms are structured, the consignor or the consignee commissions the transportation of goods or, if necessary, both. The resulting contract is referred to as a *3PL order* and contains the contractual regulations associated with organizing transportation. The 3PL order was first introduced to SAP systems in SAP Transportation Management 6.0 and is mapped by the freight order object.

1.1.2 Carriers

Carrier business model

In comparison to 3LLs, carriers render the actual transportation service. Depending on the mode of transport, freight forwarders are also known as *carriers*. In air and sea cargo, carriers are generally multinational corporate groups such as large shipping companies or air cargo subsidiaries of airlines. The overland transportation market is shaped by medium-sized and micro enterprises that operate small fleets.

All enterprises operating as carriers have one thing in common: They try to generate a profit by making optimal use of the operating resources they deploy. The high fixed costs associated with operating resources such as trucks, ships, or aircraft and the variable costs that arise as a result of deploying these resources must be minimized by making optimal use of such resources.

The margins in this business model are achieved by expertly selling transportation services to the transportation market in accordance with supply and demand. Therefore, a high degree of transparency in relation to the operating costs and all additional costs (known as *full costs*) is the

With SAP Transportation Management 6.0, SAP offers new software to support complex transportation networks.

2 Overview of SAP TM 6.0

Transportation currently constitutes a core process in virtually all enterprises. Standardization and integration with related processes are key factors when it comes to creating transparency and efficiency in this area. Robust and scalable systems are essential, as was the case with enterprise resource planning (ERP) systems in the 1990s.

2.1 History of Transportation Management Software at SAP

SAP began developing business software for transportation processes in its early years. As far back as the days of R/2, SAP offered a dedicated component for dispatching sales orders. Transportation Management was one of the components belonging to the Logistics and Distribution area, and was viewed from the perspective of local distribution. The business processes in ERP systems initially revolved around production and the optimization of logistics processes directly related to production, such as production supply or product disposal. Against this backdrop, it is clear why transportation in R/2 and later components has always been based on deliveries or sales orders. The material and the sales process play the major roles, whereas logistics serves as a means to an end.

The SAP Transportation Management application originated in the logistics application in R/3 as part of the *SAP Logistics Execution System* component (LES). It allowed users to plan and dispatch deliveries and create shipments consisting of several deliveries. Extensive functions for calculating transportation charges and vendor settlement were also included. The transportation application dovetailed with the processes in the Sales and Distribution area and with settlement in Financial Accounting and

SAP LES

Purchasing. The main target group in R/3 was the shippers who use an ERP system to control their production and sales and distribution processes, and use the transportation application to map local distribution and distribution between plants.

Transportation planning in R/3 consisted of manual or rule-based planning, where deliveries with certain attributes, such as postal code or shipping point, could be grouped together automatically using planning profiles. In addition, the transportation application enables the control of document printing and of dangerous goods checks and the checking of mixed loading prohibitions, provided that the dangerous goods interface is connected to the SAP Environment, Health, and Safety component (EH&S). Following from the transportation process, it is possible to initiate transportation charges as well as settlement and transfer to Financial Accounting and Controlling.

Transportation charge

Transportation charges calculate the costs you can expect to be incurred for freight-handling services. The system uses the condition technique for this purpose, which many readers will be familiar with from traditional SAP Sales and Distribution components. Pricing procedures and access sequences are used to calculate prices and conditions from the logistics documents based on certain transportation-relevant parameters. In this way, the transportation charge document can calculate prices for the carrier and for other partners involved in the shipment.

Close integration with Purchasing

Transportation charges provide support to SAP ERP users for allocating cost items to the relevant cost centers or orders. The transportation charge component is closely integrated with the traditional functions from Purchasing in this regard, specifically, the External Service Management functions in Purchasing. We'll therefore examine this a little more closely now.

After the costs are calculated in the transportation charge document, the system determines the cost centers or order items that are to serve as cost collectors for the transportation order. Within this configuration, cost centers can be determined using various parameters.

The next step involves the integration of External Service Management. The transportation charge documents contain partners belonging to the Vendors account group, which can be processed in Purchasing. This account

group includes carriers, customs brokers, and other service providers that can be configured. A transportation charge document contains functions that run checks in the background to determine whether a purchase order already exists for a service provider and creates one if not. The acceptance of services performed within the purchase order is documented with a service entry sheet. This service entry sheet is similar to a goods receipt document in material procurement; it documents the acceptance and provides a starting point for further processing in Financial Accounting.

The transportation charge document can have three different statuses during processing, namely, *calculated*, *settled*, and *transferred*. *Calculated* describes the status when the costs have been calculated, but cost center determination has not yet taken place. *Settled* indicates that both the cost centers and the purchase orders have been determined or created. In the third and final step, the document is *transferred*, which means the costs have been posted to relevant accounts in Financial Accounting, and the purchase order and the service entry sheet have been created in Purchasing. This process is mapped in the system by the creation of documents in Purchasing (for example, purchase orders and service entry sheets) and in Financial Accounting (for example, with an FI document).

Once this step is completed, the expected costs are known in Purchasing, and invoice verification can now be performed or a credit memo created. With invoice verification, incoming invoices from service providers are checked against the costs calculated in the transportation charge document. This check may be performed at the item level or as part of a collective calculation at the totals level. Users can find invoice items from a shipment reference, the service provider name, and so on. In Financial Accounting, accruals are created during the invoice verification process to map the payables due to service providers. These accruals also serve the purpose of creating a time-based delimitation between the service performance and invoice creation.

In the credit memo process, a credit memo document is created for the service provider, and, in this way, the invoice verification process is "outsourced" to the provider. The provider is therefore assigned the responsibility of checking that the amount on the credit memo document is correct. No accruals are generated in Financial Accounting in the SAP

Credit memo

ERP system of the enterprise to which the service is provided, and the payment to the service provider is triggered directly.

2.1.1 Transportation Planning with the Transportation Planning and Vehicle Scheduling (TP/VS) Component

When planning and optimization systems began to gain importance in 2000, SAP provided the first planning software for complex transportation planning with *SAP Advanced Planning and Optimization (APO) 3.0*. Compared with the R/3 Transport component, *Transportation Planning and Vehicle Scheduling (TP/VS)* uses more complex optimization heuristics to optimize the allocation of orders to available transportation resources, while at the same time ensuring that delivery deadlines are met. In contrast to R/3, planning in TP/VS starts in the sales order. This has many benefits compared to planning that starts with the delivery. Deliveries are not created as part of the process until it is time for the goods to be picked so that the order is kept open and can be changed for as long as possible. From a transportation perspective, however, transportation planning and dispatching should start as soon as possible so that transportation capacities can be reserved and their utilization optimized.

TP/VS runs on the Supply Chain Management (SCM) component as part of SAP APO, and is connected to the SAP ERP system by means of an online interface. TP/VS is capable of planning not only with orders but also with deliveries, delivery changes, and so on as the transportation requirement. After planning, the completion of shipments is communicated back to the SAP ERP system so that document printing and settlement can be processed.

2.1.2 Additional Components

Industry-specific
functions

Transportation management plays a role in many industries, and the SAP ERP-based transportation solution was enhanced with some industry-specific functions as part of SAP's focus on industries. Three industries for which significant enhancements have been added are particularly worthy of mention here.

The beverage Industry within SAP Wholesale and Trade

The beverage industry has certain unique transportation requirements. The following enhancements were therefore made to the R/3 transportation component:

- ▶ Mapping of standard routes for the realization of daily routes that are consistently identical
- ▶ Connection to mobile end devices to allow drivers to map settlement processes (for example, when selling beverages)
- ▶ Connection of a partner solution for storage space planning

Oil and Gas Industry

In the oil and gas industry, the transportation of goods, the ownership structures, and the specific composition of the goods to be transported all play key roles. Oil and gas both have a wide range of specific weights at fluctuating temperatures, which is of particular relevance for settlement. For this reason, *Oil and Gas Transport Management* was integrated into the *Hydrocarbon Management solution*. The sale of these goods during their transportation represents another challenge in this industry, and this process influences transportation routing.

Railcar Management

In recent years, SAP Custom Development, SAP's customer development organization, has developed an enhancement for the management of railcars. This enhancement is based on SAP Logistics Execution System (LES) and SAP Supply Chain Event Management (SCEM), and is primarily aimed at the chemicals industry.

Railcar Management offers the following functions, which go above and beyond the scope of the standard SAP components: Functions

- ▶ Railcar planning
- ▶ Railcar tracking
- ▶ Tracking and billing of costs due to delays (detention and demurrage)
- ▶ Interface with SAP Plant Maintenance (PM)

- ▶ Railcar location status
- ▶ Transportation charge enhancement for simulation and settlement of costs with customers and using company codes

2.2 Initiative for the Development of the New SAP Transportation Management Solution

Several thousand SAP customers have implemented SAP Transportation Management, which is used extensively to control and monitor transportation processes. Why, then, did SAP decide to develop an enhanced Transportation Management solution in SAP SCM?

The answer to this question has to do with the fact that the relevant business processes are constantly changing. Chapter 1 provided a short introduction to the topic of business process networks, in which transportation plays a key role. From a shipper's perspective, transportation that serves the purpose of production supply or local distribution currently consists of a network of suppliers, carriers, and other transportation partners, and has become much more complex over the past decade. In times of ever-decreasing vertical integration and increasing outsourcing due to rising logistical costs, transportation is continuously gaining in importance. SAP acknowledges this trend and seeks to offer solutions both to existing customers and to the constantly growing market of logistics service providers. It was for this reason that SAP decided to restructure and revitalize its Transportation Management solution. It was decided that the ERP architectural model would retain its validity for local distribution and processes, but that the architecture and software functions needed to be modified to be able to map business process networks. The result of this development is SAP TM 6.0, the first version of SAP's new transportation management software.

SAP TM 6.0 was designed to map complex transportation networks. It supports the entire business process, from requests for quotation to the order, planning, and dispatching and, ultimately, billing and settlement of transportation services. The solution is also equipped with optimization algorithms for transportation optimization and route determination. The solution forms part of SAP Supply Chain Management, and is

embedded in SAP ERP. It uses both SAP ERP and the SAP Supply Chain Event Management component.

Another new feature compared with the SAP ERP Transportation solution is the focus on transportation as a service process, rather than as a subprocess of production or ordering. The system treats transportation as an independent process, which starts with its own quotation process and ends with settlement and billing. A number of radical changes to the SAP ERP Transportation solution have been incorporated into SAP TM 6.0. These include the following:

- ▶ Functionality with and without material master records
- ▶ Functionality with and without customer master data — support for one-time customers
- ▶ Quotation and order management for transportation services
- ▶ Enhanced planning and dispatching functions for complex networks
- ▶ Partial processing of transportation chains
- ▶ No distinction between inbound and outbound shipments, which enables the planning of round trips
- ▶ Complex transportation charges for both customers and vendors
- ▶ Calculation of profitability

These examples represent the key differences between transportation management in SAP ERP and SAP SCM. SAP Transportation Management 6.0 targets both existing markets (in particular, the shipper market with SAP ERP) and the new market of logistics service providers.

The system is also the successor to the two different solutions described above. SAP's many years of experience in the transportation and shipping segment are reflected in the fact that the new solution is ideally suited to a wide range of scenarios in the industries that have traditionally been the mainstay of the shipper area. It was developed with goods receipt and issue in mind, but, at the same time, is also explicitly aimed at logistics service providers.

All of the processes and functions for ship-from parties in industry are also of relevance to logistics service providers when the system is used in a typical outsourcing scenario. The harmonization of processes between

Focus on
transportation as a
service process

Shipper area

logistics service providers and the shippers in industry is very much in evidence today.

2.3 Components of the New SAP Transportation Solution

SAP TM 6.0 is composed of the components described in this section.

2.3.1 Master Data

Like ERP systems, SAP TM uses a minimum of master data. This data represents the network and the customer and partner relationships, as well as the materials handled. What is unique about SAP TM 6.0 is that it does not necessarily require any material master data to create or process orders. The same applies to partner and customer master records. As a result, the system can be used from the very start in the shipping environment, where only a small amount of information is available when orders are created, and where data needs to be changed during the entire process.

An important point to note in relation to the customer and partner master data (which is stored in SAP Transportation Management in the form of locations) is that this data may consist of either independent entities in SAP Transportation Management or copies of the master data from the SAP ERP system, which are enhanced with transportation-relevant attributes, such as longitude and latitude. As is so often the case in standard software, this decision is left to the customer. The system supports both processes, which allows customers to implement processes in accordance with their specific business processes.

Tariffs and rates The master data in SAP Transportation Management also includes tariffs and rates. These can be maintained within Tariff Management or uploaded. The tariff structures are defined in the system configuration.

2.3.2 Order Management

Order Management in SAP TM 6.0 supports the order entry process for a transportation service. The orders can be entered manually or elec-

tronically. An order typically contains customer and partner data and the date, time, and details of the cargo.

Orders can be created using a special fast-entry input screen, which displays a minimum of details for the shipment. The user can, however, switch to a detailed screen at any stage. This shows all details relating to the shipment, and is therefore suitable for use by expert users. Orders can also be entered using a template. In the case of repeat orders or orders that have similar shipment attributes, copying a template may minimize the time spent on data entry and increase productivity. Order Management also supports print functions and offers a route proposal function, which helps users plan and dispatch a shipment using a complex network.

2.3.3 Planning and Optimization

The planning function consolidates shipments into loads, taking account of predefined general conditions, for example, in relation to volumes, the desired arrival time, compatibility of the means of transport and the goods to be transported, and so on. Planning is executed either online or in the background, and helps transportation dispatchers carry out routine tasks. Optimized planning results require the maintenance of a planning profile and the planning-relevant master data. The planning profile specifies which combination of parameters defined in the configuration is to be used when planning shipments. The master data, meanwhile, is essential if the planning algorithms are to function correctly. Planning-relevant master data includes locations, resources (which represent the various means of transport), and tariffs (which determine the cost of using a specific combination of planning parameters).

In addition to transportation optimization itself, which produces an optimized transportation plan, planning also incorporates a transportation service provider selection function. In this step, the system helps the dispatcher find the best transportation service provider to transport the goods at the lowest costs. The system simulates the transportation charges for the various carriers available, and selects the most reasonably priced carrier based on the tariffs maintained in the master data. In addition, the dispatcher has the option of manual planning without automatic transportation planning.

Transportation
service provider
selection

The accurate automated calculation of transportation charges is a prerequisite for one of the most important business purposes of transportation management software, namely, invoicing customers and suppliers.

9 Calculating Transportation Charges

Even at the order receipt stage (quotation, shipment request, or freight request), an enterprise should be able to calculate expected revenue so that it can, for example, propose a price to a customer or decide to reject an order because of the anticipated low profit. During planning, the calculation of transportation charges can be used to select the most favorable transportation service provider and, during subcontracting, the enterprise should always keep an eye on expected costs. Furthermore, the calculation of transportation charges is the basis for invoicing customers and suppliers. Consequently, this aspect is a significant part of all core processes within SAP Transportation Management (TM).

The calculation of transportation charges should be fully automated, wherever enterprise and partner pricing permits. From a monetary perspective, transportation processing is most efficient if, from the first quotation or shipment request until receipt of payment from the customer and from the moment that subcontracting commences until payment of the supplier invoice, the user does not have to intervene at all, and can always rely on accurate, complete, and automated calculations.

As you'll see, transportation charge management within SAP TM is a powerful and very flexible tool that was designed, from the outset, to fulfill this need for efficiency. Furthermore, it is also possible to combine automatically determined costs with manual entries in each business transaction, or to completely overwrite automatically proposed calculations in documents (for example, following individual negotiations with customers or suppliers for a particular order).

Business
background



Intra-enterprise
allocation

SAP TM 7.0 has extended the opportunities for the inter and intra company calculation and invoicing of transportation services under the heading *Internal Transportation Charge Calculation*. For this purpose, we can assume that the tools that currently exist for both customer and supplier freight calculation and invoicing have been reused because ultimately, customer and supplier relationships can be abstracted into those relationships within a transportation service company and between partners.

In this chapter, we'll first explain how the calculation of transportation charges has been integrated into the various SAP TM processes. We'll then discuss all configuration and master data for this component, namely, the *freight agreement, tariff, calculation sheet, rate, and scale* business objects. Despite being a complex method for mapping almost all of the requirements for modern and flexible pricing in transportation, it satisfies numerous real-life requirements.

9.1 Calculating Transportation Charges within Subprocesses

Comment on
terminology

The terms *Kostenmanagement (charge management)* and *Transportkostenberechnung (transportation charge calculation)* in the German version of SAP TM may cause some confusion if, in this context, the reader takes the term *Kosten/charges* too literally. From a business perspective, the system is structured in such a way that revenue is paramount in order management, whereas subcontracting concerns only costs. When considering profitability from an order perspective, revenue and costs are set against each other. In the English version of SAP TM, *transportation charge management (TCM)* was chosen as a neutral umbrella term.

From a technical perspective, customer freight calculation and supplier freight calculation mirror each other to a large extent. In other words, each configuration and the inner logic of the program flow use very few parameters to decide whether transportation charging is to determine a "sales price" (on the order side) or a "purchasing price" (on the subcontracting side).

9.1.1 Order Receipt

As already mentioned in Chapter 6, Order Management, the quotation document and shipment request only differ marginally from a technical and object model perspective. Therefore, we'll mainly use the shipment request when considering the main calculation components.

Essentially, we have to distinguish between five functions (see Figures 9.1 and 9.2):

- ▶ Calculate Transportation Charges
- ▶ Estimate Profitability
- ▶ Calculate Profitability
- ▶ Check Customer Limit
- ▶ Create Invoice Request

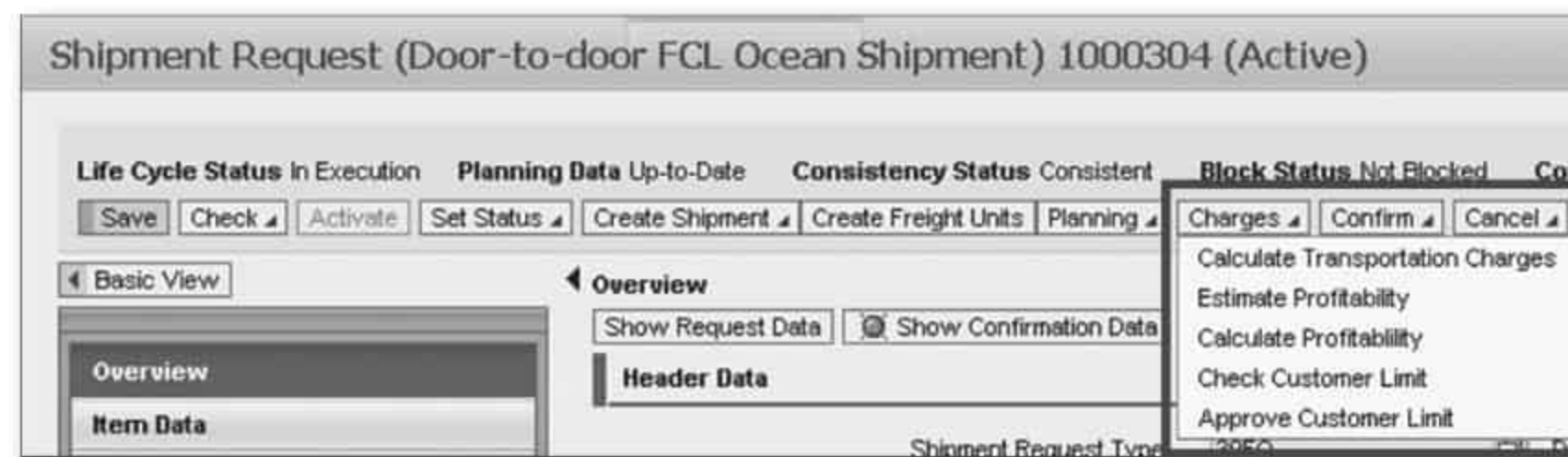


Figure 9.1 Calculation-Related Order Receipt Functions

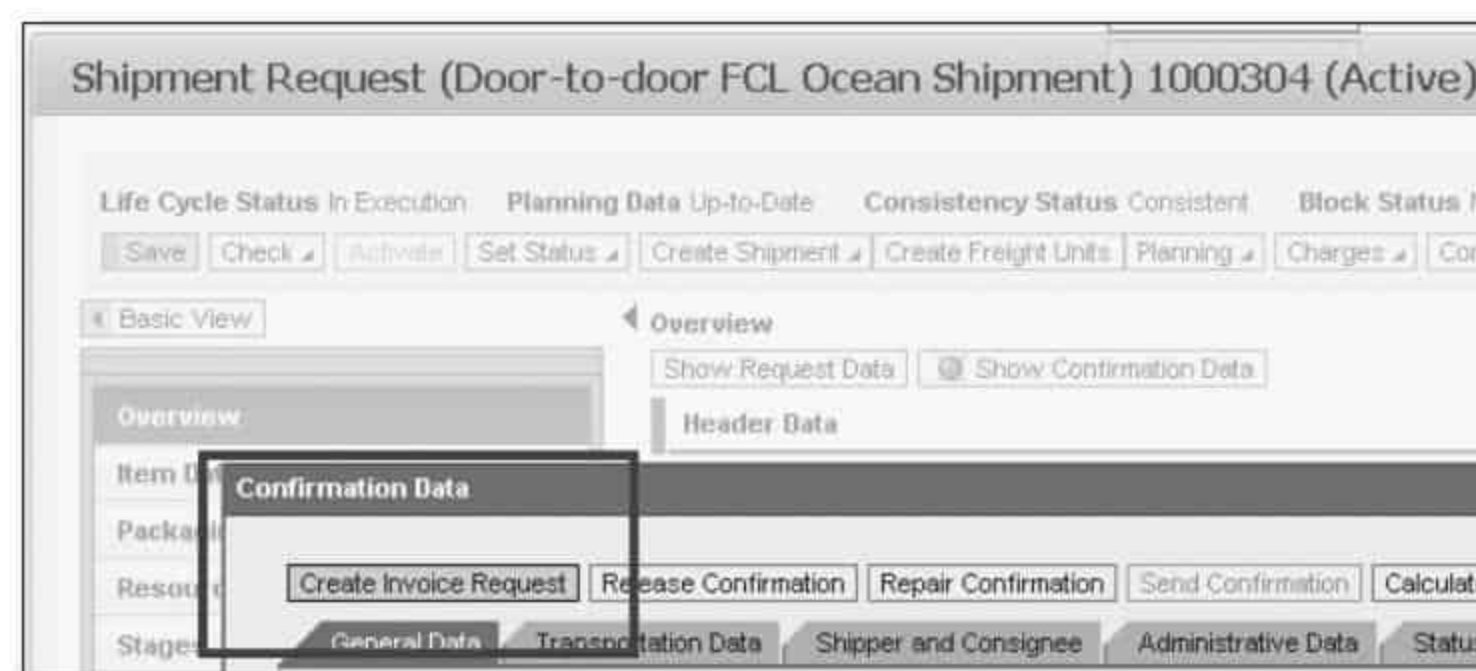


Figure 9.2 Create Invoice Request

All of the above functions share one thing in common, namely, that the existing master and configuration data are used to commence automatic calculation of the revenue. In Section 9.2, All Master Data for the Calculation of Transportation Charges, we'll take a close look at how to access each individual master data object (for example, freight agreement, tariff,

and so on). First, let's take a look at how to interpret and use the results provided by the various functions.

Calculating Transportation Charges

Log If you have not changed the general display settings (see the Shipment Request user interface menu path DISPLAY SETTINGS • GENERAL SETTINGS • NUMBER OF MESSAGES), you'll first be confronted with a very detailed log (see Figure 9.3).

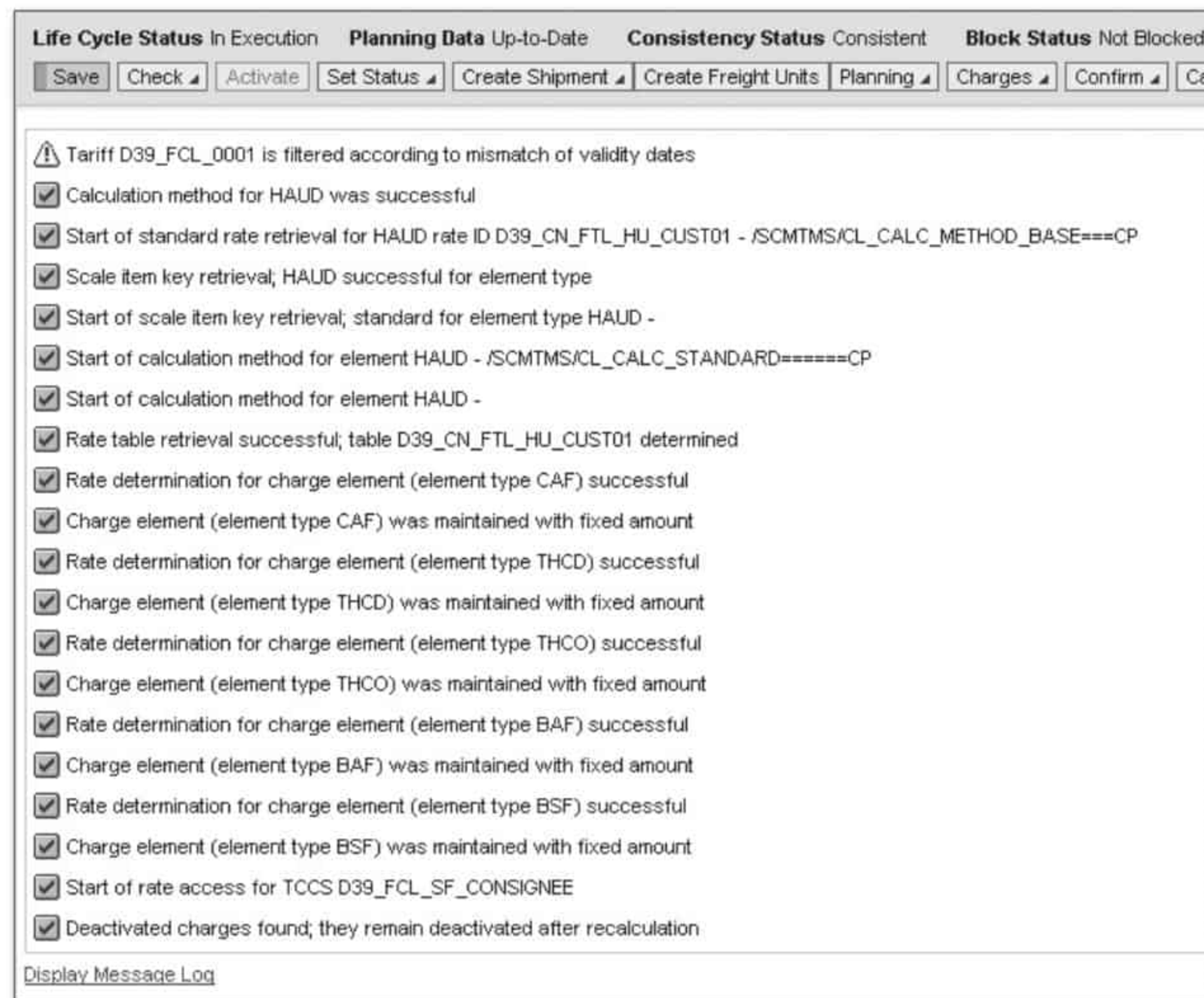


Figure 9.3 Sample Detailed Calculation Log Following Successful Execution

Frequently, this detailed information does not play any significant role in a normal business transaction. However, if the system issues warnings or error messages, or if the calculation result does not seem plausible, you should take a closer look at this information to determine the source of the error.

For this purpose, the system writes all important events during a calculation. These events are primarily divided into the following (see also Section 9.2.1, Overview and Interaction of Objects):

- ▶ Determining the relevant partner (bill-to party)
- ▶ Determining the master data for the freight agreement, tariff, and calculation sheet
- ▶ Applying the master data to the document (exploding the calculation sheet and preparing the charge elements)
- ▶ Determining various calculation base data within the document (weight, volume, distances, and so on)
- ▶ Applying the calculation base data to the rate tables found
- ▶ Adding up the charge elements and checking them against any manual or fixed charge elements that already exist

Tip

As soon as the system settings are correct and the system is in an “established state,” you’ll only require the purely informational messages contained in the calculation log in exceptional cases. You can therefore use the user parameter /SCMTMS/TC_TRACE (SAP GUI menu: SYSTEM • USER PROFILE • OWN DATA • PARAMETERS) to specify that the information messages are no longer logged and only warnings and error messages are displayed.

In our example in Figure 9.3, the system settings are correct and the document contains all of the necessary information, which means you can take a closer look at the result on the Charges and Method of Payment screen view (see Figure 9.4). The information displayed here is interpreted as the revenue, and the customer is invoiced this amount for the shipment request.

Res. Instr. Type	Total	Curr.	TCE Type	Rate	Curr.	Amount	Curr.	Fixation	Description	Business Transaction Document ID
Sum	60,192	JPY		0.000000		0.000000		<input type="checkbox"/>		
Sum	619.45	USD		619.45	USD	619.45	USD	<input type="checkbox"/>	Sum Main- and On-Carriage	D39_CUCO1
Sum	3,500	JPY		3,500	JPY	3,500	JPY	<input type="checkbox"/>	Sum Pre-Carriage	D39_CUSH1

Figure 9.4 Calculation Result – Two Bill-To Parties in Accordance with the Free on Board Incoterm

Note the processing statuses of the shipment request

However, we must immediately qualify this statement because, on the one hand, only the values of the customer freight invoice request business object, which are based on the shipment request, are ultimately relevant for the actual invoice and, on the other hand, you must also note the various different processing statuses of the shipment request. Consequently, the calculation results between the request data, work area data, and confirmation data in a shipment request can and must differ greatly. However, the customer freight invoice request and therefore the actual customer invoice are ultimately derived only from the calculation result for the confirmation data.

The example shown in Figure 9.4 contains a special feature because, on the one hand, this shipment request generates revenue of approximately 60,000 Yen. On the other hand, however, this amount consists of two partial amounts, namely, \$620 and 3,500 Yen. The two partial amounts are charged to different bill-to parties because the shipment request was created with the standard incoterm *Free on Board* (FOB). As is well known, the transportation charges for these special international terms of trade must be allocated between the shipper and the consignee (see Chapter 1, Introduction to Transportation Logistics).

Incoterms in SAP TM

When allocating transportation charges, SAP TM automatically takes account of the standards for the international terms of trade in accordance with *Incoterms 2000 (6th revision)*. However, for the automated process, it is important that the corresponding freight agreements and tariffs are maintained for all bill-to parties involved.

In the case of a shipment from Walldorf via Rotterdam to Chicago, a search is performed to find a freight agreement between the enterprise and a shipper, which contains at least one valid tariff from Walldorf to Rotterdam. At the same time, the system requires a freight agreement between the enterprise and the consignee, which ultimately results in the price for the stage from Rotterdam to Chicago (for information about freight agreements and tariffs, see Sections 9.2.2 and 9.2.3).

Note

If you want to use terms of trade other than the Incoterms 2000 Standard in the system, the business add-in (BAdI) /SCMTMS/CFI_INCOTERM_SPLIT must be programmed to determine the bill-to parties and to allocate the shipment request portions to be calculated, if necessary. For this purpose, the programmer can be guided by the existing source code for handling standard incoterms, which is directly available in the calling point environment of the aforementioned BAdI (class /SCMTMS/CL_CFI_PROC with the method INCOTERM_SPLIT_AND_PARTIES).

Frequently, the terms of trade are also used as the basis for making decisions within the calculation sheet (for example, "only take account of the charge element if the shipment request was created in accordance with the terms of trade XYZ") or as an influencing factor for various other condition-driven components within the transportation component (for example, "find different rate tables, depending on the incoterm").

We have made this brief reference to incoterms to explain why all of the details concerning calculated transportation charges are displayed on the Charges and Method of Payment screen view, but *cannot be edited*. Instead, the actual editable transportation charges are always assigned to a business partner (see Figure 9.5).

Calculation results always assigned to a partner

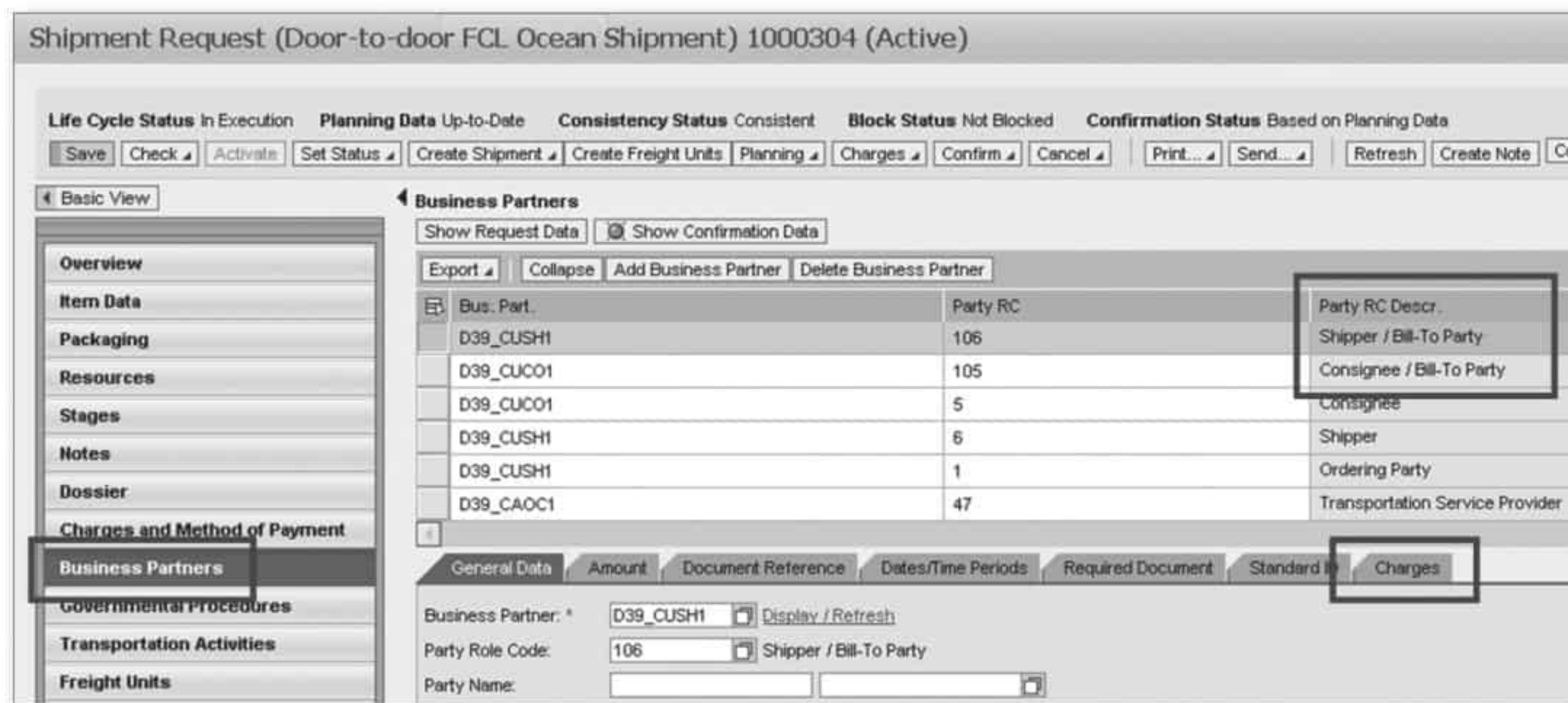


Figure 9.5 Assignment of Calculation Results to Business Partners Who Have the Role "Bill-To Party"

As you can see in Figures 9.5 to 9.7, a Charges tab is displayed when you select a business partner who has the role *Bill-To Party* (role ID 105, 106, or 10). This is not the case for all other roles.

Business Partners

Show Request Data Show Confirmation Data

Export Collapse Add Business Partner Delete Business Partner

Bus. Part.	Party RC	Party RC Descr.
D39_CUSH1	106	Shipper / Bill-To Party
D39_CUCO1	105	Consignee / Bill-To Party
D39_CUCO1	5	Consignee
D39_CUSH1	6	Shipper
D39_CUSH1	1	Ordering Party
D39_CAOC1	47	Transportation Service Provider

General Data Amount Document Reference Dates/Time Periods Required Document Standard ID **Charges**

Transportation Charge ID: 0000001329

All Charges Charge Header Details and Exchange Rates

Add New Charge Details Update

Res. Instr. Type	TCE Type	Total	Curr.	Fixation	Inactivity Code	Description	Business
Sum		3,500	JPY	<input type="checkbox"/>		Sum Pre-Carriage	
Sum		3,500	JPY	<input type="checkbox"/>		Subtotal	1000304
Evaluate Single Charge ...	HAUO	3,500	JPY	<input type="checkbox"/>		Haulage Origin (FCL)	1000304

Figure 9.6 Pre-Carriage Share Assigned to Bill-To Party D39_CUSH1 (Pickup Location to Port of Departure)

Business Partners

Show Request Data Show Confirmation Data

Export Collapse Add Business Partner Delete Business Partner

Bus. Part.	Party RC	Party RC Descr.
D39_CUSH1	106	Shipper / Bill-To Party
D39_CUCO1	105	Consignee / Bill-To Party
D39_CUCO1	5	Consignee
D39_CUSH1	6	Shipper
D39_CUSH1	1	Ordering Party
D39_CAOC1	47	Transportation Service Provider

General Data Amount Document Reference Dates/Time Periods Required Document Standard ID **Charges**

Transportation Charge ID: 0000001330

All Charges Charge Header Details and Exchange Rates

Add New Charge Details Update

Res. Instr. Type	TCE Type	Total	Curr.	Fixation	Inactivity Code	Description	Business Tran
Sum		619.45	USD	<input type="checkbox"/>		Sum Main- and On-Carriage	
Sum		575.74	USD	<input type="checkbox"/>		Subtotal Sea (Main-Carriage)	1000304
Evaluate Single Charge ...	BSF	327.80	USD	<input type="checkbox"/>		FCL Seafreight	1000304
Evaluate Single Charge ...	BSF	0.00	USD	<input type="checkbox"/>	X	FCL Seafreight (optional)	1000304
Evaluate Single Charge ...	BAF	65.56	USD	<input type="checkbox"/>		Bunke Adjustment	1000304
Evaluate Single Charge ...	THCO	109.27	USD	<input type="checkbox"/>		Terminal Handling Origin	1000304
Evaluate Single Charge ...	THCD	60.00	USD	<input type="checkbox"/>		Terminal Handling Destination	1000304
Evaluate Single Charge ...	CAF	13.11	USD	<input type="checkbox"/>		Currency Adjustment	1000304
Sum		43.71	USD	<input type="checkbox"/>		Subtotal On-Carriage	1000304
Evaluate Single Charge ...	HAUD	43.71	USD	<input type="checkbox"/>		FTL-Charge (Land)	1000304

Figure 9.7 Main-Carriage and On-Carriage Share Assigned to Bill-To Party D39_CUCO1 (Port of Departure to Delivery)

The system determines the two partners who have role 105 (Consignee/Bill-To Party) and 106 (Shipper/Bill-To Party). For shipments made without incoterms, you'll only find a bill-to party with role 106 after the automatic calculation. This is based on the business partner who has role 6 (Shipper).

The shipper and bill-to party are usually identical unless you use a basic function of business partner master data maintenance (Transaction BP), which allows you to maintain a different bill-to party for a partner. In this case, the system determines the associated bill-to party from the goods recipient (use Transaction SE24 to view the code section in the class / SCMTMS/CL_CFI_PROC with the method BILLTO_PARTY_DETERMINATION).

If an incoterm such as FOB has been applied, the goods recipient can also be invoiced. This explains the special need for the business transaction to be able to differentiate between role codes 105 and 106. It is possible to overwrite the bill-to parties proposed by the system. The customer freight invoice requests created toward the end of the process chain are then created for this new selection rather than the partners originally determined by the system.

It is also possible to add any additional bill-to party as a business partner. These must be created with role 10 (however, the business partner master data is not checked here for any other bill-to parties that may have been maintained). It is sufficient to enter the additional bill-to party with role 10. During the next recalculation, the system will try to determine a suitable freight agreement and tariff for this partner to provide an automatic calculation.

Of course, you can also manually specify the desired tariff and/or freight agreement for the additional bill-to party, which means that the standard determination is not required. In this case, you only have to consider the Fixation Code checkbox (see Figure 9.8).

You must also select this Fixation Code checkbox if you do not want a freight agreement–tariff combination once found by the system to be overwritten during a later recalculation. The automatic standard determination logic is triggered unless the checkbox is selected. The Fixation Code checkbox also plays a role if you change or add charge elements.

Additional bill-to party for each shipment request



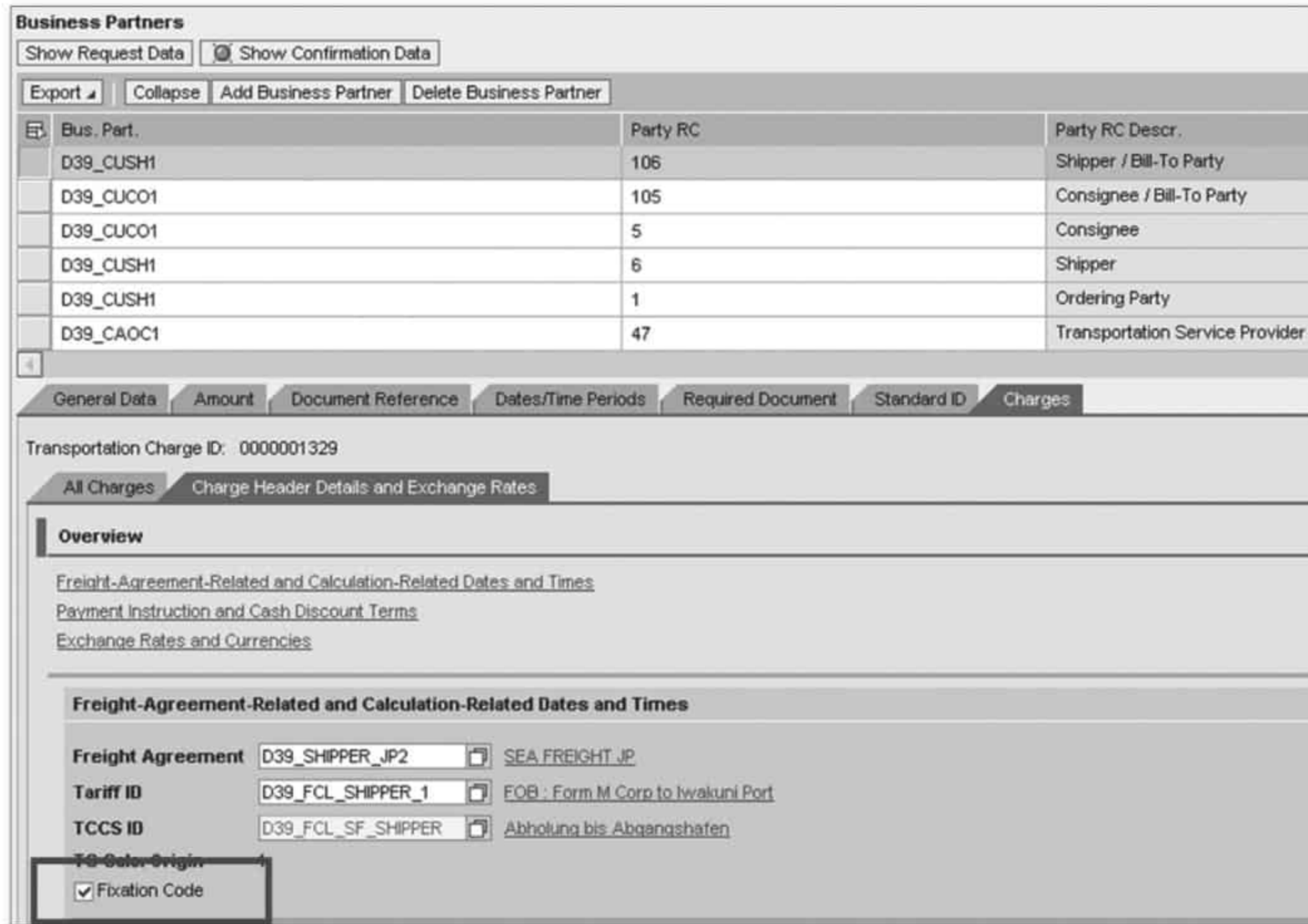


Figure 9.8 Specifying and Fixing a Freight Agreement and Tariff

Figure 9.9 gives you an idea of how the user interface looks after a user has manually specified an entry for transportation revenue.

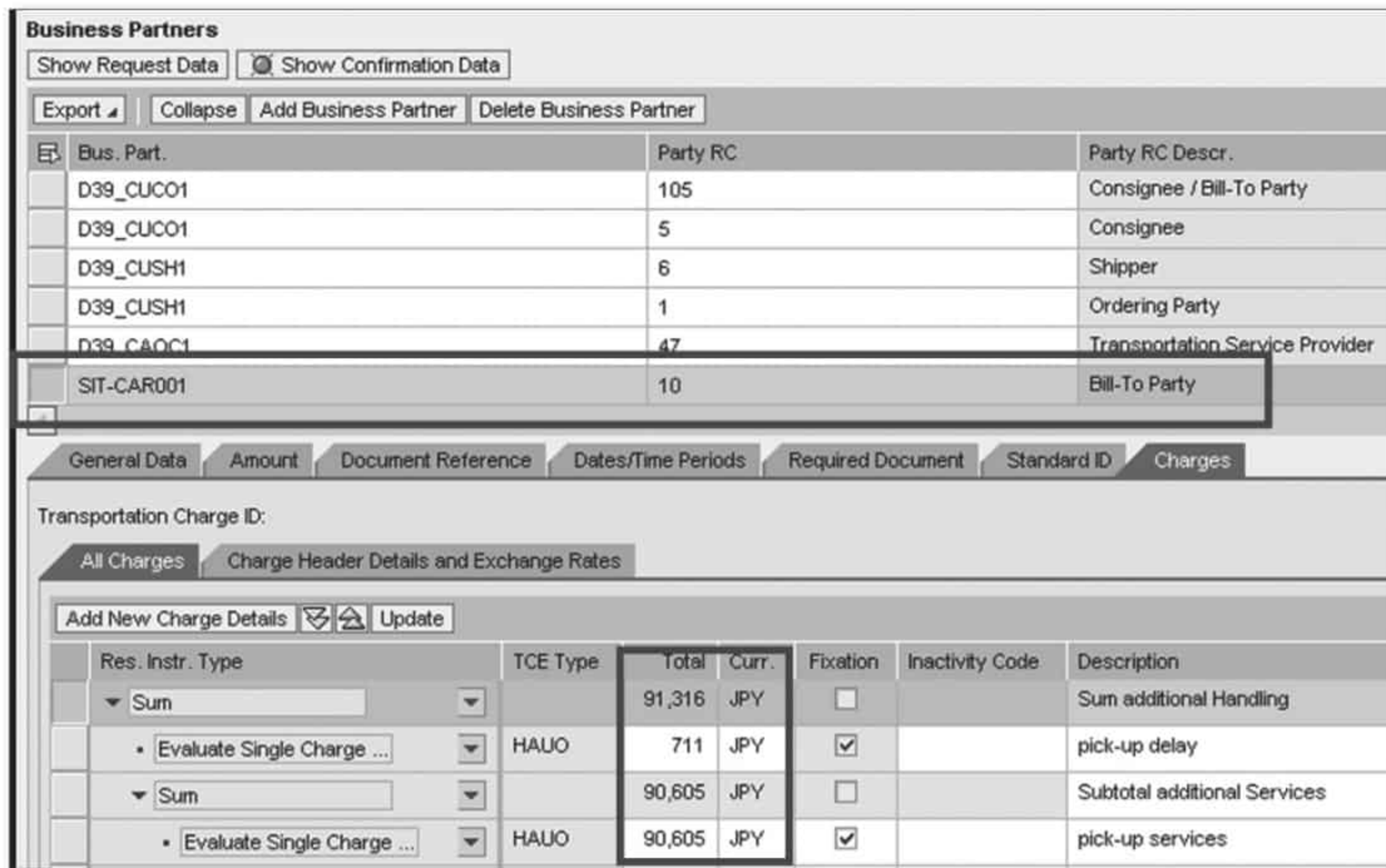


Figure 9.9 Manually Added Bill-To Party and Charge Element

Note: A Look at the Data Model for Calculation Results

Bearing in mind that transportation charges can be displayed in two places within the system (on the Charges and Method of Payment view and for each business partner who has the role Bill-To Party), the following is a brief note in relation to the data model view. As will be explained in detail in Chapter 15, Technological Principles, you can use Transaction /TMSF/CONF_UI (or /BOBF/CONF_UI as of SAP TM 7.0) to analyze the static object model.

All of the calculated transportation charges are always stored in a dependent object (DO) called /SCMTMS/TRANSPORTATIONCHARGES. We'll consider the individual nodes of this Charges DO in Section 9.2.6, Transportation Charge Calculation Sheet. The question as to how the data is arranged "behind the user interface" is of particular interest to us here.

The Charges DO, which contains the total revenue of all bill-to parties, is available via the following menu path: ROOT • TRANSPORTCHARGESINFO • TRANSPORTCHARGES (see Figure 9.10), and the revenue for each business partner is available via ROOT • PARTY • PARTYTRPCHARGEINFO • PARTYTRANSPCHARGES. Each business partner has a Party node (that is, an entry in the business partner table /SCMTMS/D_SRQPTY), but only partners who have role 105, 106, or 10 have a partytranspcharges node. It is especially useful to familiarize yourself with this object model if you want to enhance or modify the system.

If you select one of the bill-to parties and navigate to the Charges tab, you can analyze the values assigned to this business partner in detail. First, it is interesting to see which freight agreement, tariff, and calculation sheet the system automatically found. This information is stored under Charge Header Details and Exchange Rates on the Charges tab page, as shown in Figure 9.11.

As already mentioned, no problems are associated with overwriting the freight agreement and tariff proposed by the system. However, you must select the Fixation Code checkbox before selecting Calculate Transportation Charges again. The Fixation Code checkbox is the only way the system knows whether to retain the freight agreement or tariff entered, even if another tariff would have been found after the logistics data in the shipment request had changed (for example, if the tariff depends on the total weight, but this has changed since the last calculation).

Overwriting the system proposal for the freight agreement or tariff

Index

A

A2A services, 624
Acceptable dates, 199
Access sequence, 132
Accrual, 67
Accrual creation, 586
Action, 619
Action and status area, 92, 192
Action definition, 167
Active version, 99
Activity method, 530
Address, 110, 121
Ad hoc transportation, 43
Administrative data, 204
ADSp (German Freight Forwarder's Standard Terms and Conditions), 56
AETR, 51, 52
Agency business, 45, 568
Agent surcharge, 20
Aircraft, 213
Aircraft type, 251
Airway Bill (AWB), 49, 63
Airwaybill stock, 245
Allocation, 256, 280, 316, 331, 345
 Relevant, 280
Analysis, 499
APO (Advanced Planning & Optimization), 68
Application interface, 507, 509, 541
Application log, 515
Application object, 507, 511
 Message, 515
Application object type, 552
Article, 104
A.T.A carnet, 55
Attached equipment, 149
Attachment folder, 198
Authorization profile, 521
Authorization workflow, 232
Automatic tendering, 350
AWB number, 513

B

B2B services, 624
Background processing, 259
Batch, 32
BDI (Federation of German Industries), 56

BGA (Federation of German Wholesale and Foreign Trade), 56
Billing document, 484
Bill-to party, 109, 211, 236
B/L, 74
Black box, 30
Booking order, 317, 567
 Confirmation, 320, 568
 Data, 319
 EDI, 319
 Planning, 568
 Release, 319
BOPF (Business Object Processing Framework), 614
Broadcast tendering, 354
Bulk, 35
Bulkiness, 45
Bulk material processing, 35
Bulk product, 223
Business-area-specific and region-specific systems, 96
Business hours, 110
Business Warehouse, 496
Business object
 Semantics, 509
 Association, 186
 Context, 92
Business partner, 99, 109, 150, 187, 558
Business process network, 17, 19
 Transformation, 19
Business process objects, 614
Business process type, 510, 552
Business Rule Framework plus (BRF+), 159
Business share, 130, 280, 345
BW profile, 522

C

Calculating transportation charges, 218, 357
Calculation rule, 141
Calendar resource, 121, 146
Canvas area, 91
Capacity, 149, 278
 Decreasing, 156, 313
Capacity area, 292
Capacity bottleneck, 317
Capacity selection, 269

- Cargo aircraft only (CAO), 44
 - Carrier, 22, 109
 - Cartage note, 43
 - Chargeable weight, 45
 - Charter flight, 44
 - CIF, 113, 122
 - CMR, 58
 - Codes for Incoterms 2000, 57, 58
 - Collaboration, 555
 - Collaboration portal, 561, 583
 - Collection time window, 199
 - Collective load, 42, 47
 - Commercial register number, 110
 - Commoditization, 18, 37
 - Commodity goods, 35
 - Commodity service, 35
 - Communication, 235
 - Compartment, 144, 171, 301, 311, 314
 - Fixed*, 154
 - Flexible*, 154
 - Steps*, 154
 - Compartment profile, 154
 - Component services, 624
 - Condition, 158, 170, 266, 271
 - Condition type, 158
 - Configuration object, 614
 - Configuration template, 350
 - Configure manually, 350
 - Confirmation of events, 221
 - Consignee, 20, 109, 194, 203
 - Consignment note, 23
 - Consignor, 104
 - Consolidation, 242
 - Container, 145, 213, 565
 - As product*, 602
 - Line haul*, 602
 - Number*, 214, 513, 571
 - Port*, 564
 - Ship*, 565
 - Tracking*, 507
 - Type*, 602
 - Validation number*, 571
 - Context, 268
 - Context area, 296
 - Context determination, 268
 - Continuous move, 130, 282, 343, 345
 - Control channel, 507
 - Core Interface, 113
 - Cost determination, 279
 - Cost element, 212, 232
 - Fixing*, 232
 - Manual change*, 232
 - Cost function, 276
 - Cost interpretation, 280
 - Costs
 - Internal*, 130, 280
 - Costs and payment method, 188
 - Couple, 313
 - Coupling, 256
 - Coupling activity
 - Couple*, 144, 153
 - Uncoupling*, 144, 153
 - Create Customer Freight Invoice Request, 468
 - Create Invoice Request, 389
 - Create new customers, 110
 - Create Supplier Freight Invoice Request, 468
 - Credit limit check, 103
 - Credit memo, 67
 - Cross-company systems, 96
 - Currency, 372
 - Customer condition types, 161
 - Customer freight invoice request, 236
 - Processing*, 626
 - Customer freight invoice requests, 561
 - Customer information sheet, 251
 - Customer limit, 232
 - Check*, 232
 - Customer order number, 217
 - Customer-specific calculation rules, 596
 - Customer tariff number, 107
 - Customizing, 246
 - Customs identification number, 216
 - Cut-off time, 43
- D**
-
- Dangerous goods indication, 187
 - Dashboard, 496
 - Data access definition, 159
 - Data area, 93, 194
 - Data area selection, 194
 - Data detail area, 93, 194
 - Data extraction, 499
 - Data model, 616
 - Dates/times, 300
 - Date time-spans, 203
 - Deadheading, 23
 - Decision-making types, 159
 - Decision table, 159
 - Delivered at frontier, 587
 - Delivery number, 216
 - Delivery vehicles, 592

- Demurrage, 556, 610
 Departure calendar, 137, 141, 565
 Desired data, 179
 Destination, 194, 199
 Destination route, 43
 Detention, 556, 610
 Determination, 619
 Deviation check, 330
 DIHK (Association of German Chambers of Industry and Commerce), 56
 Dimensional weight, 589, 595
 Role code, 595
 Direct load, 47
 Direct shipment, 32
 Direct transportation, 40
 Dispatcher, 559
 Display profile, 536
 Distance
 Maximum, 313
 Distance costs, 274, 311
 Distance determination, 131, 152
 Distributed planning, 225, 228
 Distribution channel, 100
 Division, 100
 Document flow, 252
 Document management system, 217
 Door-to-door, 46, 49, 569
 Dossier, 188
 Driver, 145
 Maintenance, 150
 Qualification, 150
 DSLV (German Transport and Logistics Association), 56
 Duration costs, 275, 311
 Duration determination, 131, 152, 300, 312
 Duration of use
 Maximum, 313
- E**
-
- Earliness costs, 271, 275
 EDI (electronic data interchange), 77
 EDIFACT, 626
 Employee, 112
 End location, 313
 Enterprise service, 96, 620, 622
 Equipment group code, 214, 571
 Equipment type, 214
 ERP, 122
 Costing, 130
 Costs, 280
 System, 282
- ERP-TM master data transfer, 113
 ESR (Enterprise Services Repository), 620
 Event confirmation, 534
 Event group, 548, 550
 Event handler, 505, 516, 579
 Activity method, 528
 Detail overview, 533
 Header, 516
 Historical data, 522
 Life cycle, 506
 List, 530
 Overview, 531
 Resource, 544
 Set, 516
 Shipment, 542
 Shipment request, 541
 Tendering, 547
 Tour, 546
 Type, 506, 520, 553
 Event Management, 222, 243
 Event message, 507, 516
 Profile, 536
 Event type, 514
 Message, 515
 Execution organization, 101
 Expected event, 513, 518
 Profile, 520
 Expected events history, 525
 Export dispatcher, 561
 Extension table, 521
 External billing system, 101
 External communication, 168
 External logistics network, 36
 Extraction function, 512, 513
 Extractor, 553
- F**
-
- Factory calendar, 148, 263, 268
 Fast entry, 555
 FCL (Full container load), 46, 48, 213, 555
 Transport process, 559
 Feeder port, 608
 Feeder transportation, 608
 FEU (forty-foot equivalent unit), 602
 FIATA, 60
 Filter, 184
 Fixed costs, 274, 311
 Flight number, 251
 Form determination, 158
 Form printing, 162

- Forwarders
Acting as carriers, 20
 Forward scheduling, 303
 Freight agreement, 23, 415
 Freight codes, 104
 Freight contract, 23
 Freight forwarder, 19, 20, 23, 109
Acting as a carrier, 20
 Freight order, 284, 322
 Freight request, 173, 189, 237
Activate, 239
Freight unit, 239
Transportation costs, 239
Transportation proposal, 239
 Freight space booking, 318
 Freight space capacity, 317, 568
 Freight unit, 175, 189, 223
Building, 177, 226, 572
Bulk product, 223
Full container, 223
General cargo, 223
Sequence number, 225
Transportation restrictions, 224, 303
 Freight unit building rule, 158, 227, 572
Determination, 227
 Full container, 213
 Full container freight, 223
 Full container load handling, 555
 Full costs, 22
 Functional focus, 27
- G**
-
- General cargo freight, 223
 General cargo transportation, 587
 Geographical selection attributes, 264
 German Federal Office for Goods, 53
 GIS, 152
Quality, 152
Tools, 131
 Goods description, 187
 Goods type, 187
 Goods wait time, 136, 312
Maximum, 136, 139
Minimum, 136, 139
 GR/IR clearing account, 480
- H**
-
- Hague Protocol, 64
 Handling resource, 121, 146, 312
Capacity, 312
 Hand scanner user interface, 533
 HDE (German Retail Federation), 56
 HGB, 55
 Home area, 91
 Horizon, 263
 House Airway Bill (HAWB), 63
 House bill of lading, 245
 House Sea B/L, 578
 HS code, 106
 Hub, 42, 43, 47
 Hub and spoke system, 42
- I**
-
- IATA (International Air Transport Association), 45
agent code, 110
 ID number, 110
 IFCSUM, 237, 626
 IFTMBC, 626
 IFTMBF, 626
 IFTMIN, 237, 626
 IGS interface, 597
 Import dispatcher, 561
 Inbound, 121
 Incompatibilities, 146, 155
 Incompatibility, 170, 278, 279, 313, 343
Type, 170
Violation, 172
 Incoterm, 22, 200, 215, 249, 362
Delivered at frontier, 587
 InfoCube, 502
 Info data extractors, 513
 Inland waterway transportation, 608
 Integration Directory, 629
 Integration model, 116, 626
 Integration Repository, 629
 Integration scenario, 629
 Interface objects, 629
 Intermediate stop, 275, 313
 Intermediate stop costs, 275
 Intermodal, 24, 28, 31
 Internal activity allocation, 21
 Internal activity allocation (IAA), 21
 Internal order, 325
 Intrazone lane, 128, 565
 Invoice item, 472
 Invoice verification, 586
 Invoicing, 357, 586
 Invoicing party, 403
 Invoicing transportation charges, 467
 ISO containers, 37
 ISO norm 668, 37
 Item data, 204, 211

IT system, 94

J

Just-in-time, 27

K

Kanban delivery cycle, 27

L

Land freight, 555
 Lateness costs, 271, 275
 Layout settings, 292
 LCL (less than container load), 46, 48
 Legacy systems, 94
 Length of stay
 Maximum, 283, 312
 LES (Logistics Execution System), 65
 Lifecycle status
 Shipment request, 196
 Line haul, 43, 565
 Linkmatrix display, 183
 Load, 39
 Loading, 255
 Loading capacity
 Maximum, 313
 Loading costs, 311
 Loading duration, 300, 312
 Loading time, 158
 Load planning, 304
 Load transfer center, 588
 Local transportation, 31
 Location, 72, 73, 120, 564
 Location list, 299
 Location transportation lane, 128
 Location type, 116, 120
 Logistics service provider, 19, 71
 Long haul, 591
 Transportation, 42
 Vehicles, 592
 LSP IT landscape, 97
 LTL, 555, 587

M

Main bill of lading, 245
 Maintain Shipment Request, 627
 Map, 295
 Master B/L, 245, 577
 Master data, 99
 Master data object, 614
 Matching traffic flows, 23

Material, 104
 Material group, 104
 Material master, 104, 188
 Material number, 187
 Means of transport, 143
 Active, 143
 Combination, 152
 Hierarchy, 143
 Maintenance, 150
 Passive, 143
 Type code, 214
 Measurement history, 525
 Message interface, 629
 Message type, 629
 Metaheuristic, 310
 Milk run, 33, 43
 Modeling tool, 623
 Mode of transport, 44
 MRN (Movement reference number), 216
 Multimodal transportation, 41
 MultiProvider, 502
 Multistep procedure, 527

N

Node, 616
 Non-delivery charges, 345
 Non-delivery costs, 273, 311
 Non-vessel operating common carriers (NVOCCs), 46
 Notes, 187, 216
 Number range, 245
 NVOCC, 46
 NWBC (NetWeaver Business Client), 88, 89
 screen areas, 91

O

Objective function, 311
 Object services, 93
 Offset, 263
 On-carriage, 585
 One-step optimization, 277
 One-step planning, 258, 307
 One-time locations, 123
 Opening times, 312, 593
 Open platform, 96
 Open tendering, 354
 Operating time, 311
 Optimization, 65, 68, 70, 73, 305
 TSP selection, 345

- Optimization algorithm, 253
 - Optimization problem, 310
 - Optimizer runtime, 277, 279
 - Optimizer settings, 172
 - Optimum
 - Global*, 343
 - Order activation, 177
 - Order business objects, 180
 - Order completion, 177
 - Order confirmation, 177
 - Order entry, 176
 - Ordering party, 109, 194
 - Order management, 173
 - Order objects, 173
 - Order processing, 177
 - Order receipt, 173
 - Operations*, 176
 - Order settlement, 178
 - Order status tracking, 539, 540
 - Organizational data, 203
 - Organizational model, 558
 - Organizational structure, 99, 557, 558
 - Orientation type, 331
 - Outbound, 121
 - Output control, 157
 - Outsourcing, 31
 - Subcontracting*, 29
 - Overdue events, 534
 - Overnight, 36
 - Overnight freight, 43
- P**
-
- Package, 187
 - Packaging information, 213
 - Packing list, 570
 - Packing units, 205
 - Parameter, 513
 - Parameter list, 518
 - Partial load, 40, 47
 - Passenger Aircraft (PAX), 44
 - Payment terms, 471
 - Payment transactions, 110
 - Peer-to-peer tendering, 352
 - Penalty charges, 345
 - Penalty cost factors, 275
 - Penalty costs, 130, 311
 - Personalization, 90, 182
 - Personalization activities, 90
 - Personal object work list (POWL), 180
 - Define new query*, 184
 - Filter*, 184
 - Table display*, 183
 - Planning, 101, 253, 289
 - Access options*, 289
 - Layout*, 292
 - Manual*, 299
 - Planning costs, 130, 158, 273
 - Planning horizon, 230, 268
 - Planning interface, 254, 290, 295
 - Configuration*, 291
 - Planning organization, 101
 - Planning preview, 300
 - Planning profile, 172, 228, 267, 572
 - Planning result, 303
 - Planning strategy, 258, 269, 277
 - Own*, 259
 - Plug-in function module, 528
 - Point of departure, 199
 - Portal, 88
 - Post Processing Framework (PPF), 161, 235, 248, 499
 - Action*, 162
 - Action definition*, 249
 - Action profile*, 236, 248, 501
 - Condition*, 248, 499
 - Configuration transaction*, 165
 - Method call*, 169
 - Monitor*, 163
 - POWL
 - resources*, 146
 - Pre-carriage dispatcher, 561
 - Pre-carriage planning, 580
 - Preliminary order plan, 177
 - Prepacking, 35
 - Prepaid, 561
 - Prepayments of charges, 589
 - Split*, 589, 591, 598
 - Pricing, 357
 - Primary distribution, 32
 - Print document, 248
 - Field assignment*, 249
 - Printer determination, 158
 - Priority, 130, 281
 - Process, 555
 - Process costs, 38
 - Processing step history, 533
 - Processing steps, 525
 - Product ID, 205
 - Production disposal, 32
 - Production supply, 32
 - Product master data, 104, 205
 - Profiles for expected events, 523
 - Profitability, 587
 - Profitability calculation, 20, 21

Pro forma invoice, 570
 Pro forma invoice document, 468
 Proof of delivery, 243
 Proposal list, 282
 Proxy, 626
 Purchase order for external services, 478, 484
 Purchasing group, 100
 Purchasing organization, 100
 Push principle, 35

Q

Qualification, 149
 Quantity costs, 274, 311
 Queries, 503
 Query, 184
 Query view, 182
 Adjustment, 182
 Quotation, 173, 240
 Attributes, 240
 Quote within the framework of tendering, 316

R

R/2, 65
 R/3, 65
 Rail, 602
 Railway car, 213
 Ranking list, 309
 Rate table, 463
 Ready for Invoicing, 476
 Receiving event messages, 526
 Region-specific systems, 95
 Register display, 183
 Registration number, 214, 571
 Regulatory requirements, 188
 Relevance condition, 553
 Reported event, 518
 Requested dates, 199
 Request for quote, 316
 Request ID, 513
 Requirements horizon, 262
 Requirements profile, 260, 262
 Rescheduling, 298
 Resource, 296, 565
 Resource assignment, 209
 Resources, 142, 187, 214
 Rest period, 51, 52
 Road train, 144
 Role
 System administrator for

transportation, 90
Transportation booking agent, 89
Transportation charge administrator, 89
Transportation charge clerk, 89
Transportation dispatcher, 89
Transportation execution clerk, 89
Transportation manager, 89
Transportation network administrator, 89
Transportation service provider, 90

Role and type codes, 246
 Role code, 190, 246
 Rolen concept, 89
 Roles, 88
 Rolling out, 43
 Roll loading, 43
 Roll-on/roll-off transport, 36
 Route, 43
 Routing, 230
 Rule, 554
 Rule processing, 527
 Rule set, 508, 518
 Rule set browser, 529
 Runtime Workbench, 629

S

Sales and Distribution, 102
 Order, 102
 Sales group, 100
 Sales manager, 103
 Sales office, 100
 Sales organization, 100, 197
 Sanctioned party list screening, 28
 SAPconnect, 165
 SAP Event Management, 505, 539
 Extractor, 553
 Message, 515
 Process, 507, 539
 Relevance conditions, 553
 Services, 631
 SAP GUI, 88
 SAP NetWeaver BW, 500
 SAP-Portal, 88
 SAP SCEM (Supply Chain Event Management), 76, 77, 505
 SAP TM 7.0, 250
 Schedule, 137, 311, 565
 Scheduled cargo traffic, 591
 Scheduled flight, 44
 Scheduling, 303
 SCM (Supply Chain Management), 68, 70

- SDN (SAP Developer Network), 632
- Sea freight, 555, 576
- Sea freight booking, 561
- Sea freight dispatcher, 559
- Sea freight order, 555, 556, 559
- Seaport, 608
- Sea voyage, 568
- Secondary distribution, 33
- Selection attribute, 260
 - Additional*, 265
 - Geographical*, 264
 - Time-related*, 262
- Selection model, 116
- Selection number, 187
- Selection profile, 536
- Separation of interests, 97
- Service, 104
- Service entry sheet, 478, 484
- Service modeling, 623
- Service-oriented architecture, 620
- Service product, 105, 108
- Service provider, 67, 68, 74
 - Invoicing*, 585
 - Selection*, 561
- Service requirement code, 108, 201, 246
- Session tab area, 91
- SFTB (Shipment Order, Freight Order, and Tour Builder), 81, 284, 285, 308, 324
 - Mode*, 268, 307
- Ship, 213
- Ship journey number, 251
- Shipment, 39, 174, 242
 - Change*, 244
 - Costs*, 243
 - Costing*, 130
 - Cost split*, 589
 - Create*, 244
 - Order*, 284, 322
 - Printing papers*, 243
 - Processing*, 626
- Shipment request, 173, 216, 329, 627
 - Activation*, 223
 - Administrative data*, 204
 - Advance confirmation*, 233
 - Attachments*, 216
 - Authorized consignee*, 211
 - Basic view*, 192
 - Blocking*, 232
 - Business object structures*, 185
 - Calculate cost-effectiveness*, 232
 - Calculating transportation costs*, 218
 - Check customer limit*, 232
 - Communication*, 235
 - Confirmation*, 233
 - Confirmation area*, 179, 233
 - Consistency check*, 222
 - Copy template*, 175
 - Costs and payment method*, 218
 - Creation of freight units*, 223
 - Creation options*, 175
 - Customer freight invoice*, 221
 - Data areas*, 178
 - Date time-spans*, 203
 - Desired data*, 179
 - Detail view*, 191
 - Display of the costs*, 231
 - Document status*, 195
 - Executed transportation activities*, 221
 - External item ID*, 205
 - Freight agreement*, 219
 - Freight unit numbers*, 220
 - Incomplete or inaccurate data*, 222
 - Item data*, 187, 204
 - Location/date indications*, 208
 - Notes*, 216
 - Organizational data*, 203
 - Origin of the printed data*, 235
 - Overview*, 197
 - Packaging materials*, 212
 - Planned transportation activities*, 221
 - Planning*, 223
 - Printed documents*, 234
 - Request area*, 178
 - Resource assignment*, 209
 - Shipper and consignee*, 203
 - Shipping type code*, 206
 - Standard business partner*, 211
 - Switching between basic and detail view*, 192
 - Total quantity*, 202
 - Tracking information*, 221
 - Transportation data*, 200
 - Transportation proposal*, 228
 - Value assignment text*, 216
 - Values*, 202
 - Views*, 191
 - Work area*, 178
- Shipment request category, 197, 246
- Shipment request entry
 - Mode-specific*, 250
- Shipment request items, 205
- Shipment template, 240
- Shipment time window, 199

- Shipment tracking, 242, 243, 539, 542, 579
 - Ship name, 251
 - Shipper, 70, 109, 194, 203
 - Consignee*, 203
 - Shipping type code, 108
 - Ship schedule, 565
 - Short-haul transportation, 42
 - SLD (System Landscape Directory), 629
 - Solution Map, 632
 - SOA strategy, 620
 - Source, 194
 - Speed, 151
 - Split quantity, 572
 - Spool, 165
 - Stage of shipment, 214
 - Creation*, 215
 - Standard Carrier Alpha Code, 110
 - Standard container, 568
 - Standard location type, 120
 - Start location, 313
 - Statistical goods number, 104
 - Status profile, 517
 - Status tracking, 539
 - Stop sequence, 299
 - Strategic Freight Management (SAP SFM), 79
 - Strategy, 281
 - Subcontracting, 23, 577
 - Supplier Freight Invoice Request Processing, 626, 405
 - Supplier invoice, 561
 - Supply Chain Management Solution Map, 632
 - Swap body, 213
 - System administrator for transportation, 90
 - System landscape, 94
 - System parameters, 516
- T**
-
- Tactical focus, 27
 - Tariff, 418
 - Tax classification, 110
 - Taxes, 439
 - TCM (Transportation Charge Management), 358
 - Absolute price*, 458
 - Accruals*, 478
 - Actual costs*, 382
 - Additional bill-to party*, 365
 - Additional invoicing party*, 403
 - All master data*, 411
 - Allocation logic*, 385
 - Analysis of the TCCS*, 413
 - Architecture*, 411, 469
 - Assigning condition types*, 493
 - Assigning services*, 493
 - Automated invoice creation*, 391
 - Automated invoicing*, 407
 - Automated transportation service provider selection*, 409
 - Base scale*, 457
 - Bill-from party*, 469
 - Billing document*, 476, 485
 - Bill-to party*, 361, 363, 469
 - Business partner group hierarchy*, 417
 - Business partner hierarchy*, 435
 - Business system group*, 484
 - Calculate Profitability*, 359, 380
 - Calculation base*, 459, 460
 - Calculation base date*, 361
 - Calculation date*, 374
 - Calculation method*, 453
 - Calculation-relevant data*, 377
 - Calculation resolution base Freight*, 395
 - Calculation rule*, 464
 - Calculation sheet*, 361
 - Calculation times*, 377
 - Calculation type*, 458
 - CFIR*, 389
 - Change document*, 380
 - Charge element*, 370, 413
 - Charge element type*, 437
 - Charge management view*, 414
 - Charges and Method of Payment*, 361
 - Charges tab*, 367
 - Check Customer Limit*, 359, 387
 - Collective invoicing*, 393
 - Compare High/Low Value*, 444
 - Condition technique/BRF+*, 423
 - Consistency check*, 474
 - Consolidate freight invoice requests*, 391
 - Contracting party*, 417, 436
 - Contractor*, 416, 434
 - Contribution margin I*, 382
 - Contribution margin II*, 383
 - Cost assignment methods*, 386
 - Create Invoice Request*, 359
 - Creation of accruals*, 468
 - Currency*, 372
 - Currency profile*, 372

- Data accesses, 423*
- Data model, 367*
- Deactivating charge elements, 376*
- Decoupling, 412, 467*
- Deleting charge elements, 376*
- Determination class, 424*
- Determination logic for freight agreements and tariffs, 432*
- Determination method, 460*
- Document type for invoice, 470*
- Dynamic credit line check, 387*
- Enforced recalculation, 390*
- Estimate Individual Price Limit, 408*
- Estimate Profitability, 359*
- Estimate Profitability, 380*
- Evaluated receipt settlement, 468, 478*
- Evaluate Single Charge Element, 444*
- Exchange rate, 374*
- Fixation Code, 365, 376*
- Freight agreement, 361, 413, 415*
- Freight document as a superordinate document, 474*
- Freight request, 393*
- Grouping rule, 449*
- Grouping Rule for Resolution Basis, 430*
- Improved profitability calculation, 385*
- Incoterms 2000, 362*
- Information for each charge element, 371*
- Interaction of objects, 411*
- Internal freight agreement, 399*
- Internal invoice request, 401*
- Internal transportation charges, 358*
- Invoice item, 471*
- Invoice request, 389*
- Invoice verification, 478, 488*
- Invoicing party, 403*
- Limits for each freight agreement, 387*
- Log, 360*
- Manual charge element, 452*
- Nest TCCS, 444*
- Order receipt, 359*
- Organizational unit, 399, 416, 433*
- Payee party, 469*
- Payer party, 469*
- Planned costs, 382*
- Positive/Negative indicator, 438*
- Precondition rule, 448*
- Precondition rule /SCMTMS/ FREIGHT_ONCE, 395*
- Priorities, 418, 433*
- Proforma invoice, 468*
- Purchase order for external services, 480, 489*
- Purchasing business area, 492*
- Rate, 371*
- Rate determination for each charge element, 452*
- Rate table, 361, 455*
- Recalculation, 474*
- Reference transportation service provider, 384, 408*
- Relative price, 458*
- Resolution base, 440, 446*
- Resolution base FREIGHT, 446*
- Resolution base restriction, 446*
- Resolution base SHIPMENT, 446*
- Resolution base TCP_REQUEST, 442*
- Resolution instruction type, 444*
- Resolution restriction rule, 447*
- Resolution Restriction for Reference Object Category, 447*
- Rounding rules, 432*
- Resolution Restriction for Reference Object Type, 447*
- Rule for Charge Calculation Exclusion Logic, 432*
- Rule for Charge Calculation through Formula, 431, 452*
- Rule for Freight Agreement Determination - Exclusion, 426*
- Rule for Freight Agreement Determination - Standalone, 425*
- Rule for Rate Table Determination Rules, 430, 452*
- Rule for Resolution Restriction Rules, 429*
- Rule for Tariff Determination - Exclusion, 427*
- Rule for Tariff Determination - Standalone, 426*
- Rule for TCCS Item Applicability, 428, 448, 464*
- Rule for TCCS Item Applicability - Group, 428*
- Rule maintenance, 422*
- Rules and conditions, 413*
- Sales business area, 492*
- Sales Partner role, 397*
- Same-scale, 457*
- SAP TM assignment tables, 490*

- Scale*, 413, 455
- Scale base*, 456
- Scale maintenance*, 455
- Service entry sheet*, 480
- SFIR*, 405
- Shipment resolution base*, 440
- Subcontracting*, 401
- Supplier freight invoice request*, 405
- Tariff*, 361, 413
- Tariff conditions*, 418
- Tariff TCCS*, 418
- Tax indicator*, 439
- TCCS*, 370
- TCE*, 437
- TCE category code*, 438
- TCE subcategory*, 438
- Tendering*, 407
- To-scale*, 457
- Transferring an invoice*, 475, 478
- Transportation charge calculation sheet*, 370, 413, 437
- Transportation charge rate table*, 413
- Transportation proposal*, 410
- Transportation Service Provider role*, 403
- Transportation service provider selection*, 410
- Validity period*, 375
- Value indicator*, 438
- Virtual shipment order*, 384
- Template for shipment request, 173
- Tendering, 74, 283, 316, 581
 - Manager*, 582
 - Time limit*, 582
 - Type*, 582
- Tendering manager, 102, 349
- Tendering process, 349
- Tendering process configuration template, 316, 350
- Tendering strategy, 283
- Tendering tracking, 539, 547
- Tendering type, 352
- TEU (twenty-foot equivalent unit), 46, 602
- Text determination procedures, 249
- Text scheme, 216
- Text type, 216, 249
- Thermal container, 568
- Third-party logistics, 104
- Time window, 158, 312
 - Delivery/pickup*, 303
- Title area, 92, 192
- Total landed costs, 26
- Total quantity, 202
- Total value, 202
- Tour, 284, 298
- Tour status tracking, 539
- Tour tracking, 539
- TP/VS, 68
- Tracking, 76
- Tracking and tracing, 242, 243
- Tracking code set, 513
- Tracking ID, 513
- Tracking information
 - Shipment request*, 221
- Tracking number, 217, 245
 - Draw*, 246
 - Pre- and postfixes*, 246
 - Return*, 246
- Tracking process
 - Enhancement*, 551
- Tracking relevance, 507, 512
- Traditional freight forwarder, 20
- Transaction links, 92
- Transfer, 586
- Transportation zone
 - Postal code zone*, 125
- Transportation, 256
- Transportation activity, 189, 253, 254, 284
 - Executed*, 255, 298, 313
 - Planned*, 255
 - Status*, 256
- Transportation allocation, 128
 - Planning period*, 130
- Transportation booking agent, 89, 559
- Transportation chain, 41
- Transportation charge administrator, 89
- Transportation charge calculation sheet, 437
- Transportation charge clerk, 89
- Transportation cost element, 232
- Transportation costs, 231
- Transportation dispatcher, 89
- Transportation execution clerk, 89
- Transportation group, 116
- Transportation lane, 127, 128, 136, 280, 281, 564
 - Determination*, 131
 - Intrazone lane*, 128
- Transportation manager, 89
- Transportation mode, 151

Transportation network, 556
 Transportation network administrator, 89, 559
 Transportation order, 315
 Transportation Order Processing, 626
 Transportation plan, 253, 311
 Transportation proposal, 177, 228, 277, 278, 307
 Transportation Request Processing, 626
 Transportation requirement, 253
 Transportation restriction, 224
 Transportation revenue determination, 177, 231
 Transportation service provider, 90
 Transportation service provider selection, 130, 259, 265, 279, 298, 308, 315, 338, 581
 Transportation Supplier Quote Processing, 626
 Transportation unit resource, 145, 187, 213
 Transportation zone, 124, 127, 564
 Direct zone, 125
 Equivalent, 127
 Hierarchy, 124, 125, 127, 334, 343, 347
 Mixed zone, 125
 Overlapping, 127
 Region zone, 125
 Transport equipment, 108
 Product, 108
 Tracking, 539, 544
 Transport management services, 629
 Transshipment effort, 35
 Transshipment location, 109, 134, 136, 277, 311, 312, 314, 564
 Trip/flight number, 214
 Truck, 213, 565
 General cargo order, 587
 Trailer, 213
 TSP
 Ranking list, 340
 Selection, 338
 Selection optimizer, 345
 Selection settings, 345
 TSP selection
 Settings, 279
 Strategy, 281
 Type code, 246

U

UI service, 624
 Uncouple, 313
 Uncoupling, 256
 Uncoupling activity
 Uncouple, 144, 153
 UN hazardous material numbers, 106
 Unit price, 569
 Unloading, 255
 Unloading duration, 300, 312
 Unloading time, 158
 U.S. Department of Transportation, 54
 User interface, 88
 User profile, 536

V

Validation, 619
 Value added service, 20, 24
 Value chain, 18
 Vehicle
 Availability time, 313
 Vehicle booking, 318
 Vehicle combination, 313
 Vehicle resource, 143, 187, 213
 Vehicle resource combination, 144
 Vehicle Scheduling and Routing optimizer, 310
 Vehicle tracking, 539, 544
 Vendor account group, 116
 View selection area, 193
 View switch area, 93
 Volume weight, 246
 Voyage/flight number, 567
 VSR optimization, 258, 277
 VSR optimizer, 172, 310

W

Wait time, 283, 313
 Warsaw Convention, 64
 Web Dynpro ABAP, 88
 Workflow, 103, 232
 Working hours, 593

Y

Yield management, 23