

Script 3: Lead-to-Cash Business Process

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1 Lead-to-Cash Business Process

This teaching unit explains the Lead-to-Cash business process in the Sales and Distribution Application of the SAP system (SAP SD). We will show how SAP has implemented the central functionalities that are required to accomplish sales and distribution processes. Thereby, we will focus on the Lead-to-Cash business process that integrates different application areas of SAP SD. First, the organizational units and master data that are relevant to SAP SD are explained. Then we will focus on the Lead-to-Cash business process and explain how sales and distribution is implemented in SAP SD. Furthermore, integration points to other SAP applications are illustrated.

Educational Objectives in this Unit:

After this teaching unit, you will be able to:

- Explain the organizational levels of the Lead-to-Cash business process
- Explain the master data that is used by the Lead-to-Cash business process including the following elements:
 - o Material master data
 - o Customer master data
 - o Condition master data
 - o Output
- Run the Lead-to-Cash business process including the following elements
 - o Sales order creation
 - o Material requirements planning
 - o Production order processing
 - o Shipping and transportation
 - o Billing
 - o Customer payment
- Describe important interfaces with other SAP processes and applications
- List tools for analyses and reporting in the Lead-to-Cash business process

Scenario for the Case Study

In the following two figures, you can see the entire end-to-end business process, which you will independently accomplish in the practice chapters of this teaching unit. The color-coded process steps show that the main part of the Lead-to-Cash business process takes place in the Sales and Distribution (SD) application of the SAP system.

In the first practical section of this unit, you will create a new customer and define condition records for the combination of the customer and your products (Speedstar and Speedstarlett). After entering a sales order, you will perform the materials planning and manufacturing execution processes – which you already know from the Plan-to-Produce business process – for the Speedstarlett. Production is thereby carried out with reference to the sales order (Make-to-Order).

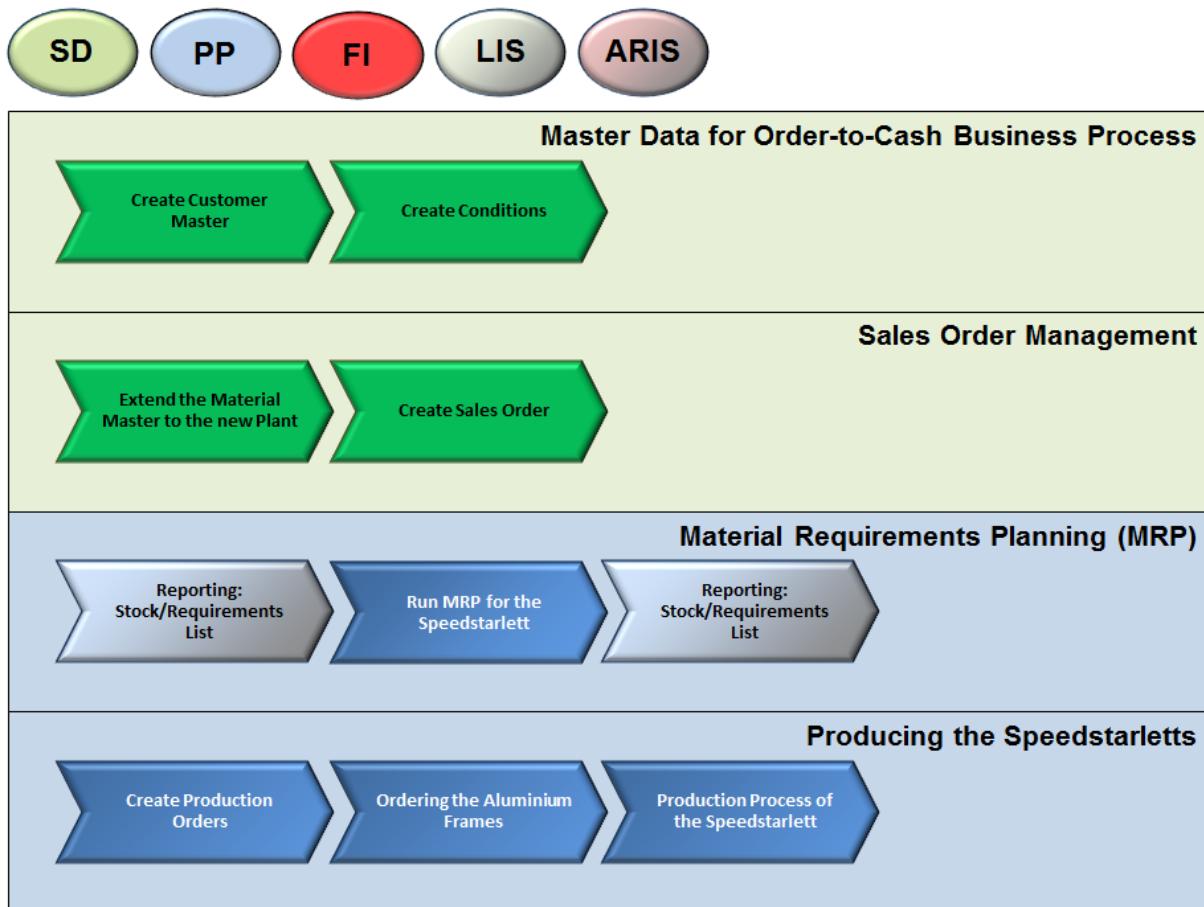


Figure 1: Process Overview: Lead-to-Cash Business Process (1)

After production, you will carry out dispatch handling and delivery of the product to the customer, as well as billing and entering incoming payments. Finally, you will get to know the reporting and analysis tool of the SAP sales and distribution module.

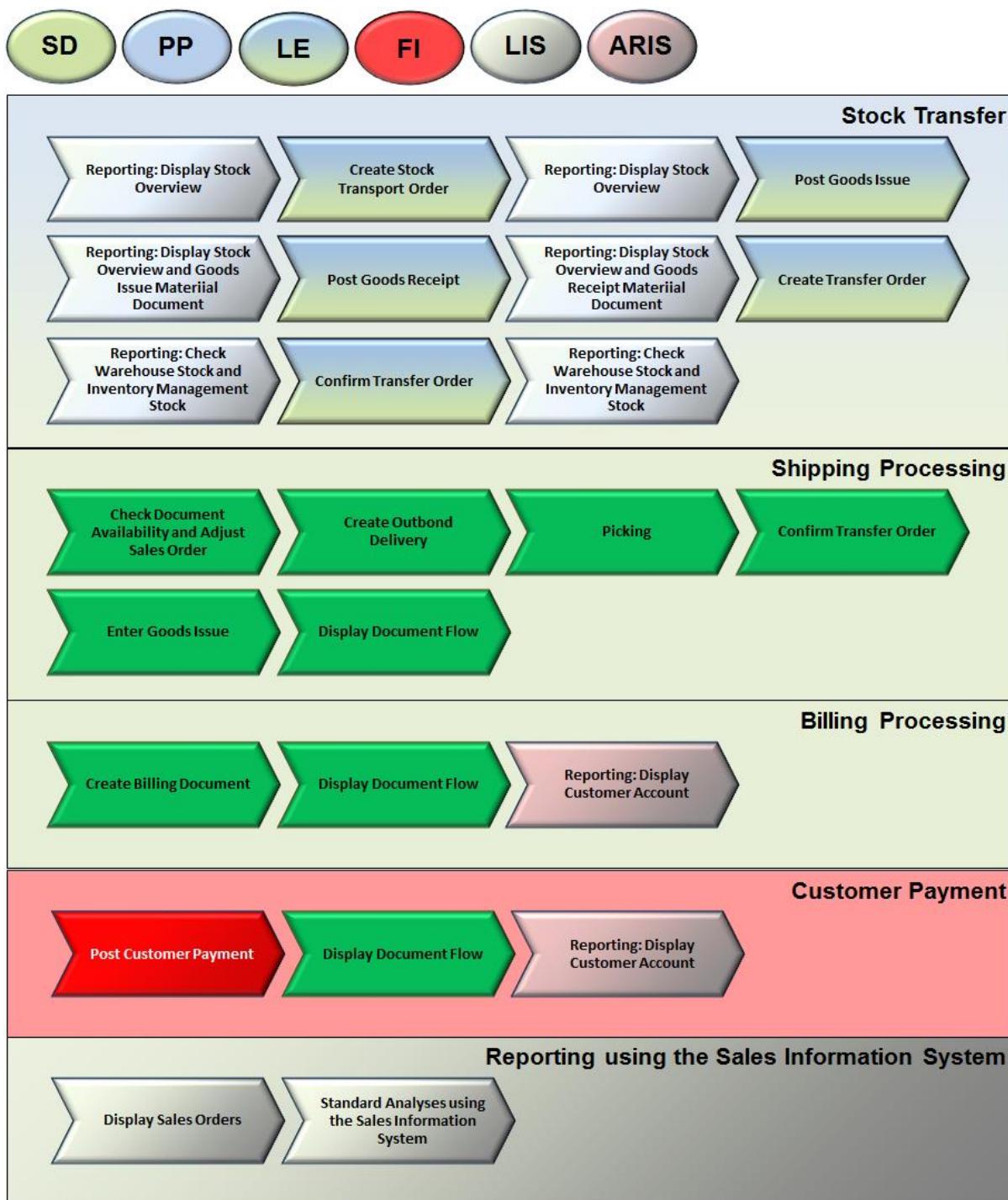


Figure 2: Process Overview: Lead-to-Cash Business Process (2)

2 Basic Data of Lead-to-Cash Business Process

In this section, you will learn about the organizational levels and master data that are relevant for the Lead-to-Cash business process. The Lead-to-Cash business process covers a wide range of functionality that support the complete sales cycle from pre-sales activities, processing sales orders and transportation, as well as billing and credit management. Thus, the main parts of this business process are accomplished in the Sales and Distribution (SD) application of the SAP system. However, there are important integration points to SAP MM (Materials Management), SAP CO (Controlling), SAP PP (Sales and Distribution) as well as SAP FI (Financial Accounting) that we will discuss later in this teaching unit.

2.1 Theory: Organizational Levels of SAP SD

**THEORY**

This section gives you an overview of the organizational model of SAP SD. There are several organizational levels that are relevant for SAP SD but primarily belong to another SAP application. Those organizational levels are explained first. Thereafter, the organizational levels that are only relevant for Sales and Distribution are described.

2.1.1 General Organizational Levels

The following organizational levels are relevant for the SAP application SAP SD. You already know some of these organizational levels.

Client

A **Client** is the highest-level organizational unit in a SAP system and constitutes an independent environment with its own set of tables and data, which are separate from other clients. Each SAP system can host multiple clients. Each client represents the enterprise, company, or business, depending on the size. Thus, a client is an organizationally, data model-wise, and legally closed unit. In SAP, clients are identified through their three-digit client number. The GBI Company is mapped in one client of a SAP system.

Company Code

Company structure determines whether a self-contained set of accounts is required for external reporting purposes or not. Therefore, SAP features the **Company Code** as an organizational level. According to commercial law, it is the smallest organizational unit for which a complete profit and loss statement can be issued for a self-contained set of books. If a business organization consists of more than one company (i.e., a group), company codes represent the individual companies of the group from an accounting point of view.

The company code is the central organizational element of **Financial Accounting**. However, it is relevant to almost any process in the SAP system, since most processes influence the accounting of the company. Thus, the company code is also relevant for **SAP SD**. For instance, in the Lead-to-Cash business process you sell products to customers. Upon delivery of the product, a goods issue is posted. The goods issue updates the inventory stock of this material on a quantity and value basis. While the quantity update is posted on the plant/storage location level, the value update occurs on accounts in financial accounting that are subject to the responsible company code.

The GBI has two company codes – one for the US headquarters (US00) and one for the German subsidiary (DE00). It is necessary to separate the two company parts from the point of view of financial accounting since each country has its own laws regarding financial statements and taxes.

Credit Control Area

A company can monitor customer credit line (credit limits), which are managed on the organizational level of **Credit Control Area**. A credit control area can be responsible for multiple company codes. The SAP system can react to events relevant to credit limitations with either warnings or delivery blocks.

The GBI is an enterprise with two companies. It has its headquarter in USA and a subsidiary in Germany. Each of the two companies is represented by a company code, (US00, DE00) for legal accounting and a controlling area (NA00, EU00) for cost accounting. The credit control area GL00 is responsible for credit limit checks of both companies. Thus, both company codes are assigned to this credit control area. This means that credit limits of customers of GBI are controlled by one instance. This, e.g., prevents a German customer from exceeding his credit limit and still placing orders at the US Company.

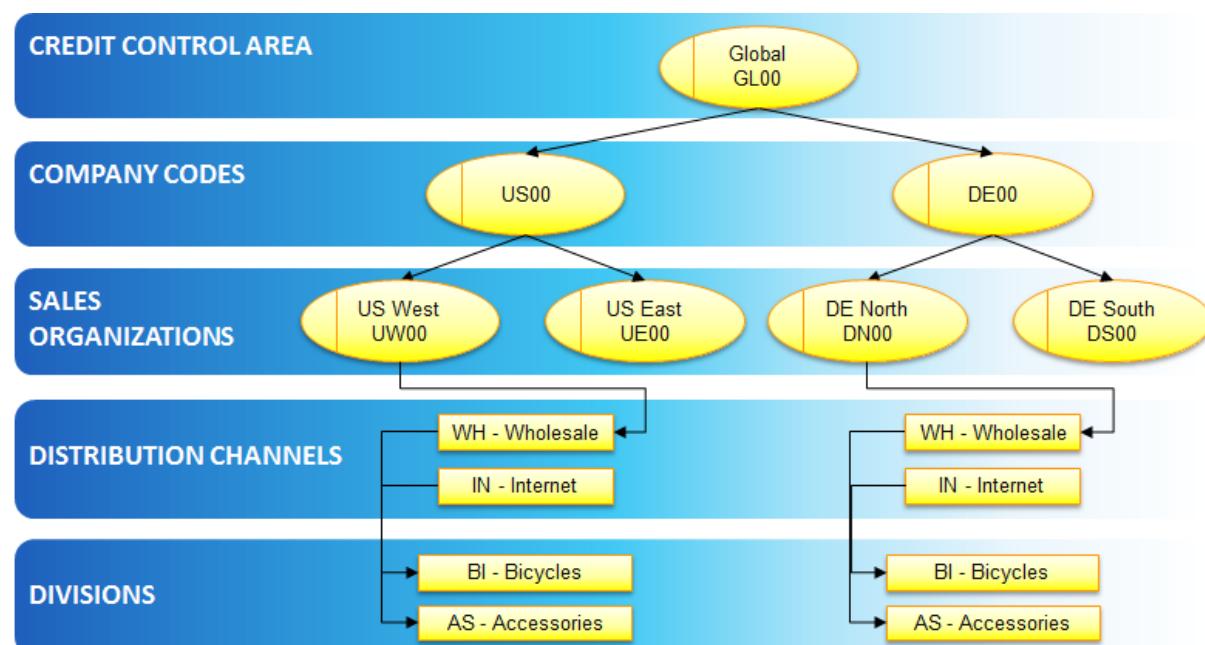


Figure 3: SAP Organizational Structures of Sales and Distributions (1)

2.1.2 Organizational Levels of Sales and Distribution

Besides, the afore-mentioned organizational levels, there are several organizational levels that are primarily relevant for the Sales and Distribution application of the SAP system.

Sales Organization

A **Sales Organization** is an organizational level in logistics that groups the company according to sales and distribution requirements. SAP uses sales organizations to distribute produced materials and offered services of a company. The responsibility of a sales organization may include legal liability for products and customer claims. Thus, a sales organization is the rough

structure for distribution. Additionally, the sales organization is used to group the market, e.g., regionally, nationally, and internationally. Moreover, the negotiation of *sales conditions* is carried out at sales organization level.

A sales organization is *uniquely* assigned to one company code. Multiple sales organizations can be assigned to one company code. Thereby, the company code manages the correct accounting of sales transaction value flows in SAP FI. If a company wants to use the SD application in an SAP system implementation, at least one sales organization must be created in the system's customizing.

A sales organization features individual master data and individual data relevant for SD. In **sales statistics**, a sales organization is the **highest aggregation level** for, e.g., sales order data. All items listed on an SD document, i.e., all items of a sales order, an outbound delivery or billing document belong to a sales organization.

The US Company of GBI has two sales organizations (UE00 – US East; UW00 – US West) with two divisions (BI – Bikes; AS – Accessories) assigned to each of them. Sales organization UE00 is thereby responsible for the sales and distribution of the company's products in the eastern part of the USA, whereas UW00 is responsible for the western part.

Distribution Channel

A **Distribution Channel** is the organizational unit to enable distribution of produced and marketable goods and services. Thus, it depicts the way in which products or services reach the customer. A distribution channel performs the following tasks:

- Defines responsibilities
- Ensures flexible pricing
- Is a selection criterion for sales statistics

A company may have multiple channels for the distribution of products. Since there are customers who request to receive goods over distinct channels, more than one distribution channel can be assigned to a sales organization. Contrary, a distribution channel can be assigned to multiple sales organizations (N:M). If you use the sales and distribution module in the SAP system, you need at least one distribution channel.

Typical examples of distribution channels are wholesale, retail, or direct sales. The sales organization UE00 only uses Wholesale (WH) as distribution channel, whereas UW00 also uses the Internet (IN) to sell products.

Division

Production of goods depends on size and structure of a company. Products, materials, and services can be assigned to **Divisions**. Thus, a division is a way of grouping materials, products, or services. The system uses a division to determine the *sales areas* assigned to a material or a service.

Since different sales organizations can distribute the same products, divisions can be assigned to multiple sales organizations. Contrary, one sales organization can contain multiple divisions

(M:N). If the sales and distribution module is used in the SAP system, at least one division must be defined.

A division is an organizational unit that can determine customer-specific agreements, e.g., price, partial delivery or payment conditions. You can also conduct statistical analysis by division.

The GBI has two divisions. All bicycle types that the GBI sells are grouped in the division Bicycles (BI). Complementary products are assigned to the division Accessories (AS).

Sales Area

Sales Areas are a particularly important organizational unit in the SAP system. The combination of sales organization, distribution channel, and division is called a sales area. That is, the sales area defines the distribution channel through which a sales organization sells products from a certain division.

A sales area is assigned to **exactly one company code**. This relation is created by the assignment of the sales organization to the company code in customizing.

Sales areas are used for analysis and pricing. For instance, a sales area determines conditions (i.e., pricing) for sales activities. Thus, each **sales** and **distribution document** (e.g., sales order) is assigned to exactly one sales area. This assignment **cannot** be changed after the document was saved. That is, when creating a sales document (e.g., sales order), the responsible sales area must be assigned!

When processing sales and distribution documents, the system uses various master data. These master data are accessed according to the sales area. This includes, for example, **customer master data, material master data, prices, and discounts**. Moreover, the system carries out various checks regarding the validity of entries according to the sales area.

The GBI Company in the USA encompasses six Sales Areas:

- Sales Organization UE00 – Division AS – Distribution Channel Wholesale
- Sales Organization UE00 – Division BI – Distribution Channel Wholesale
- Sales Organization UW00 – Division AS – Distribution Channel Wholesale
- Sales Organization UW00 – Division BI – Distribution Channel Wholesale
- Sales Organization UW00 – Division AS – Distribution Channel Internet
- Sales Organization UW00 – Division BI – Distribution Channel Internet

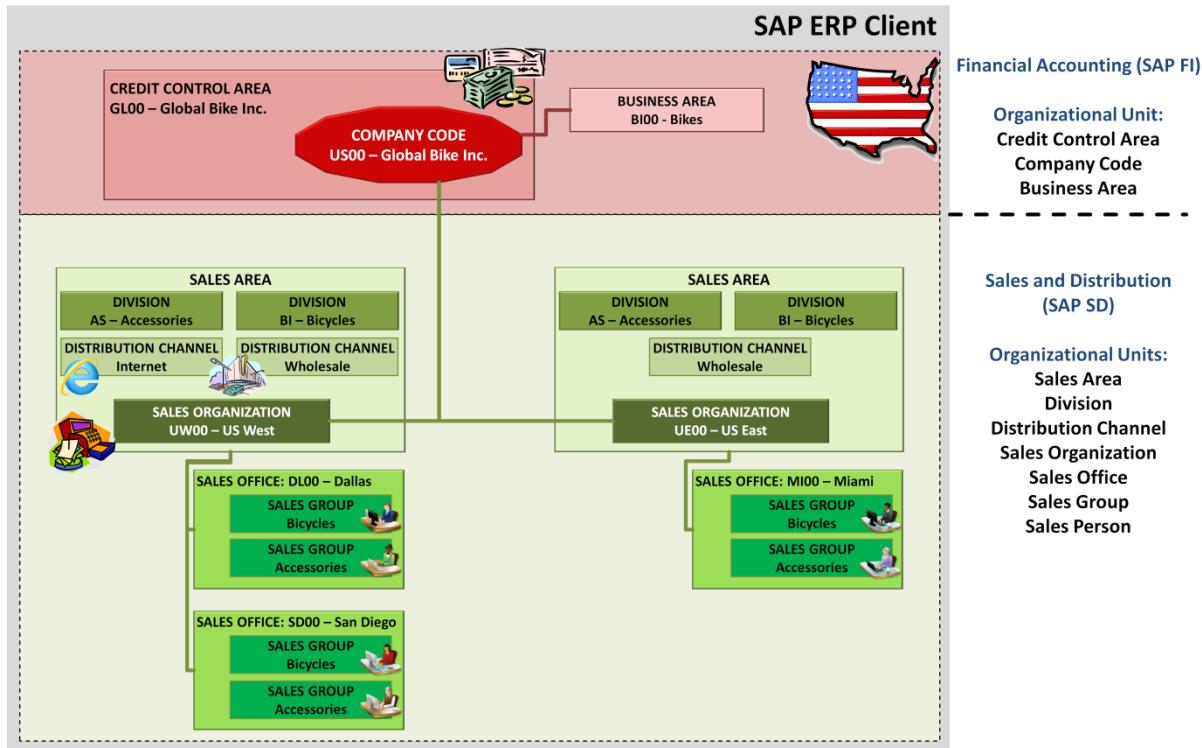


Figure 4: SAP Organizational Structures of Sales and Distributions (2)

Further SAP SD Organization Units

The organization of the company's sales force can be represented by the elements Sales Office, Sales Group, and Salespersons.

Sales Office

A **Sales Office** is used to define the geographical aspects of the organization in business development and sales. A sales office can be considered as a subsidiary and establishes contact between the company and the regional market.

Sales Group

The staff of a sales office may be subdivided into **Sales Groups**. For example, sales groups can be defined for individual divisions.

Sales Person

Personnel master records (SAP HCM) can be maintained for sales representatives in a company. In the personnel master record, the **Sales Person** is then assigned to the sales office and the sales group. Furthermore, it is possible to enter the system user name of the salesperson in order to allow mail to be sent to the salesperson.

Sales offices are assigned to sales areas. If a sales order is created for a sales office within a certain sales area, the sales office must be assigned to that area. The sales groups are assigned to the sales offices. The sales persons are assigned to the sales group and the sales office via the personnel master record.

2.1.3 Organizational Levels of Shipping and Transportation

Shipping and transportation in the SAP system is organized by plants. The **Plant** is the central organizational unit in logistics. From a logical point of view, plants structure a company in organizational terms, i.e., it distinguishes between different operating areas. A plant is used as a manufacturing facility for procurement, maintenance and/or planning locations, as well as a distribution center. From a commercial point of view, a Plant is a branch.

The following figure highlights the relevance of Plants and the necessary organizational assignments for the Shipping and Transportation process.

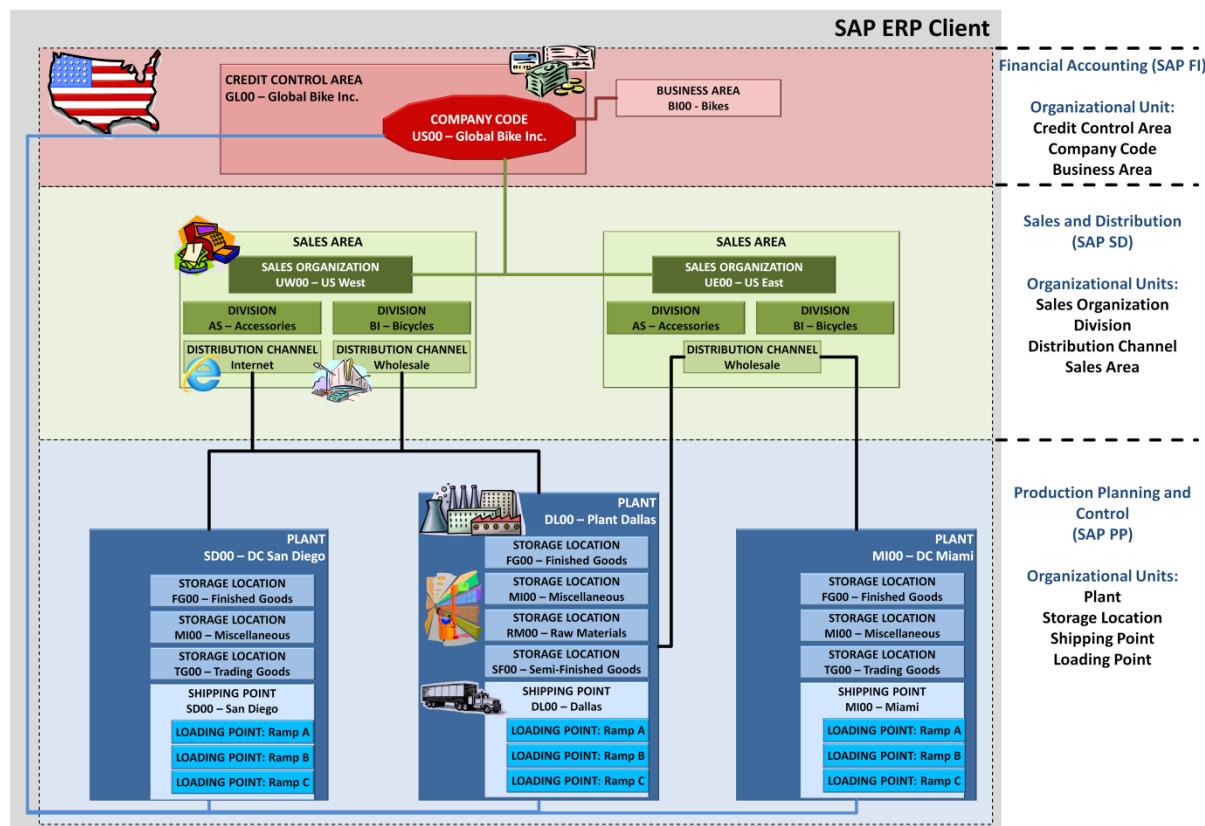


Figure 5: SAP Organizational Structures of Sales and Distributions (3)

Plant/ Distribution Center (here: Delivering Plant)

Plants are organizational units that can be used in all areas of logistics:

- In **materials management**, the focus is on material flow. From a materials management point of view, a plant is predominantly a storage location for material stocks.
- From a **production** point of view, a plant is a production facility.
- In Sales and Distribution, the plant is the location from which materials and services are distributed. In a plant, the relevant stocks are stored.
- For services distributed by a company, the plant is the location where services are rendered (e.g., an office).

In Sales and Distribution, the following should be considered regarding the role of plants:

- At least one plant must be created in the SAP system in order to be able to use the SAP SD application.

- The assignment between sales organization and plants does not need to be unique. However, a plant must always be uniquely assigned to **one company code**.
- If a plant is to be used as a **delivering plant**, it must be assigned to a sales organization and distribution channel.
 - o The combination of a sales organization and distribution channel is also referred to as a **distribution chain**.
 - o One plant can be assigned to several distribution chains. Several plants can be assigned to one distribution chain (N:M).
- The plant is required for determining **shipping points** if it is used as a delivering plant.

The GBI has three plants in the USA (and two plants in Germany). Thereby, only the plant in Dallas (DL00) is a manufacturing facility and delivering plant. The other two plants (MI00 – Miami, SD00 – San Diego) depict distribution centers and are used as delivering plants only. Therefore, the following assignments of sales organizations, distribution channels, and plants are maintained in the GBI:

- Sales Organization UE00 – Distribution Channel WH – Plant DL00 (Dallas)
- Sales Organization UE00 – Distribution Channel WH – Plant MI00 (Miami)
- Sales Organization UW00 – Distribution Channel WH – Plant DL00 (Dallas)
- Sales Organization UW00 – Distribution Channel WH – Plant SD00 (San Diego)
- Sales Organization UW00 – Distribution Channel IN – Plant DL00 (Dallas)
- Sales Organization UW00 – Distribution Channel IN – Plant SD00 (San Diego)

Shipping Point

Shipping is a module integrated in the sales and distribution process. The highest organizational level of shipping is the **Shipping Point**. The shipping point is responsible for organizing and executing the entire shipping processing. The shipping point can be e.g. a loading ramp, a mail depot, or a rail depot. Moreover, the shipping point can e.g. consist of a group of employees in charge of organizing (only) urgent deliveries. For each outbound delivery, a responsible shipping point must be entered, i.e., there can be no delivery without a shipping point.

The organizational assignment of shipping point is carried out at the plant level. A shipping point is assigned to one or multiple plants, and a plant can have multiple shipping points (N:M). A shipping point is a physical location and should be close to the delivering plant. This can also be appropriate for plants that are geographically close to each other.

In the organizational structure of the GBI, each plant has one shipping point (DL00, MI00, SD00).

Loading Point

Shipping points can be further subdivided into **Loading Points**. For instance, a shipping point can be subdivided in loading points; ramp A, ramp B, and ramp C.

Overall Assignment from Sales and Distribution

The following figure summarizes the relationships (including the cardinalities) between the central organizational levels from Sales and Distribution (SD), Materials Management (MM),

Logistics Execution (LE), and Accounting (FI) that are involved in sales and distribution processes:

- SAP MM:
 - o One plant has one or multiple storage locations assigned to it. A storage location always belongs to one plant (1:N).
 - o A plant can have multiple shipping points assigned to it. A shipping point can be assigned to multiple plants (N:M).
- SAP LE:
 - o A warehouse number can be assigned to one or multiple combinations of plant-storage-location. A plant-storage-location combination can always be assigned to only one warehouse number (1:N)
- SAP SD:
 - o A sales organization can have multiple distribution chains assigned to it. A distribution chain can be assigned to multiple sales organizations (N:M).
 - o A distribution chain can be assigned to one or multiple delivery plants. A delivery plant can be assigned to one or multiple distribution chains (N:M).
 - o A sales organization can have multiple divisions assigned to it. A division can be assigned to multiple sales organizations (N:M).
- SAP FI:
 - o A sales organization is uniquely assigned to a company code. A company code can have multiple sales organizations assigned to it (1:N).
 - o A plant is uniquely assigned to a company code. A company code can have multiple plants assigned to it (1:N).

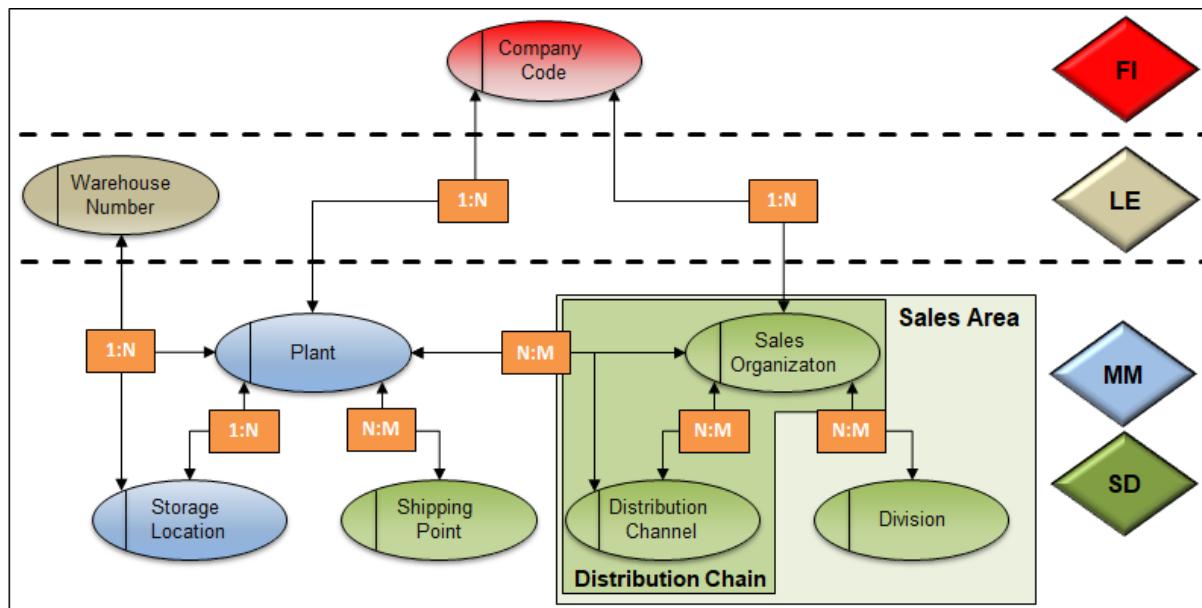


Figure 6: Overall Assignment from Sales and Distribution

2.2 Theory: Master Data in Sales Order Management



THEORY

You already have become acquainted with the concept of master data in the SAP system. Master data are used to provide information persistently about objects for multiple applications. In the sales and distribution scenario several master data are of particular interest. These are: Material Master Data, Customer Master Data, Condition Master Data.

2.2.1 Material Master Data

You have already learned that the material master contains all the information that is required to manage all aspects of a material in the SAP system. The material master contains all data relevant for a material, e.g., the material-ID, the description, the unit of measure, material weight and volume, standard price. Thus, it is relevant for and is used by most of SAP applications. Always consider the following when working with material masters:

- Material master data is organized in different views. Each view – except of the Basic Data views – is relevant for a different application and, in general, is maintained by the corresponding department.
- Material data – except of the Basic Data views – is maintained on the level of a specific organizational unit.
- Basic Data views contain material data that is valid on client-level. A material cannot be created twice in the system with the same material number to prevent inconsistencies.

The following shows examples of material master usage, the views relevant for the particular application and the organizational level the data of the specific view is maintained for:

Sales and Distribution	<p>Examples: Materials (finished products) that are sold to customers are entered in sales orders</p> <p>Views: Sales Org. Data 1; Sales Org. Data 2; General Plant Data</p> <p>Organizational Unit: Sales Organization</p>
Materials Management	<p>Examples: Materials (e.g., raw materials) that are procured from suppliers are entered in purchase orders. Materials that are received from suppliers or delivered to customers must update inventory quantities.</p> <p>Views: Purchasing; General Plant Data/Storage 1; General Plant Data/Storage 2</p> <p>Organizational Unit: Plant; Storage Location</p>
Production	<p>Examples: Materials that are planned are considered in SOP. Materials that are then manufactured are entered in production orders.</p> <p>Views: MRP1, MRP2, MRP3, MRP4, Work Scheduling</p> <p>Organizational Unit: Plant; Storage Location</p>
Plant Maintenance	<p>Examples: Materials that serve as spare parts are entered in maintenance orders.</p> <p>Views: Purchasing, MRP1, MRP2, MRP3, MRP4</p> <p>Organizational Unit: Plant; Storage Location</p>
Financial Accounting	<p>Examples: Materials that are received by suppliers or delivered to customers must update the financial accounting accounts for inventory value changes on the company code level.</p> <p>Views: Accounting 1; Accounting 2</p> <p>Organizational Unit: Company Code</p>
Controlling	<p>Examples: Material production costs are estimated in Product Cost Calculations by analyzing all BoM-components and routing operations. The costs of the components and the operation activities are subject to Controlling.</p> <p>Views: Costing 1; Costing 2</p> <p>Organizational Unit: Controlling Area</p>

Quality Management

Examples: Materials that are procured can be due to quality inspections upon a goods receipt.
Views: Quality Management
Organizational Unit: Plant; Storage Location

The following figure again illustrates the connections between the Material Master, the organizational units, and the views. Data maintained within one of those views may be valid for different organizational levels.

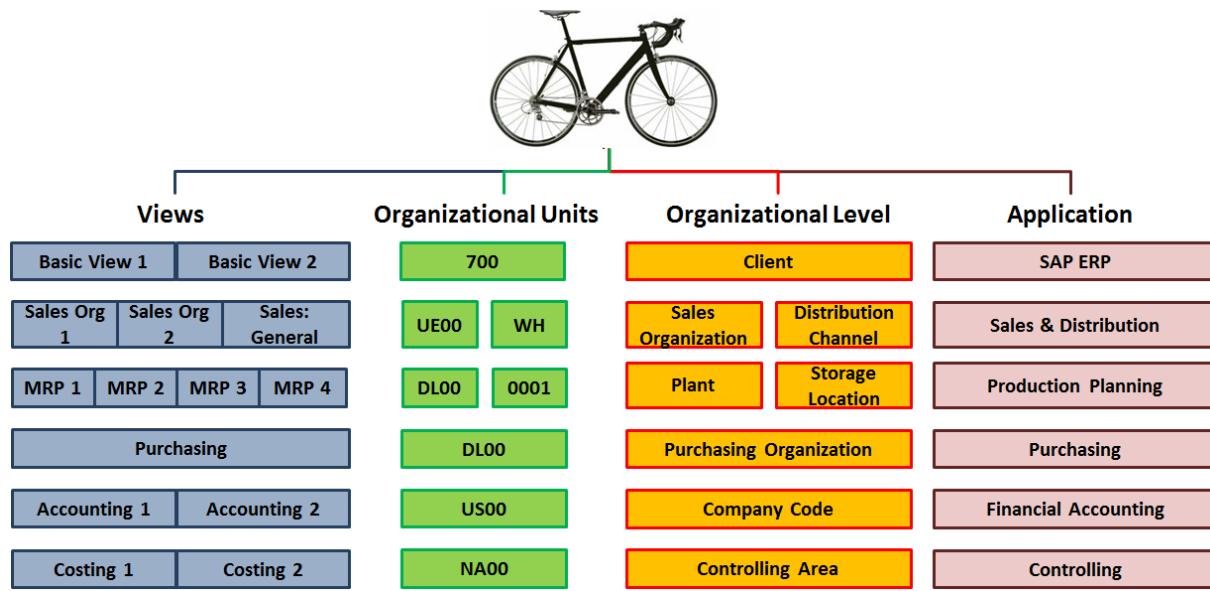


Figure 7: Material Master Data: Views, Organizational Levels, and Applications

For instance, data in the **MRP** view is maintained on the organizational level of plants, whereas data of the view **Sales** is maintained on the level of sales organizations and distribution channels. That is, if you maintain the Sales view of a material master for the sales organization UE00 (United States East) and distribution channel WH (Wholesale) only, then this sales data of the material is only valid for the sales organization UE00 and the distribution channel WH. Sales organization UW00 (United States West) cannot use this material; unless you create (extend) the material master data for this sales organization, too.

For the Sales and Distribution scenario the views that are displayed in the following figure are relevant. The highlighted fields are particularly important in this scenario:

- In the *Sales: Sales Org 1* view, you can enter the delivering plant, the division, and indicators for (sales) tax determination.
- In *Sales: Sales Org 2* view, you must set the item category, which is a characteristic that defines sales-relevant features of document items including planning, pricing, production, billing, contract, or commission relevance.
- In *Sales: General/Plant* view, you can specify whether and how the system should check availability of a material in sales documents and how to generate requirements for materials planning. Furthermore, you can set the transportation and loading group for the material, which are used for automatic route scheduling during sales order and delivery note processing and automatic shipping point determination for the item.

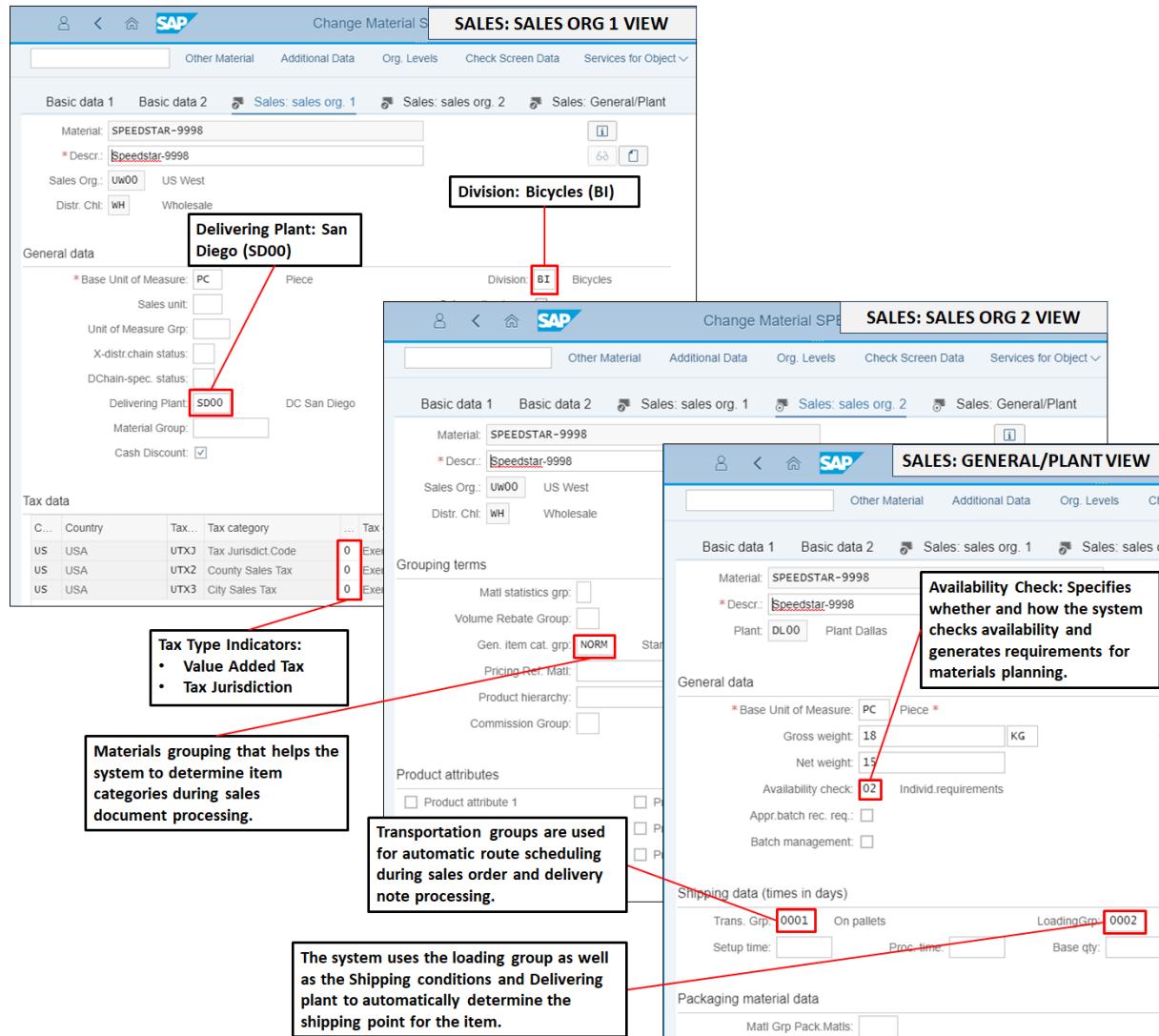


Figure 8: Material Master Views for Sales and Distribution: SAP-System-Screenshot

2.2.2 Customer Master Data

A customer is a business partner of the company to whom the company sells materials or services. For the interaction between the customer and the company, a business partner master data record (Only exception are CpD-Accounts for one-time use) is required for each customer. This master data record provides all information that is required to do business with the customer and to control how transaction data is posted and processed for the customer.

The interaction with a customer usually involves the departments sales (sales, contract closing, goods issue) and accounting (invoice, payment) of a company and the customer master data is usually maintained by these departments. Accordingly, the vendor master data is subject to Sales and Distribution (SAP SD) applications for sales processes and Financial Accounting (SAP FI) for billing / invoicing processes.

As already discussed in the introductory script, the classic supplier and customer master data from the SAP ERP system were finally and completely migrated to the new business partner concept with the S/4HANA system.

2.2.2.1 Relevant Business Partner Roles and Organizational Units in SAP SD

If a business partner acts as a **customer** to the company, at least the following three business partner roles are necessary. Each of these BP roles (except of the General BP role) is created on a certain **Organizational Level** (e.g., Company Code US00):

- The Business Role **Business Partner General** is created automatically for any business partner defined in SAP S/4HANA. In this role, all general information on the business partner such as Name, Address, Contact etc. is entered. This data is stored and available on **Client level** and, also ensures that the same business partner can exist only once in the system (preventing data redundancy)
- From an **accounting perspective**, a customer equals the company's crediting business partner. The *accounting data* is entered the business role **FI Customer** and is relevant for Financial Accounting (FI). Accordingly, this data is stored on **Company Code level**. Similar to the vendor master, a customer master can be created for a certain company code (e.g., US00). If the very same customer buys products from a different company part (e.g., DE00), the customer master must be additionally created (extended to) for the company code DE00.
- From a **sales and distribution perspective**, a customer is a sold-to party. The *sales data* is entered in the business role **Customer** and is relevant for Sales and Distribution (SD). Accordingly, the data is managed separately for each **Sales Area**. Again, similar to the vendor master, a customer master is created for a certain sales area (e.g., UW-WH-BI). If the customer wants to buy products from another sales area (e.g., UE00-WH-BI) the customer master is additionally created (extended to) for sales area UE00-WH-AS.

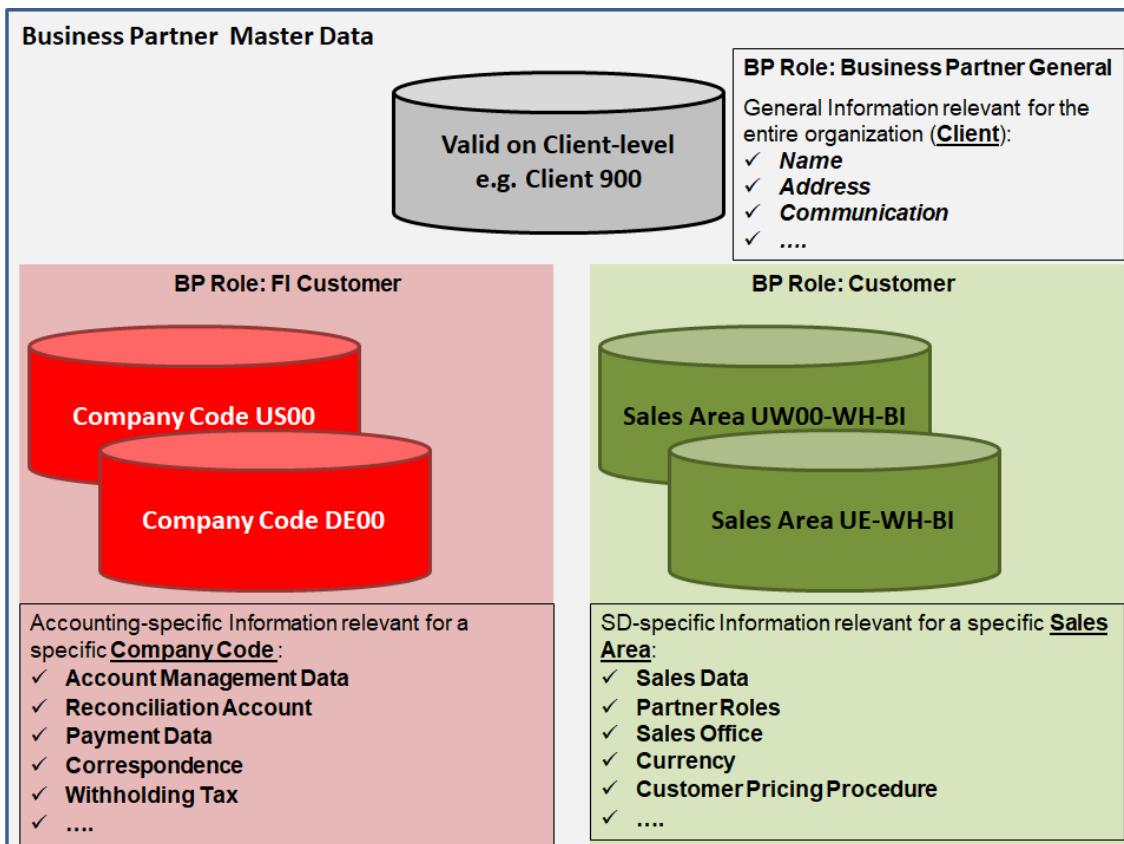


Figure 9: Customer Master Data: Business Roles and Organizational Assignment

2.2.2.2 Creating a Business Partner as Customer in SAP S/4HANA

The roles required for a business partner to be used in the Lead-to-Cash business process of the Sales and Distribution application (SAP SD) are

- **Business Partner General Role:** This role is created automatically upon creation of a business partner and holds all the *application-independent data* such as name, address communication, control data, bank data etc. This part of the business partner master data is defined on *client level*.
- **Customer:** This role corresponds to the sales-area-specific view of the ERP customer master data and is created on the level of *sales areas*. This BP role then controls the business partner's behavior in the sales, delivery, and billing processes. In this BP role, you enter data such as
 - o default currency,
 - o customer pricing procedure,
 - o or shipping conditions.

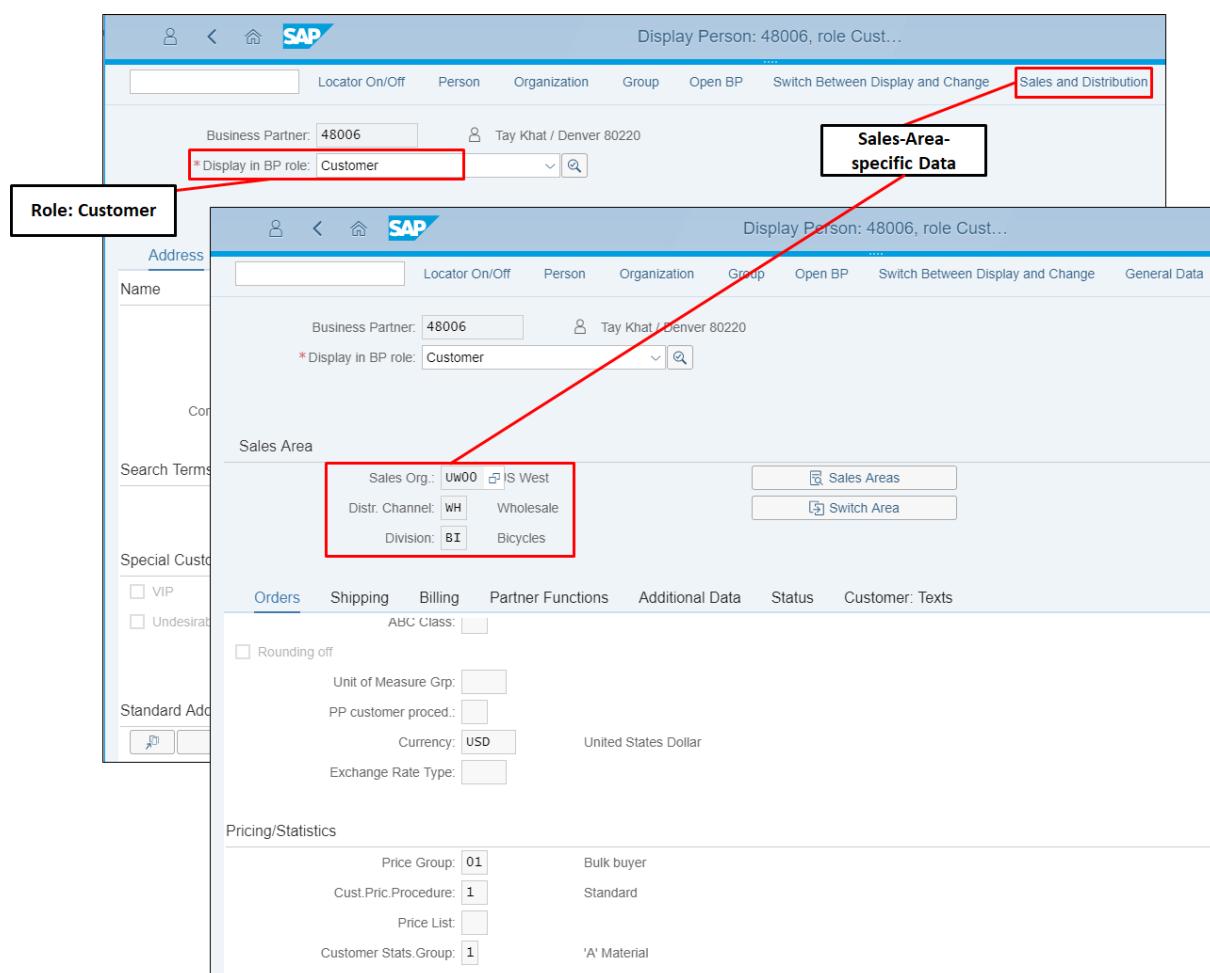


Figure 10: Role: Customer: SAP-System-Screenshot

- **FI-Customer:** This role corresponds to the company-code-specific view of the ERP customer master data and is created on the level of *company codes*. This BP role then controls the business partner's behavior in the billing and payment process. In this BP role, you enter data such as
 - o reconciliation account,

- payment terms and methods,
- tolerance groups,
- or name of important contacts related to the customer (e.g. clerks)

In the FI-Customer BP role you also assign a different **vendor number** or **customer number** to the business partner. This ID corresponds to the classic SAP ERP vendor and customer IDs and is later used in processes such as creating a sales order (customer) or a purchase order (vendor).

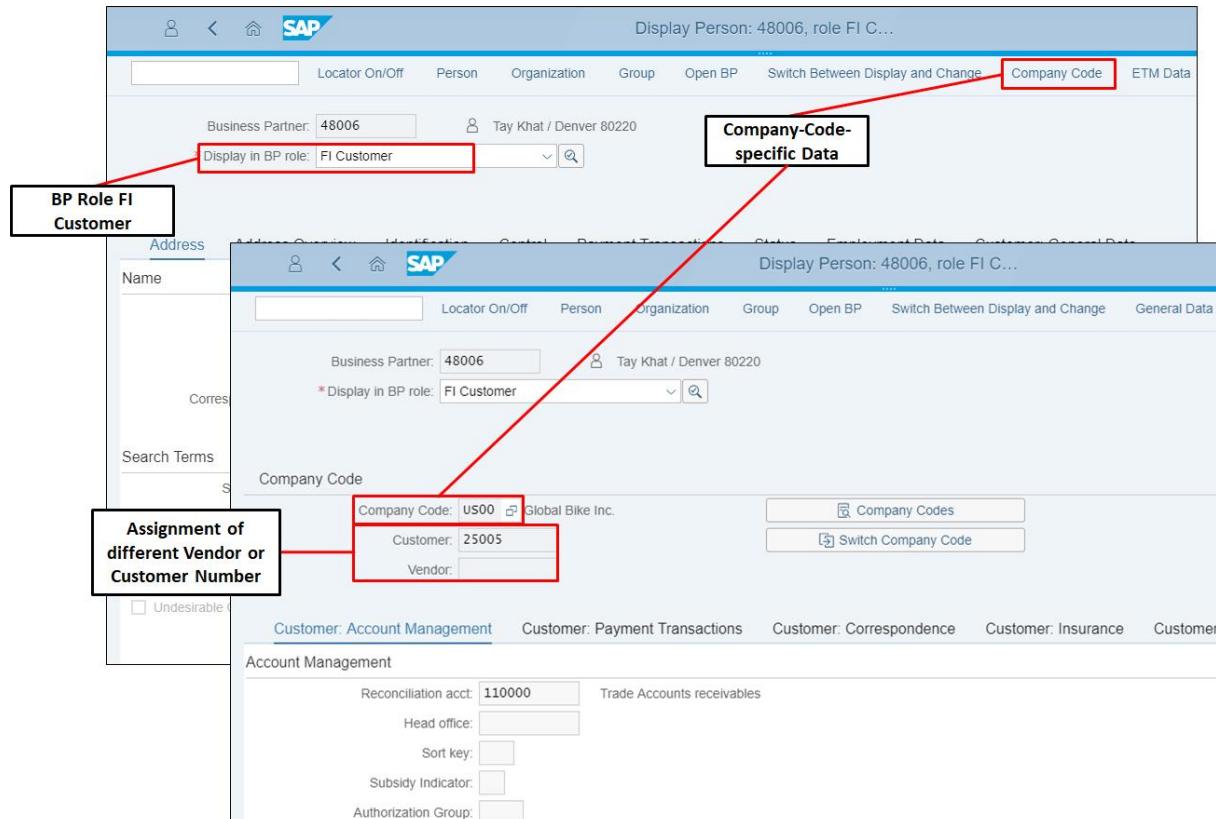


Figure 11: Role: FI-Customer: SAP-System-Screenshot

2.2.3 Condition Master Data (Pricing)

Condition master data includes prices, surcharges and rebates, freight and taxes. In the SAP system, condition master data (condition records) can be defined that depend on different data. For example, a material price can be maintained specifically for a customer or a discount can be defined that depends on the customer and the material price group.

In the **Customizing** of SAP Systems, in the area of pricing (condition technique), you can define the data for determining prices, surcharges, discounts, freight or taxes in sales documents with the help of **condition types**. Any available fields (e.g., document schema or customer schema) in a sales document (e.g., a sales order) can be defined as conditions for pricing. Frequently occurring cases are already set in the standard system of the SAP system.

When you maintain a price, surcharge, discount, etc. for a material or customer-material-combination later in the SAP **SD-Application**, you do this by creating a **condition master record**. With the condition master record, you can tell the SAP system, e.g.,

- material X is sold (to everyone) at the price of 300 USD
- or material X is sold to customer Y at the price of 275 USD

When creating a condition master record, you first need to select the appropriate condition type. This afore-mentioned customizing object controls the properties of the condition master record, which includes:

- Condition class, determines the type of condition e.g., price or discount
- Scales, determines whether scales are allowed and if yes, if a value or quantity scale is possible
- Level, determines whether the condition record is relevant for the sales document header and/or sales document item level
- Validity period, determines the time interval for which the condition record is valid

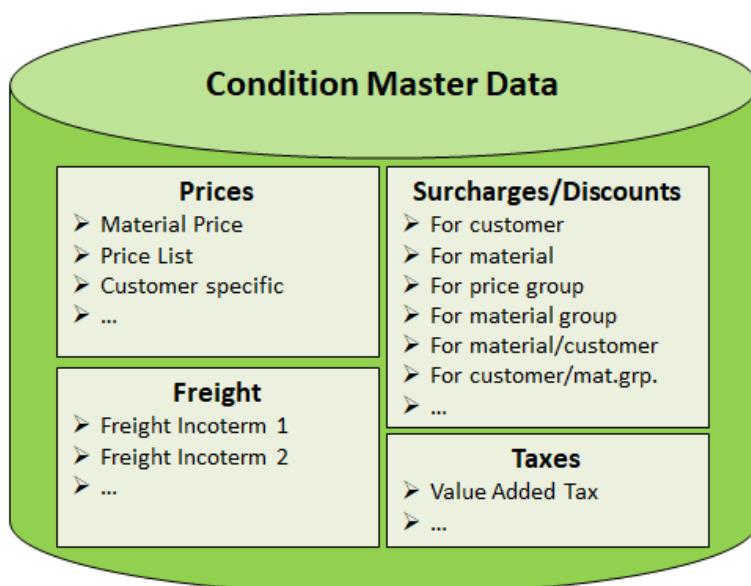
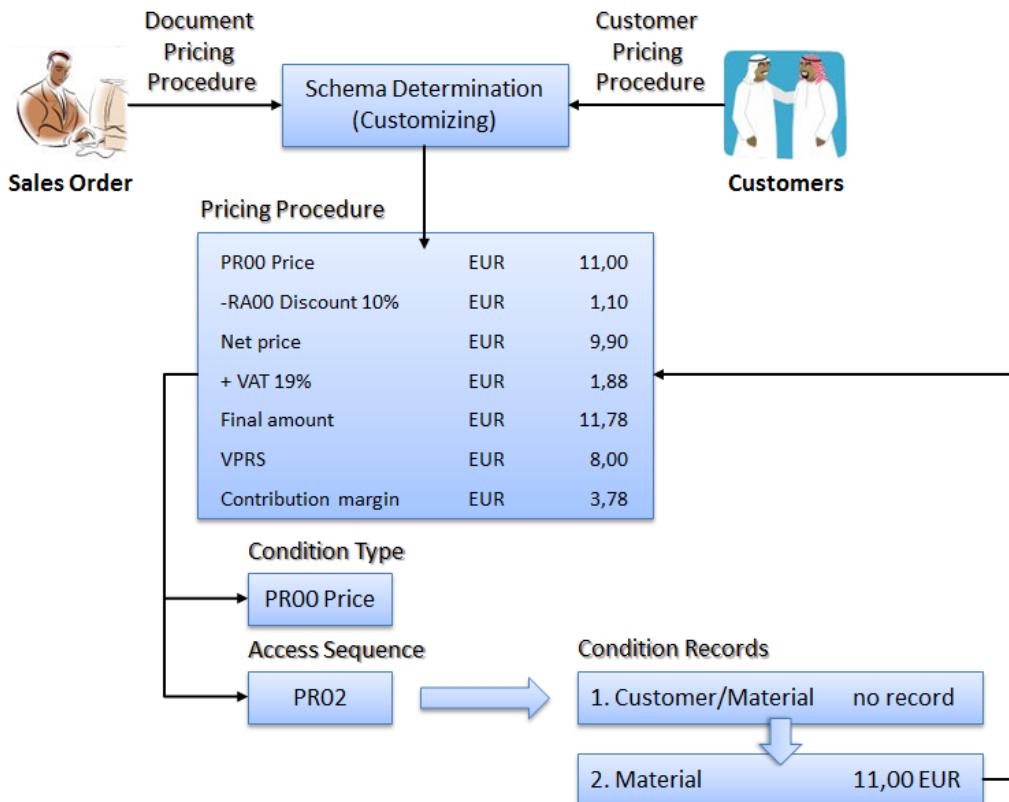


Figure 12: Condition Master Data

2.2.3.1 Elucidation: Pricing and Condition Technique in SAP Systems

 **ELUCIDATION**

The term **pricing** is used broadly for describing the calculation of prices (for external use by customers or vendors) as well as for costs (for internal purposes, such as cost accounting). Conditions represent a set of circumstances that apply when a price is calculated. Pricing is one of the central features of the sales and distribution components in the SAP system. In sales and distribution documents (e.g., customer orders) prices, conditions (discounts, etc.) and taxes are either determined automatically or manually.

**Figure 13: Condition Technique**

In the SAP system, pricing is done with the aid of the **condition technique**. The figure above illustrates the general principle of operation behind the condition technique. During document entry, the employee determines the **document type** (e.g., standard order), which, together with data from the **customer master data** (customer pricing procedure), determines the **pricing procedure** from a customizing table for this combination. The pricing procedure contains the **condition types**, which represent the price components (prices, conditions). In addition, an **access sequence** is defined for each condition type. The access sequence contains the **access keys**, in which the user may create the condition records. If a condition record exists in the system, its values will be applied to the order.

For example, a customer orders a certain quantity of a particular product on a certain day. The variable factors (the customer, the product, the order quantity, the date) determine the final price the customer gets. The information about each of these factors can be stored in the system as master data. This master data is stored in the form of *condition records*. Prices, surcharges and discounts, freights, and taxes are condition master data.

I...	CnTy	Name	Amount	Crcy	per	UoM	Condition Value	Curr.	Status	NumC...	AT
<input type="checkbox"/>	<input checked="" type="checkbox"/>	PR00	Price	3.000,00	USD	1	PC	300.000,00	USD		1
<input type="checkbox"/>			Gross Value	3.000,00	USD	1	PC	300.000,00	USD		1
<input type="checkbox"/>			Discount Amount	0,00	USD	1	PC	0,00	USD		1
<input type="checkbox"/>			Rebate Basis	3.000,00	USD	1	PC	300.000,00	USD		1
<input type="checkbox"/>			Net Value for Item	3.000,00	USD	1	PC	300.000,00	USD		1
<input type="checkbox"/>			Net Value 2	3.000,00	USD	1	PC	300.000,00	USD		1
<input type="checkbox"/>			Total	3.000,00	USD	1	PC	300.000,00	USD		1
<input type="checkbox"/>	<input checked="" type="checkbox"/>	SKTO	Cash Discount	0,000	%			0,00	USD		0
<input type="checkbox"/>	<input checked="" type="checkbox"/>	VPRS	Internal price	1.640,00	USD	1	PC	164.000,00	USD		1
<input type="checkbox"/>			Standard - USA /With	1.360,00	USD	1	PC	136.000,00	USD		1
<input type="button" value="Search"/> <input type="button" value="New"/>											

Figure 14: Condition Master Data: Pricing in Sales Order: SAP-System-Screenshot

2.2.3.2 Elucidation: Price Condition Information Record



ELUCIDATION

SAP provides several options for creating condition master data. Examples are

- **Material-specific price conditions:** A material is assigned a price either directly in the material master (sales view) or in the condition maintenance (transaction VK11 or App *Create Condition*), which is then valid for any customer. Scales can be defined, e.g., for quantity-based discounts.
- **Material-customer-specific price condition:** A price is defined for the combination of a material and a specific customer or customer group (transactions VK11 or App *Create Condition*). The price is then valid for the specific customer when the material is ordered. Scales can be defined, e.g., for quantity-based discounts.
It is also possible to define **price lists** for the combination of a customer and multiple materials in transaction V_NL or corresponding Fiori UX App.
- **Discounts:** Discounts can be defined that allow price determination depending on the customer and the material pricing group, etc.

Pricing conditions are always maintained on the level of **distribution chains** (combination of sales organization and distribution channel). That is, if you define a price for, e.g. the distribution chain UW00-WH, then this price is **not** valid for the distribution chains UW00-IN or UE00-WH. The **sales area** is determined from by retrieving the division from the material master and adding it to the Distribution chain (e.g., UW00-WH-BI).

If a **material-customer-specific price condition** exists for the combination of a material and a customer, it is always preferred over a general **material-specific price conditions** in the pricing determination procedure of sales documents (inquiry, quotation, sales order, outbound delivery, or billing documents).

The following figure illustrates a **material-specific** and customer independent price condition (\$2500 per unit) that was created in the App *Create Condition*. At the lower part of the screen a scale is maintained, determining that as of 500 units, the unit price decreases to \$2300.

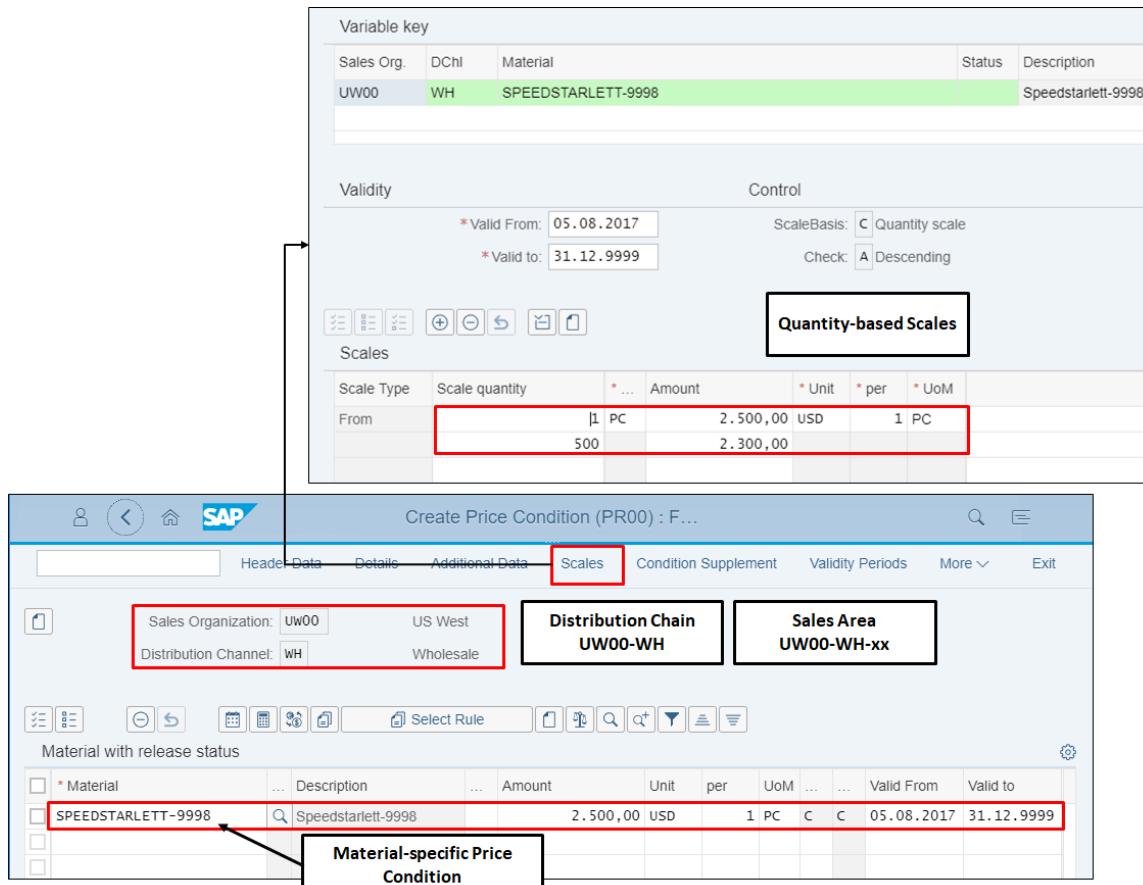


Figure 15: Material-specific Price Condition: SAP-System-Screenshot

The following figure illustrates a **material-customer-specific** price condition (\$2400 per unit) that was created in the App *Create Condition*. The price entered here, is only valid for this specific customer (customer ID 25010). At the lower part of the screen, again, a scale is maintained, determining that as of 500 units, the unit price decreases to \$2200.

Additional data that can be specified in the **customer-material information record** are:

- A link from the company's material number to a material number of the customer and to the material description of the customer.
- Specific shipping information for a particular customer and material (e.g., tolerances, information whether customer accepts partial deliveries, or the default delivery plant).

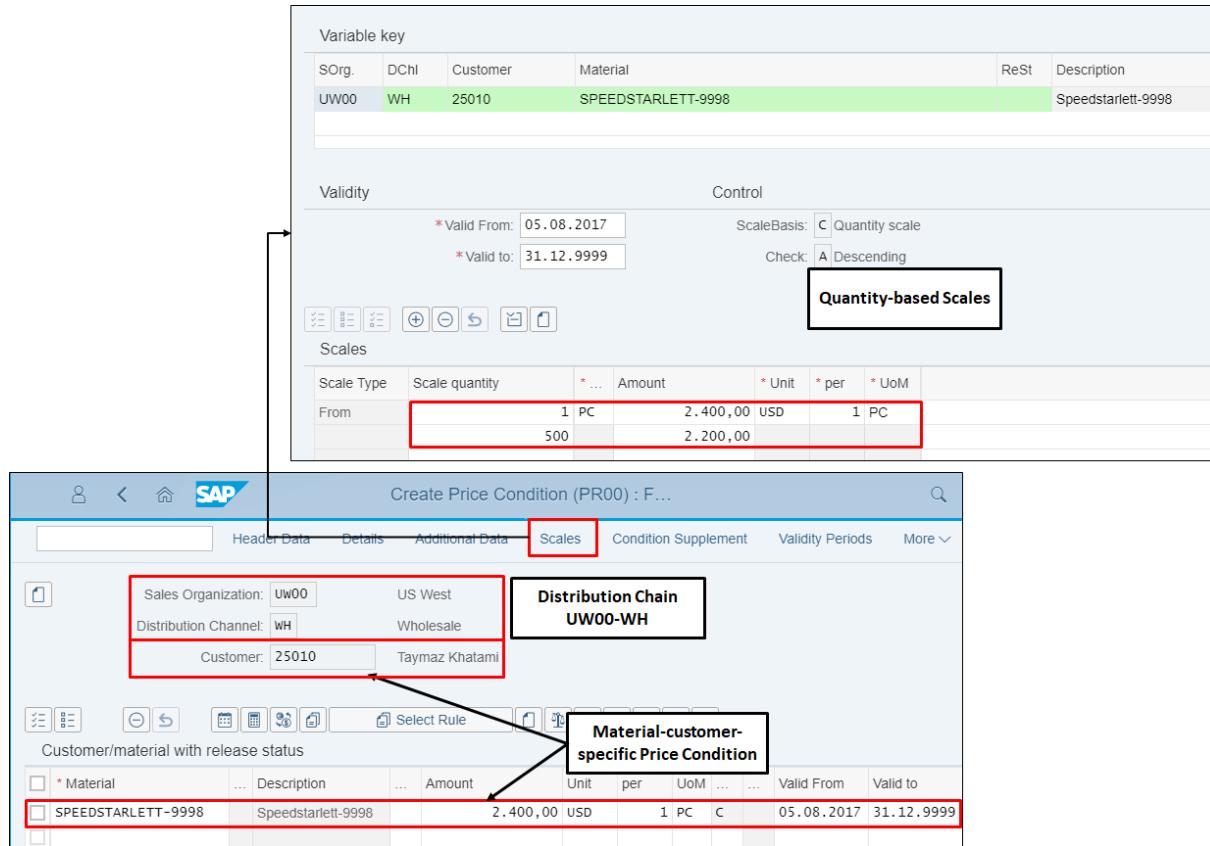


Figure 16: Material-Customer-specific Price Condition: SAP-System-Screenshot

2.2.4 Master Data in Sales Transactions

The following figure illustrates how master data is used in a business process. When a sales document (e.g., inquiry, quotation, sales order) is created in the SAP system a magnitude of information is retrieved from organizational data and master data records that have been stored in the database. This includes:

- Sales area
- Customer master data
- Condition master data
- Output data

The central master data record that you enter in a sales document is ***the customer ID*** of the customer that wants to order materials from your company. Once the customer ID is entered the sales areas for which the customer was created is retrieved from the customer master data and the sales document is assigned to this ***sales area***. If the customer has data segments created for multiple sales areas, the system will ask which sales area the sales document should be assigned to. Consider that from an organizational level aspect, the sales area is the central organizational unit for sales documents and that after creation of the sales document, the sales area assignment cannot be changed anymore. The sales area is used to determine pricing conditions, the controlling area to which costs of an order are settled, the company code and operation concern to which revenues are posted, etc. All these organizational units are retrieved from the assignment of the sales area (sales organization) to the organizational model (e.g. sales organization is assigned to exactly one company code, company code is assigned to exactly one controlling area, etc.).

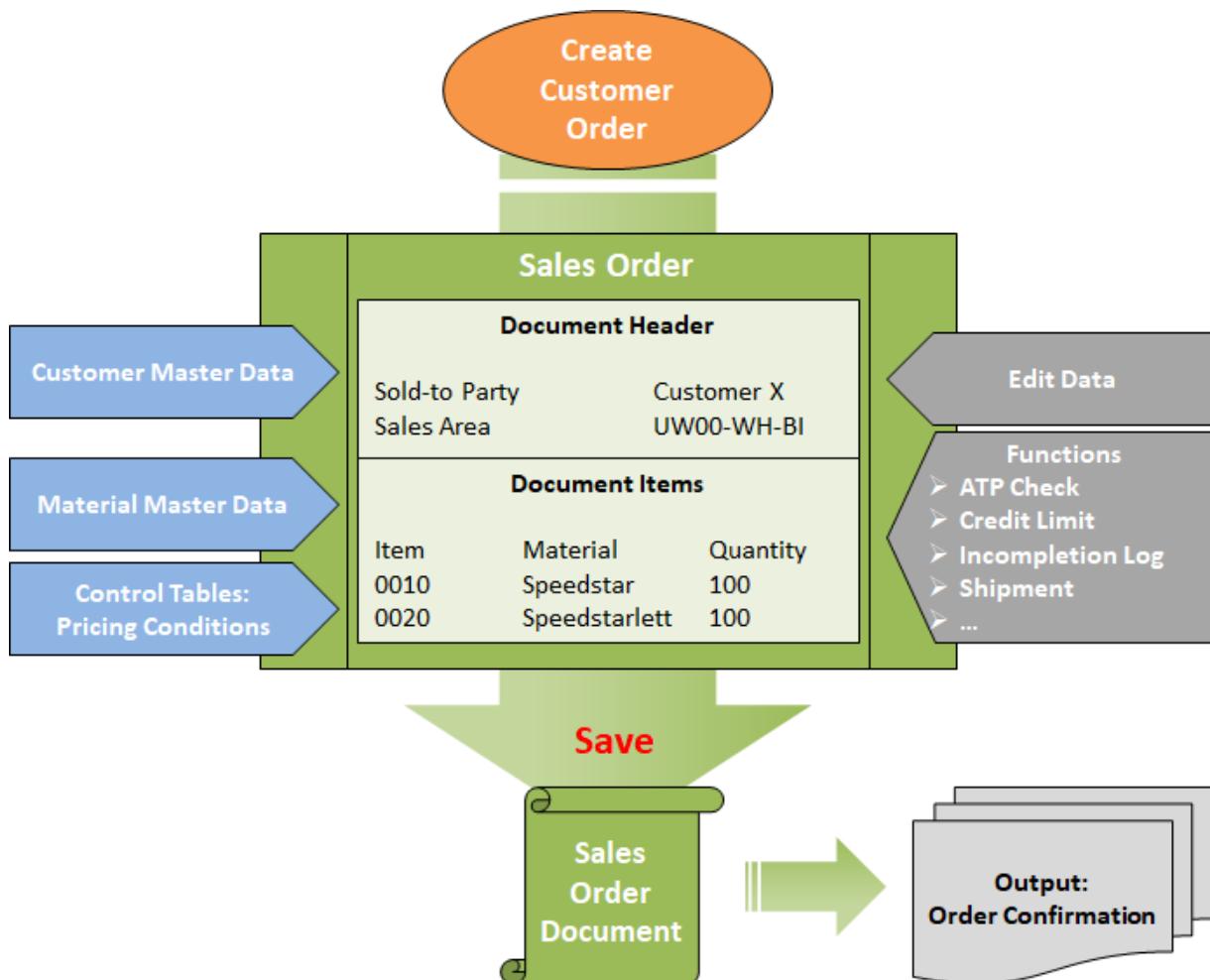


Figure 17: SD Master Data in Sales Transactions: SAP-System-Screenshot

The next master data record involved in the sales document is the material(s) the customer wants to order. Once you have entered the material master record, a series of further information is retrieved from the database. This includes, among others, delivery plant, unit of measure, weight, volume, as well as pricing conditions. For instance, if a ***customer-material-specific pricing condition*** or ***customer-specific discounts*** exist, the system will automatically propose the price from this master record. **Control tables** that are created and maintained in customizing (see also condition tables and access sequences in price determination procedures) determine the default values to be entered in the pricing fields for a sales document.

Furthermore, the ***output master data*** defined for the specific sales transaction is available, if information (e.g., Printout of an offer or an order confirmation) is to be sent to the customer via different media types such as mail, EDI, or fax.

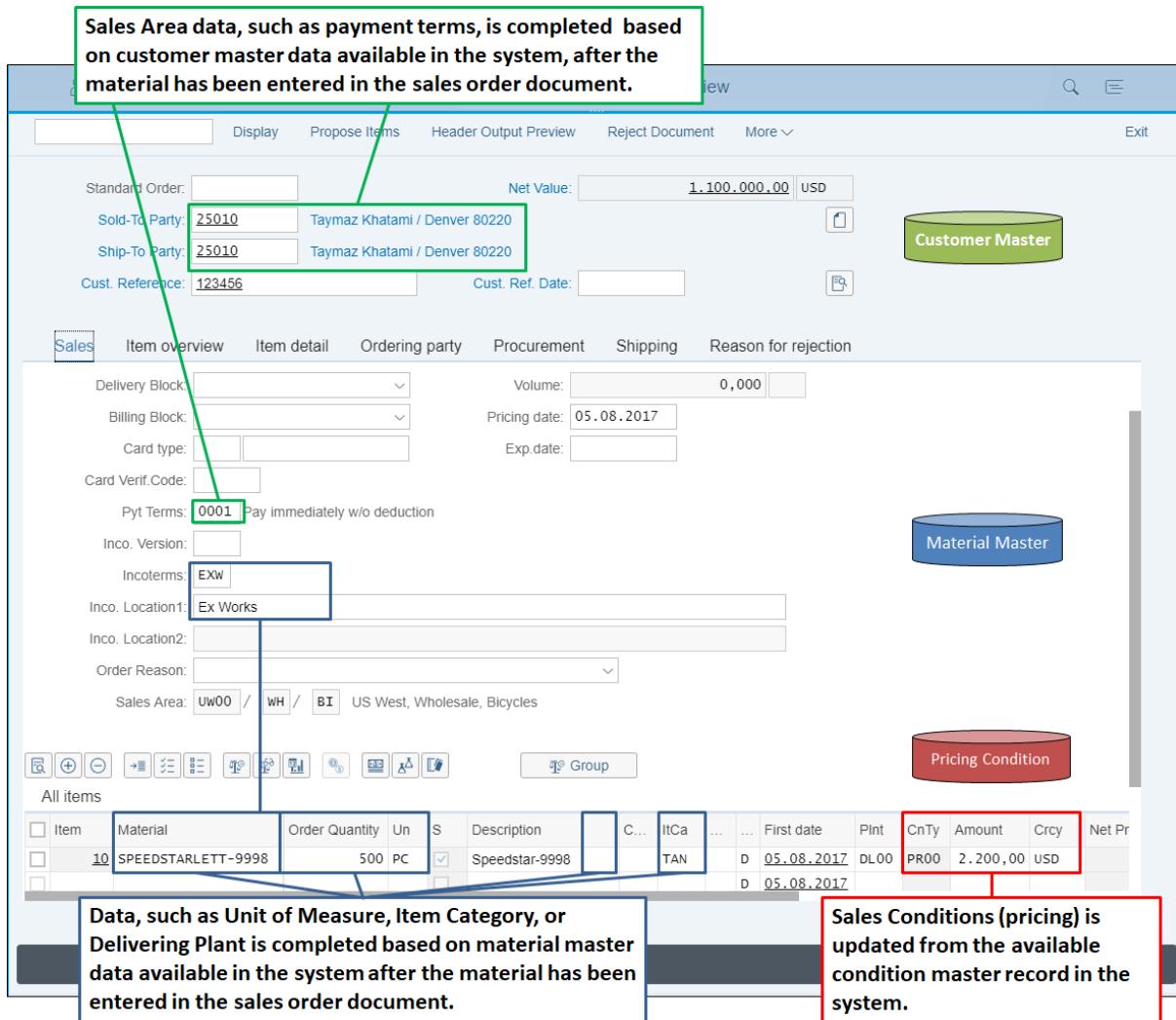


Figure 18: SD Master Data in Use: SAP-System-Screenshot

2.3 Practice: Master Data for Lead-to-Cash Business Process



PRACTICE

A new customer orders a product from your company. The customer is interested in 500 units of the Speedstarlett.

Sales orders contain customer data, product data and delivery schedule data. These data are then used by customer service employees, to inform customers about prices and delivery dates prior to order confirmation. Additionally, they answer customer queries using these data.

After receiving the order, the products are picked (all variances from the order quantity are recorded) and the delivery documents are printed out. When the delivery is released (goods are taken out of stock) to the customer, the stock quantities need to be reduced and the general ledger needs to be updated. After shipping goods to the customer, an invoice needs to be created. The accounting department checks unpaid customer items periodically and payment receipts for customers that have paid are posted.

You, being a member of the project team, need to understand the sales order management cycle and the most important sales and distribution functions in this cycle.

You will now enter the new customer and maintain conditions for your products in the system.

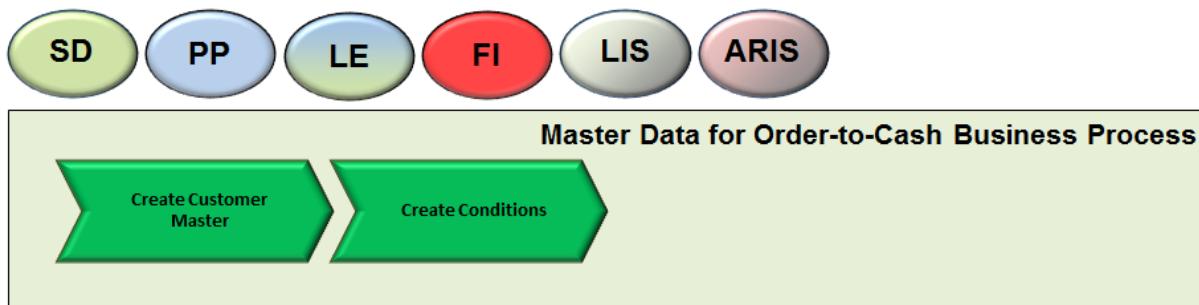


Figure 19: Process Overview: Master Data for Lead-to-Cash Business Process

2.3.1 Create Customer Master

Start with the **customer master record**.

The FI and SD functional areas use customer master data in the ERP system:

- **SD**: pricing group, delivery priority, ship-to-party, etc.
- **FI**: account processing, cash discount period, dunning procedures, etc.

The customer master is separated in three different views for these diverse purposes. In actual business processes, the respective departments maintain the various views.

Definition: Customer

A customer is a business partner of your company for whom receivables are present for an occurred delivery or a transferred right.



In the S/4HANA system vendors and customers are created as business partners, first. Then, they are declared as vendors and/or customers by assigning business partner roles.

NOTE

In script 1 – Purchase-to-Pay, you already have created a business partner with vendor-specific data. Now, you will create a business partner with customer-specific data.

2.3.1.1 Create Customer

Therefore, create a business partner, first, and then, assign customer-specific data. Regarding Company Code and Sales Organization.

To create a customer master record, scroll down to the tile group **Script 3- Lead-to-Cash** and open the app **Maintain Business Partner**.

1. In the *Maintain Business Partner* view, click on **Person** button and make sure, that within **Create in BP role** field the entry **Business Partner (Gen.)** is available.
2. Within the **Address** tab, enter the following data:

- First name	<i>your first name</i>
- Last name	<i>your last name</i>
- Search Term	<i>Customer-xyyy</i>
- Postal Code	<i>80220</i>
- City	<i>Denver</i>
- Country	<i>US (USA)</i>
- Time zone	<i>CST (if necessary, click on  within Street Address area)</i>
- Transportation zone	<i>0000000002</i>
- Confirm with Enter and save .	
3. The system provides a number regarding **Business Partner**. Write down this number in your data sheet, but do not leave the current view.



Consider, that your own business partner number will differ from the following figure. Also consider, that while further processing you only are allowed to use your own data.

NOTE

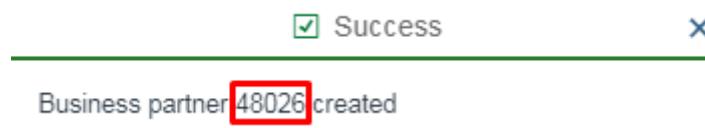


Figure 20: Create Customer (1): SAP-System-Screenshot

Business Partner:

4. Maintain the customer-specific data. Therefore, select **Switch Between Display and Change** to get into the editing mode.
5. From the **Change in BP role** dropdown menu, select the entry **FI Customer**. Now, you can maintain company code specific data.

6. Start with entering **EN** as **Correspondence language**.
7. Then, click on the **Company Code** button in the upper area (if your browser is not executed in full screen mode, you probably have to select **More →**, first).

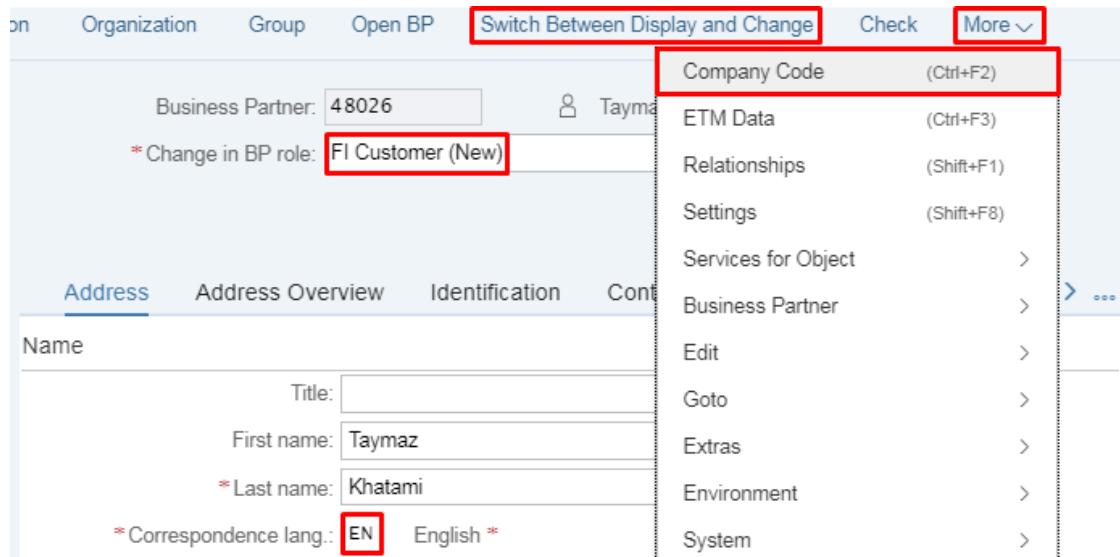


Figure 21: Create Customer (2): SAP-System-Screenshot

8. Enter **US00** as **Company Code** and confirm with **Enter**.
9. Next, enter **110000** as **Reconciliation account** and confirm with **Enter**.

Figure 22: Create Customer (3): SAP-System-Screenshot

10. **Save**. Within the **Company Code** area, in the **Customer** field the customer number is generated. Write down the customer number on your data sheet.

Company Code

Company Code:	US00	Global Bike Inc.	<input type="button" value="Company Codes"/>
Customer:	25015		<input type="button" value="Switch Company Code"/>
Vendor:			

Customer: Account Management Customer: Payment Transactions Customer: Correspondence Customer: Sales and Distribution

Account Management

* Reconciliation acct: 110000

Figure 23: Create Customer (4): SAP-System-Screenshot

Customer Number:

11. Now, maintain the information for sales area. Therefore, select **Customer** from the **Change in BP role** dropdown menu.
12. Select **Sales and Distribution** (or **More → Sales and Distribution**, in case you are not in the full screen mode).

Organization Group Open BP Switch Between Display and Change Check More ▾

Business Partner: 48026 Taymaz

* Change in BP role: Customer (New)

Sales and Distribution (Ctrl+F2)

- ETM Data (Ctrl+F3)
- Relationships (Shift+F1)
- Settings (Shift+F8)
- Services for Object >
- Business Partner >
- Edit >
- Goto >
- Extras >
- Environment >
- System > ...

Name

Title:

First name: Taymaz

* Last name: Khatami

* Correspondence lang.: EN English *

Figure 24: Create Customer (5): SAP-System-Screenshot

13. Within the **Sales Area** area, enter the following data:

- Sales Organization	UW00
- Distribution Channel	WH
- Division	BI
- Confirm with Enter .	
14. Within the **Orders** tab, enter the following data:

- Sales District	000002
- Order Probability	100
- Currency (scroll down)	USD
- Price Group	01
- Cust.Pric.Procedure	1 (Standard)

- Confirm with **Enter**.
15. Switch to the **Shipping** tab and enter the following data:
- **Delivering Plant** **DL00**
 - **Shipping Conditions** **01 (Standard)**
 - Confirm with **Enter**.
16. Within the **Billing** tab, make the following settings:
- **Incoterms** **EXW**
 - **Inco.Location1** **Ex Works**
 - **Payment terms (scroll down)** **0001 (Payable immediately Due net)**
 - **Tax classification** **I (taxable) → in each row!**
 - Confirm with **Enter** and **save** your data. Close the tab.

Cou...	Name	Tax categ...	Name	Tax ...	Description
US	USA	UTX1	Tax Jurisdict.Code	1	Taxable
US	USA	UTX2	County Sales Tax	1	Taxable
US	USA	UTX3	City Sales Tax	1	Taxable

Figure 25: Create Customer (6): SAP-System-Screenshot

2.3.1.2 Extend Customer Master Record

Extend your customer master record so that you can use it in sales area **UW00/IN/BI** as well. Use the data from sales area UW00/WH/ BI as reference. Therefore, scroll down to the tile group **Script 3- Lead-to-Cash** and open the app **Maintain Business Partner**.

1. First, open your created business partner record by entering the **number of your business partner** you have just created (that is you have to enter your business partner number and not your customer number) into the **Business Partner** field. Confirm with **Enter**.
2. From the **Display in BP role** dropdown menu, select **Customer** and then, click on **Sales and Distribution** (or **Sales and Distribution**).

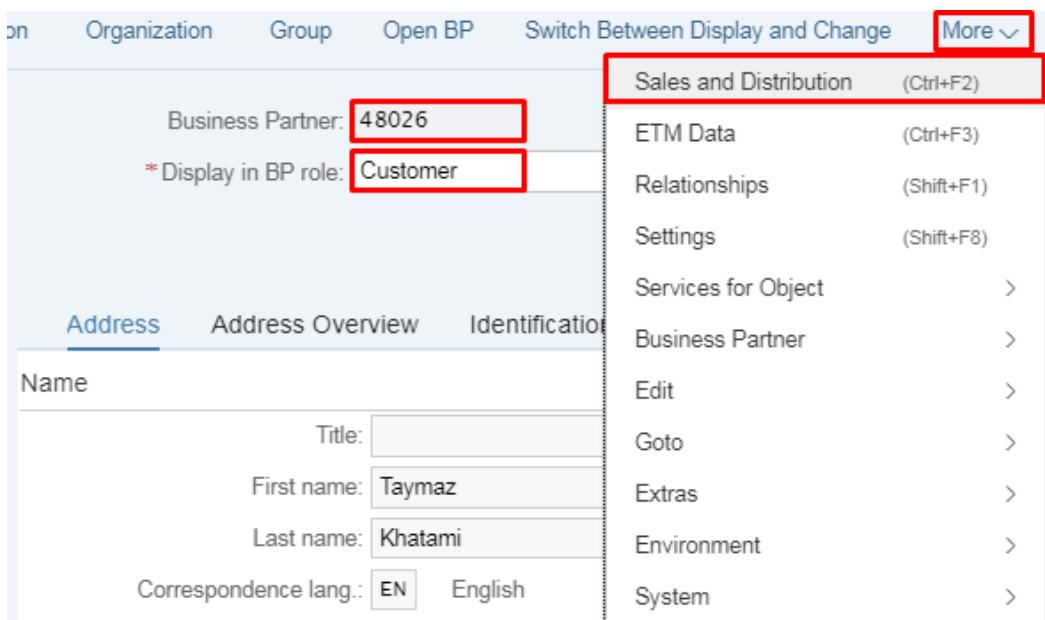


Figure 26: Extend Customer Master Data (1): SAP-System-Screenshot

3. Select **Switch Between Display and Change** to switch to the editing mode and then, select **Sales Areas** to create a new Sales Area.
 4. Press the **Create** button and then, enter the following data (if necessary, increase the column width):
 - **Sales Organization** *UW00*
 - **Distribution Channel** *IN (!)*
 - **Division** *BI*
 5. Confirm with **Enter**.
 6. Select the row, you have just created and then, click on **Transfer**.

Figure 27: Extend Customer Master Data (1): SAP-System-Screenshot

7. Now, you can maintain the data regarding the new Sales Area. Maintain the data on your own:

Orders tab:

- Sales District	000002
- Order Probability	100
- Currency (scroll down)	USD
- Price Group	01
- Cust.Pric.Procedure	1 (Standard)
- Cust. Stats. Grp.	1 ('A' Material)

Shipping tab:

- Delivering Plant	DL00
- Shipping Conditions	01 (Standard)

Billing tab:

- Incoterms	EXW
- Inco.Location1	Ex Works
- Payment terms (scroll down)	0001 (Payable immediately Due net)
- Tax classification	1 (taxable) → in each row!
- Confirm with Enter and save your data. Close the tab.	

2.3.1.3 Display Customer Master Record

Display the created customer master record and answer the following questions. Therefore, scroll down to the tile group **Script 3- Lead-to-Cash** and open the app **Maintain Business Partner**.

1. First, open your created business partner record by entering the **number of your business partner** you have just created into the **Business Partner** field. Confirm with **Enter**.
2. From the **Display in BP** role dropdown menu, select **Customer** and then, click on **Sales and Distribution** (or **More → Sales and Distribution**).
3. Press the **Sales Areas** button and within the popup, select the row containing **Distribution Channel IN**. Then, click on **Transfer**.

Sal...	Sales Organization	Distr. Chl	DistrChannel	...	Divis.
<input type="radio"/>	uw00	US West	WH	Wholesale	BI Bicycles
<input checked="" type="radio"/>	uw00	US West	IN	Internet	BI Bicycles
<input type="radio"/>					

Figure 28: Display customer master record: SAP-System-Screenshot

Answer the following questions. List the answers on your data sheet.

4. Select the **Orders** tab. What is the definition of **Customer Group**? How did you get this information?
5. Select the **Billing** tab. What is the purpose of **Payment terms**?
6. From the **Display in BP role** dropdown menu, select the **FI Customer** and then, **Company Code or More → Company Code**.
7. Select the **Customer: Account Management** tab. What is the purpose of the **Reconciliation Account**?

Leave the transaction by pressing **Exit**.

2.3.2 Create Conditions

Your finished products Speedstar and Speedstarlett do not feature a sales price as you could see in the Plan-to-Produce unit (you were required to manually enter a sales price of 3000 USD resp. 2500 USD). Since there will be an order for the Speedstarlett in this case study, maintain the sales conditions for the Speedstarlett.

Definition: Sales Condition

A sales condition is an agreement regarding prices, surcharges/discounts, taxes and so on that is valid within a defined period of time depending on selected factors such as customer group, customer and material type.

2.3.2.1 Create Product-specific Condition Record

The condition PR00 (price) is mandatory and must, therefore, be maintained. It can be created for each sales organization and distribution channel. If not done yet, set the division in the material master to BI (bicycle). Therefore, scroll down to the tile group **Script 3- Lead-to-Cash** and open the app **Change Material**.

1. Enter your material **Speedstarlett-xyyy** and confirm with **Enter**.
2. Select the **Sales: Sales Org. Data 1** view. Confirm with **Enter**.
3. Enter plant **DL00**, sales organization **UW00** and distribution channel **WH** and confirm with **Enter**.
4. If the division is not set yet, enter **BI** in the specific field.
5. Click the -button.
6. Define the following for the **Speedstarlett**: from **the current date** to **31.12.9999**, and from a sales quantity of one, a price of 2500 USD is applicable. From a sales quantity of 500, a sales price of 2300 USD per unit is applicable.
 - Enter **1** in the first line of the **Scale quantity** column and **2500** in the **Amount** column.
 - In the second row, enter the scale quantity **500** and an amount of **2300**.
 - Choose **Enter** and **save** the modification.
 - Leave the view by pressing **Exit**.

Basic data 1 Basic data 2 Sales: sales org. 1 Sales: sales org. 2 Sales: General/Plant Fore

Material: SPEEDSTARLETT-9995
* Descr.: Speedstarlett-9995
Sales Org.: UW00 US West
Distr. Chl: WH Wholesale

General data

* Base Unit of Measure: EA each Division: BI Bicycles
Sales unit: Sales unit not var.:
Unit of Measure Grp:
X-distr.chain status:
DChain-spec. status:
Delivering Plant: DL00 Plant Dallas
Material Group:
Cash Discount:

Variable key

Sales Org.	DChl	Material	Status	Description
UW00	WH	SPEEDSTARLETT-9995	Released	

Validity Control

* Valid From: 20.10.2017 Scale Basis: C Quantity scale
* Valid to: 31.12.9999 Check: A Descending

Scales

Scale Type	Scale quantity	* ...	Amount	* Unit	* per	* UoM
From	1 EA		2.500,00	USD	1	EA
	500		2.300,00			

With this, you set a **MATERIAL-specific** price. That is, this material is sold to ANY customer at this price and scaling. The mandatory pricing condition in a SAP S/4HANA system is **PR00**.

Figure 29: Create Material-specific Condition Record: SAP-System-Screenshot

You maintained the sales price with the respective fixed-scale quantities for the Speedstarlett with the condition type **PR00** (price condition). This condition record is applicable to all Speedstarletts with the distribution channel WH (whole sale), sales organization UW00 and company code US00.

When creating a new sales order and you choose, for example, distribution channel IN, this condition is not valid, since you did not maintain it for Sales area UW00/IN/ BI. In that case, you would be prompted to enter a sales price as in the Plan-to-Produce teaching unit. Thus, it is ensured that this condition is only applicable to distribution channel WH (Sales area UW00/WH/BI).

2.3.2.2 Create Customer-specific Condition Record

Your new customer negotiated special conditions with the SD department. They agreed on a price per unit of only 2400 USD and from a sales quantity of 500 units, on a sales price of 2200 USD per unit. Maintain the customer-specific condition.

Scroll down to the tile group **Script 3- Lead-to-Cash** and open the app **Create Conditions**.

1. In the *Create Conditions* view, enter **PR00** as **Condition type** and confirm with **Enter**.
 2. Within the **Key Combination** popup, select the entry **Customer/material with release status** and confirm with **Choose**.

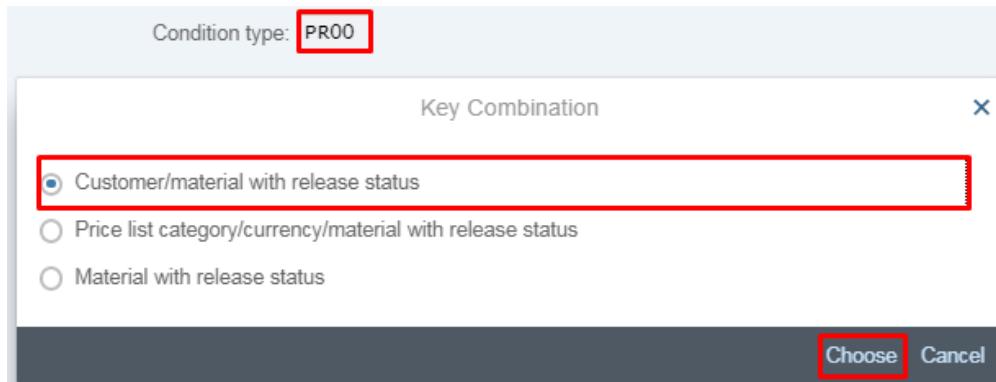


Figure 30: Create Condition Records (1): SAP-System-Screenshot

3. Enter **US West (UW00)** as Sales Organization, **Wholesale (WH)** as Distribution Channel and **your new Customer (your customer number)** into the respective field. Confirm with **Enter**.
 4. Now, enter the following data:

- Material	<i>Speedstarlett-xyyy</i>
- Amount	<i>2400</i>
- Unit	<i>USD</i>
- per	<i>1</i>
- Unit of Measure (UoM)	<i>EA</i>
- Valid From	<i>the current date</i>
- Valid to	<i>31.12.9999</i>
- Confirm with <i>Enter</i> .	
 5. Then, select the row and click on **Scales**.

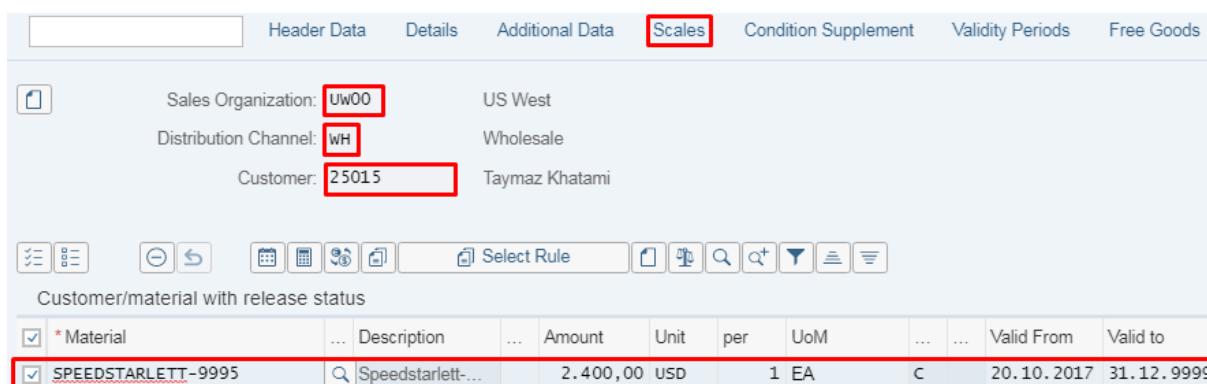


Figure 31: Create Condition Records (2): SAP-System-Screenshot

6. Arrange the condition so that the **price** is **2400** USD from a **Scales quantity** of **one** unit and from a **scales quantity** of **500**, the **price** is **2200** USD.

Variable key			
SOrg.	DChl	Customer	Material
UW00	WH	25015	SPEEDSTARLETT-9995

Validity		Control	
*Valid From: <input type="text" value="20.10.2017"/> *Valid to: <input type="text" value="31.12.9999"/>		Scale Basis: <input checked="" type="checkbox"/> C Quantity scale Check: <input checked="" type="checkbox"/> A Descending	

Scales							
Scale Type	Scale quantity	* ...	Amount	* Unit	* per	* UoM	
From	<input type="text"/> <input type="text" value="500"/>	1 EA	2.400,00	USD	1	EA	
			2.200,00				

Figure 32: Create Condition Records (3): SAP-System-Screenshot

7. *Save* your entries and press *Exit*.

With this, you have accomplished the maintenance of all relevant master data (customer master record, conditions) from an SD point of view.

You have created a customer who is valid for

- Company Code US00
- Sales Area UW00/WH/BI
- Sales Area UW00/IN/BI

You have created two condition records for the Speedstarlett:

- **PRODUCT**-specific sales price (PR00) valid for Sales Area UW00/WH/BI and **ANY** customer
- **CUSTOMER**-specific sales price (PR00) valid for Sales Area UW00/WH/BI and **YOUR** customer.

Next, take a look at the SD process (Lead-to-Cash process).

3 Lead-to-Cash Business Process

In this unit we will discuss the Lead-to-Cash business process in detail.

3.1 Theory: Lead-to-Cash Business Process



THEORY

In this theory chapter, you will become acquainted with the Lead-to-Cash business process and the objects involved in the individual steps of the process. Since the Lead-to-Cash business process, like almost any other process in the SAP system, is integrated with different SAP applications, we will also point out some integration aspects in this chapter.

3.1.1 Overview of the Lead-to-Cash Business Process

The following figure displays the standard **Lead-to-Cash** business process. The process and its individual steps may vary significantly between different companies depending on the company procedures, the products or services that are sold and other factors. SAP provides all tools and customizing settings to tailor this process to the business needs.

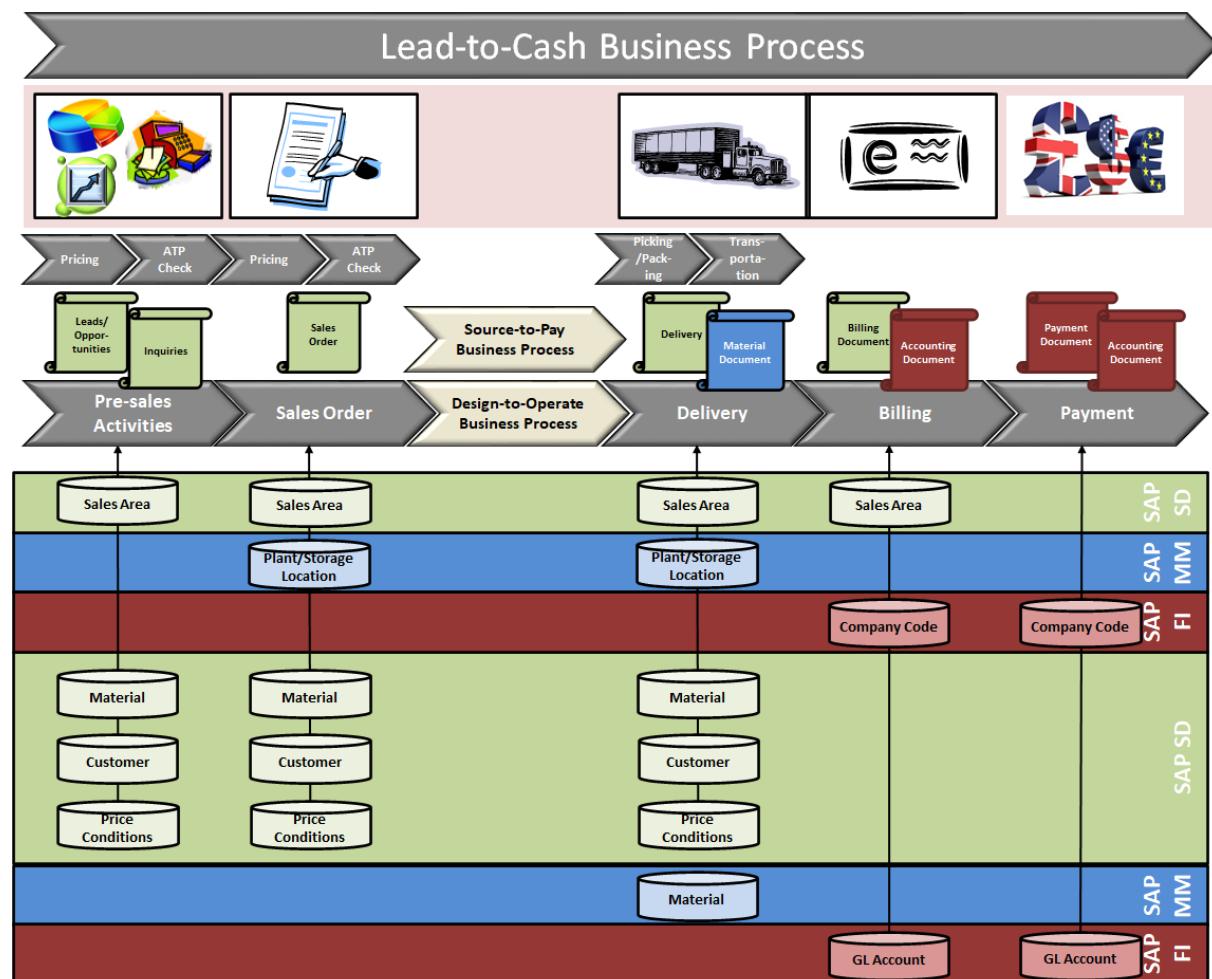


Figure 33: Lead-to-Cash Business Process

To be able to process sales orders effectively, it is necessary that all activities that fulfill customer requirements are integrated in a series of processes. The SAP application Sales and Distribution (SAP SD) allows for an integrated approach to sales order management that affects

multiple applications and functions of the SAP system. The Lead-to-Cash business process consists of several steps, with each step being represented by documents in the SAP system:

1. **Pre-sales Activities:** The Lead-to-Cash business process can be initiated by pre-sales activities that involve marketing efforts of the company to set up and maintain customer relationships. This step, which ideally is carried out in the **SAP Sales Cloud (Customer Experience)** system, can include mail advertisement, campaigns and creating customer databases with customer contact data. Sales support allows identifying potential customers and generating new business deals (leads). These leads can then be transferred to opportunities. A sales methodology supports the sales force of the company with best practice activities to successfully close new business deals. Once opportunities mature, they can be transferred into customer inquiries, quotations, and sales orders.
2. **Sales Order Processing:** The central part of sales order processing is the creation of the sales documents. Inquiries, quotations, or sales orders are different examples of sales documents in the SAP system. These documents derive all data necessary for processing the customer's demand for a product from the appropriate master data in the system. If the customer accepts the quotation, the quotation document is transferred into a **sales order document**. A sales order, e.g., copies the customer data, product data, the pricing data, etc., from the preceding document (the quotation). All documents created with the whole process are linked to each other and facilitate the transfer of data. Within the sales order product availability checks (ATP) are performed.
3. **Purchase-to-Pay or Make-to-Order/Plan-to-Produce:** To provide a customer with the product ordered, it might be necessary to purchase materials or start production processes. As you already know, a sales order of the SAP SD application creates a customer requirement in Demand Management and Material Requirements Management. Thus, the Lead-to-Cash business process generally triggers and is integrated with the **Purchase-to-Pay** and **Make-to-Order/Plan-to-Produce** business processes.
4. **Delivery:** When a product is ready to be delivered to the customer, shipping of the good must be organized. Organization and processing of **outbound deliveries** is part of the **shipping process**. Therefore, the data (materials, quantities) from schedule lines of the sales order are copied to the *outbound delivery document*. The delivery document controls, supports, and monitors numerous subprocesses, such as creating transfer order, picking, packing, and goods issues. Once the shipping process is completed, the goods can be delivered, and the goods issue can be posted. With the goods issue posting a material document is created, which reduces the material quantity on stock, and an accounting document, which posts the material value to the balance sheet accounts in Financial Accounting.
5. **Billing:** The billing process regularly starts when the product that has been ordered by the customer has been delivered. In the billing component, a **billing document** is created with reference to the delivery or sales order document. Thereby, delivery items and order items (e.g., services) are copied into the billing document. The billing document depicts the SD document that functions as the basis for creating customer invoices. It also serves as a data source for Financial Accounting and allows monitoring and processing customer payments. When a billing document is created, the G/L accounts

are normally determined automatically, and the relevant accounting data is posted to those accounts in FI.

6. **Payment:** Part of **handling payments** is the check of open items and the posting of incoming payments. Posting incoming payments of a customer is part of the application Financial Accounting (SAP FI) and it is carried out, outside of the Sales and Distribution application (SAP SD). When the customer pays the invoice, the customer account is cleared.

Intelligent Enterprise: SAP S/4HANA and SAP Customer Experience

The above-described business process encompasses all the process steps that take place in the digital core of the system landscape: the SAP S/4HANA system. This digital core is the system of record, and handles all operational transactions for production planning, procurement, sales and distribution including Available-to-Promise (ATP) and connecting into the shop floor. However, with **SAP Customer Experience** and **SAP Analytics Cloud**, SAP offers solutions that extend the scope of the Lead-to-Cash business process and seamlessly integrate them with customers, sales channels, and powerful analysis tools.

SAP Customer Experience is SAP's new CRM solution, consisting of SAP Sales Cloud, SAP Marketing Cloud, SAP Commerce Cloud, and SAP Customer Data Cloud. It provides functionalities to cover all areas of Sales, Service, Marketing, and Analytics. It uses transaction, analytics, and experience data to create higher order success rates and to increase customer satisfaction. Key concepts of SAP Customer Experience are

- The customer at the center of all processes
- End-to-end process with a single data model
- Increase effectiveness with intelligent and integrated technologies

Central pre-sales activities accomplished in SAP Customer Experience encompass marketing efforts (market analyses, product presentations, advertising), identification of potential business opportunities (leads, opportunities), winning new customers and maintaining the customer life cycle. The information and documents generated in SAP Customer Experience are seamlessly integrated into the SAP S/4HANA core sales and service processes. A customer's interest to buy a company's product (SAP Customer Experience) connects the Lead-to-Cash business process to the company's realization of revenue (SAP S/4HANA), integrating the front office to the digital core in order to deliver consistent, end-to-end customer experiences.

Therefore, pre-sales documents created in SAP Customer Experience are passed to Sales and Distribution processing in SAP S/4HANA for customer order fulfillment and Billing. SAP Analytics Cloud (SAC) can be used to capture real-time KPIs for the entire process including information from both SAP Customer Experience and SAP S/4HANA giving the company a clear and measurable end-to-end customer Experience.

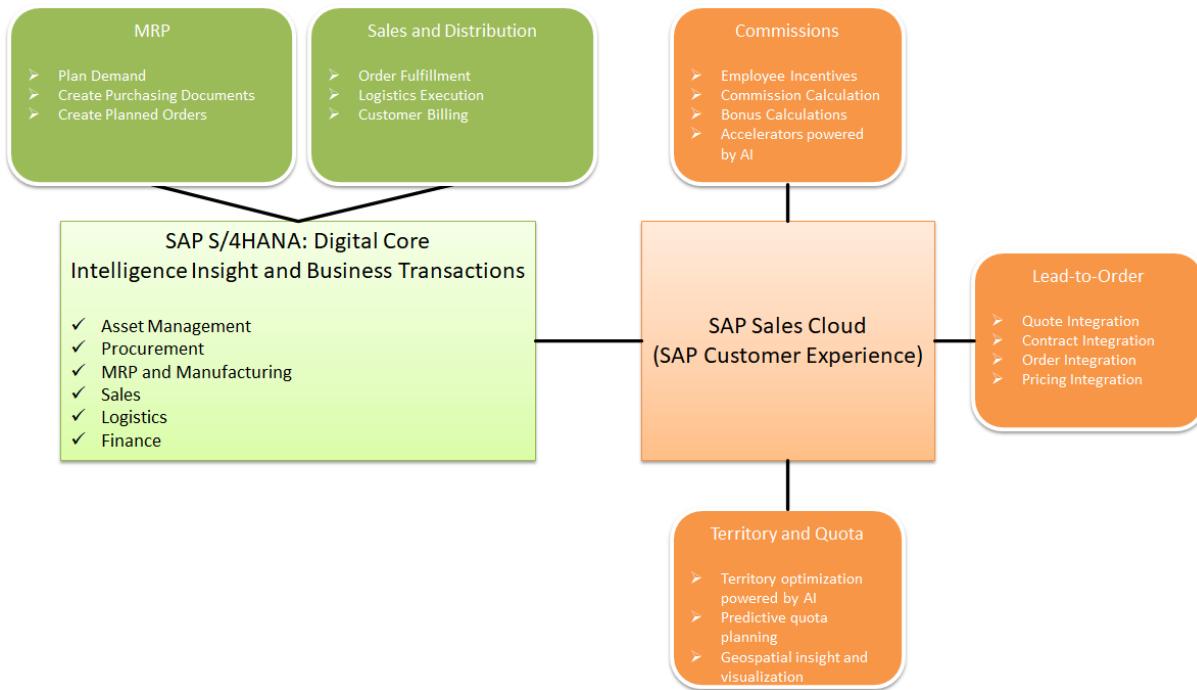


Figure 34: Intelligent Enterprise: SAP S/4HANA and SAP Customer Experience

The extended Lead-to-Cash business process can be split into the following five distinct phases, with each phase being named based on the step it is coming from and the step it is going to:

1. **Contact-to-Lead:** The task of marketing employees is to generate leads for sales (e.g., for a new product or range of products). Therefore, they could create marketing campaigns aiming at new customers or focusing on existing loyal customers. The goal is to stimulate customer interest to generate sufficient customer engagement and interaction. SAP Customer Experience helps capturing and scoring this interaction throughout the process and to create a marketing lead (interest of a customer in buying a product).
2. **Lead-to-Opportunity:** The lead is then presented to sales representatives or account managers that assess whether to pursue or drop the lead. Analytics tools or renewed direct contact with the potential customer may contribute to the decision. If the lead is promising, it is converted to an opportunity.
3. **Opportunity-to-Quote:** The sales representative then assesses whether the opportunity is ready for a formal quote, or not. In a self-service scenario, the customer may even themselves request a quotation online.
4. **Quote-to-Order:** The quotation is created with the appropriate mix of products, is priced and presented to the customer directly on the website, via email or printed output. The quote may be reworked following customer feedback. Once the customer agrees, a sales order is created from the quotation.

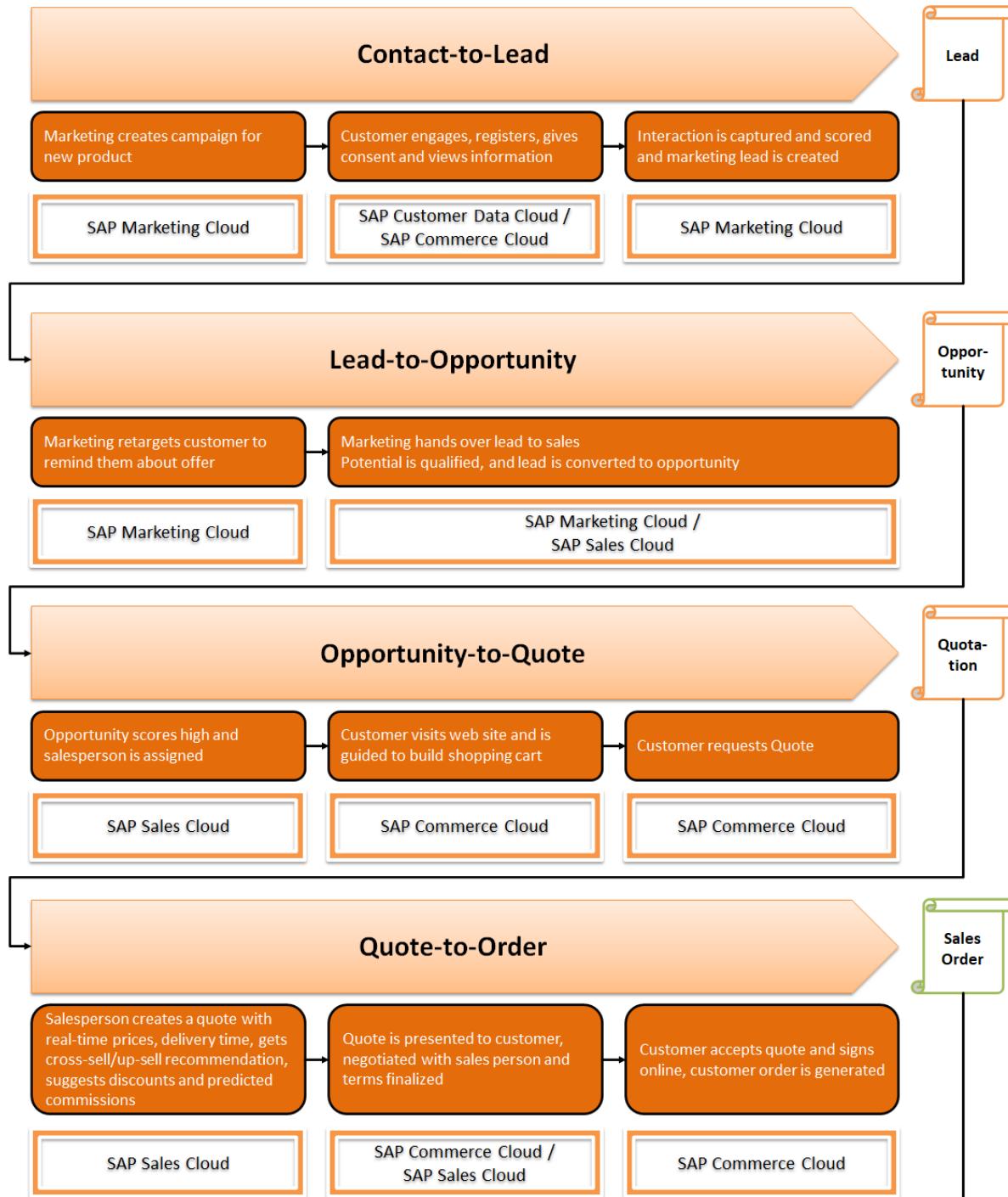
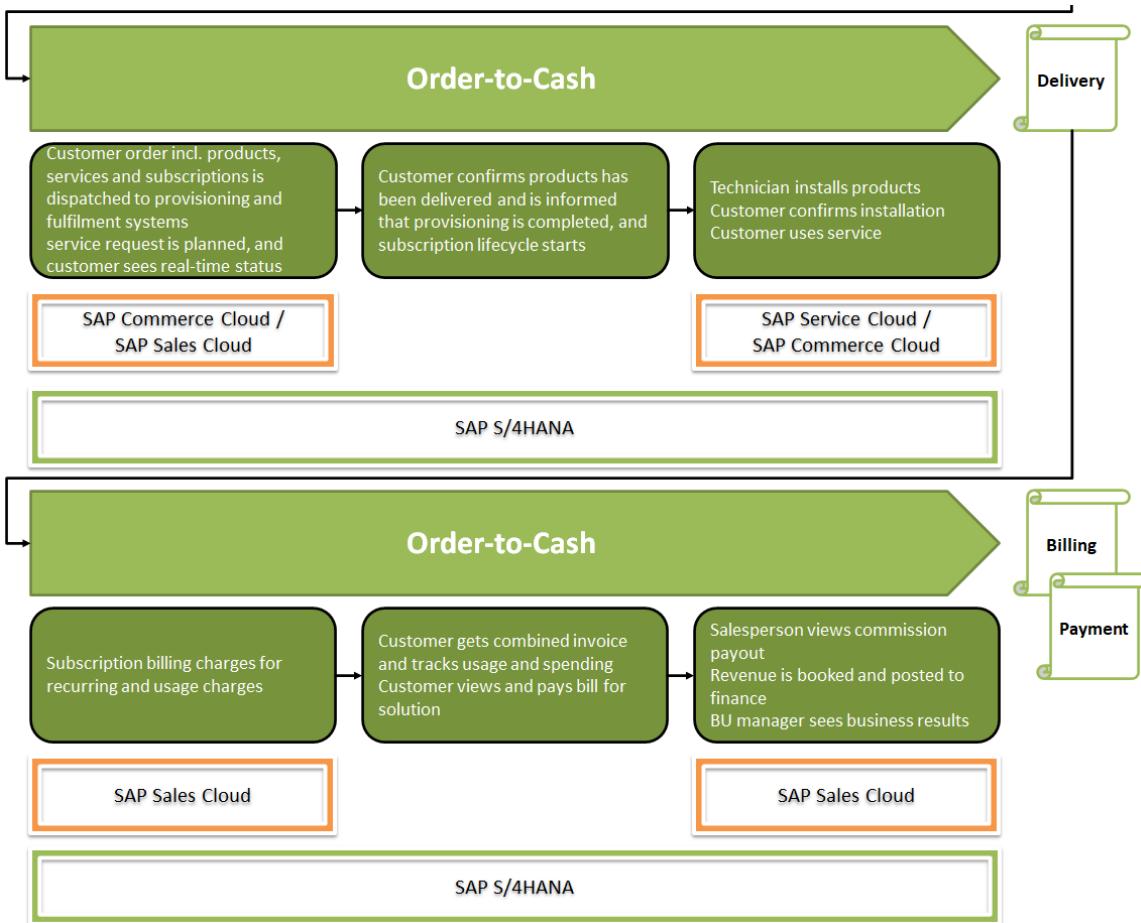


Figure 35: Extended Lead-to-Cash Business Process (1) (blogs.sap.com)

5. **Order-to-Cash:** After physical products were dispatched and delivered or service products have been scheduled and performed, the customer may confirm product and service receipt as completed. Eventually, the customer is billed.

Figure 36: Extended Lead-to-Cash Business Process (2) (blogs.sap.com)

3.1.2 Sales Order Processing

Successful pre-sales activities, in general, lead to new business deals. A new business deal in the SAP system is documented by creating a **sales order document**.

3.1.2.1 Creating a Sales Order

A **sales order** is an electronic document and contains all information for sales order processing in sales order management. It depicts a contractual agreement between a company and its customer and contains the products or services that the company will deliver for agreed prices, quantities, and times. A sales order can contain multiple different (material positions) items that can be entered in a single screen transaction (transaction VA01 or Fiori App *Create Sales Order*). A sales order is always created on the organizational level of a specific **sales area**.

A sales order should contain the following basic information:

- Customer master data: customer ID, address, contact data
- Material and/or service and the requested quantities
- Pricing (conditions)
- Specific delivery dates and quantities
- Shipping information
- Billing Information

Some of these fields are defined as mandatory (e.g., customer ID), which must be filled in order to be able to further process the sales order.

A sales order can be created in different ways:

- A sales order can be created manually without any link to preceding documents
- A sales order can be created with reference to a variety of documents and activities:
 - o Customer contact for order (pre-sales activity): phone, internet, email
 - o Existing Contract
 - o Inquiries
 - o Quotations
- A sales order can be transferred from other non-SAP systems via EDI (Electronic Data Exchange)
- A sales order can be created via the Internet applications.
- A sales order can be transferred from other SAP systems (e.g. SAP CRM) via RFC connection (Remote Function Call)

When creating a sales order **manually** without any reference to preceding sales documents, you must enter customer, materials and other order-relevant data such as quantities into the sales order document. The system then retrieves all relevant and available data (e.g. addresses, prices, weights, volumes, unit of measures, delivery plant) from the master data records and control tables. We have discussed this already in the master data chapter of this teaching unit.

When creating a sales order **with reference to a preceding document** (e.g. quotation), relevant data such as customer ID, material, quantities, pricing conditions, etc. are copied from the preceding document into the sales order. Furthermore, a link between the sales order and the preceding document is established in a so called *document flow*.

In both cases data entering process is facilitated, since customer-specific data from the customer master record or price information from previously stored conditions or data from preceding documents is transferred into the sales order and does not need to be re-entered. Additionally, input errors are avoided.

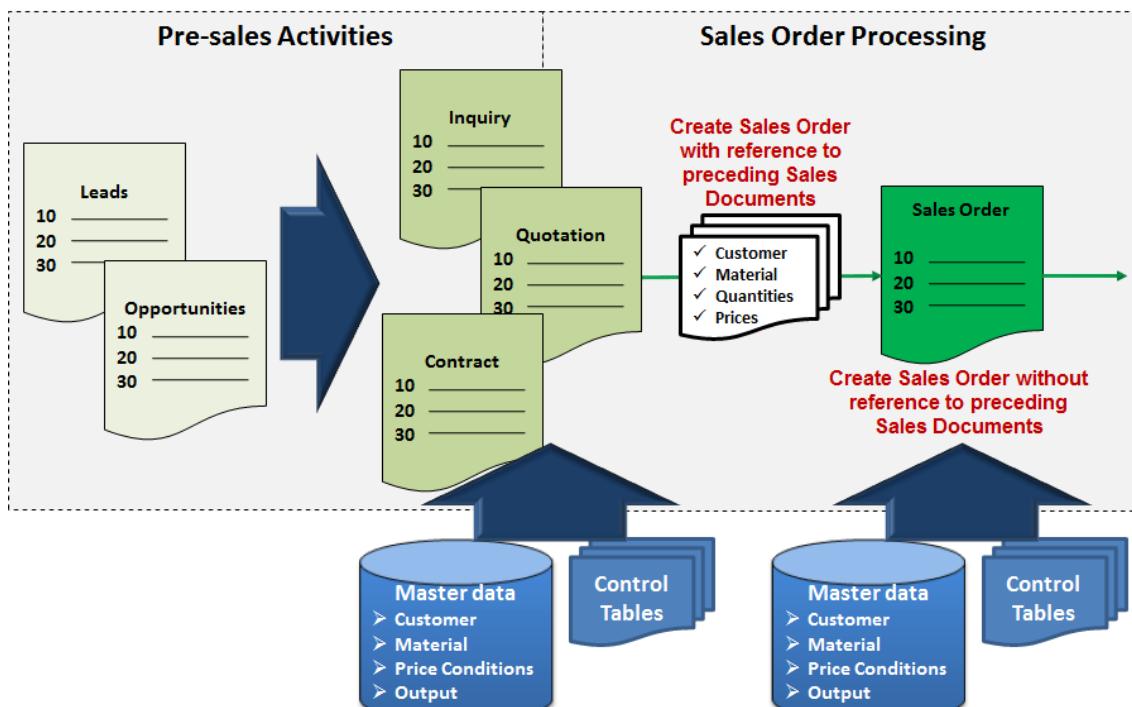


Figure 37: Sales Order Creation

3.1.2.2 Sales Order Document Structure

A sales document consists of three levels: header, item and schedule line. Data is distributed on these levels as follows:

- **Header:** Data in the header of a sales document are applicable to the entire document. This includes, e.g., customer-related data, total cost of the order, total weight, total amount and document currency.
- **Items:** Items refer to the positions in a sales order. Thus, in this area the information about the specific products that are ordered by the customer are entered. For instance, you can sell several products in one sales order. Each product is then entered as one item. Each item contains its own data (material data, quantities, price, conditions, etc.) and can be processed individually. Examples are material items, service items, free-of-charge items or text items.
- **Item Schedule lines:** Schedule lines contain delivery quantities and delivery dates. Schedule lines are uniquely assigned to exactly one item. That is, if you have a position in the sales order for 100 Speedstars, then the document also contains a corresponding position for scheduling (*goto → position → schedule lines*) with 100 Speedstars. The scheduling line contains the dates at which a certain quantity can be delivered. Each item, which in the subsequent process must be delivered by using an outbound delivery, must have at least one schedule line.
An item can have several schedule lines, e.g., when ordered quantities are partially delivered at different dates. In that case, one sales order item can correspond to multiple schedule lines (e.g., 50 Speedstars in 1 week, 50 Speedstars in 2 weeks).

The figure displays a sales order document and highlights these three primary areas. The view areas are grouped into **overview**, **header** and **item** screens. A new sales document is always entered on the overview screen. To efficiently process a sales document, the data is accessed on separate header and item views that contain further detailed information:

- By selecting **Goto/Header/...** from the menu you can access all header relevant data of the sales document in different tabs
- By selecting **GoTo/Items/...** from the menu you can access all data relevant for a specific item in different tabs

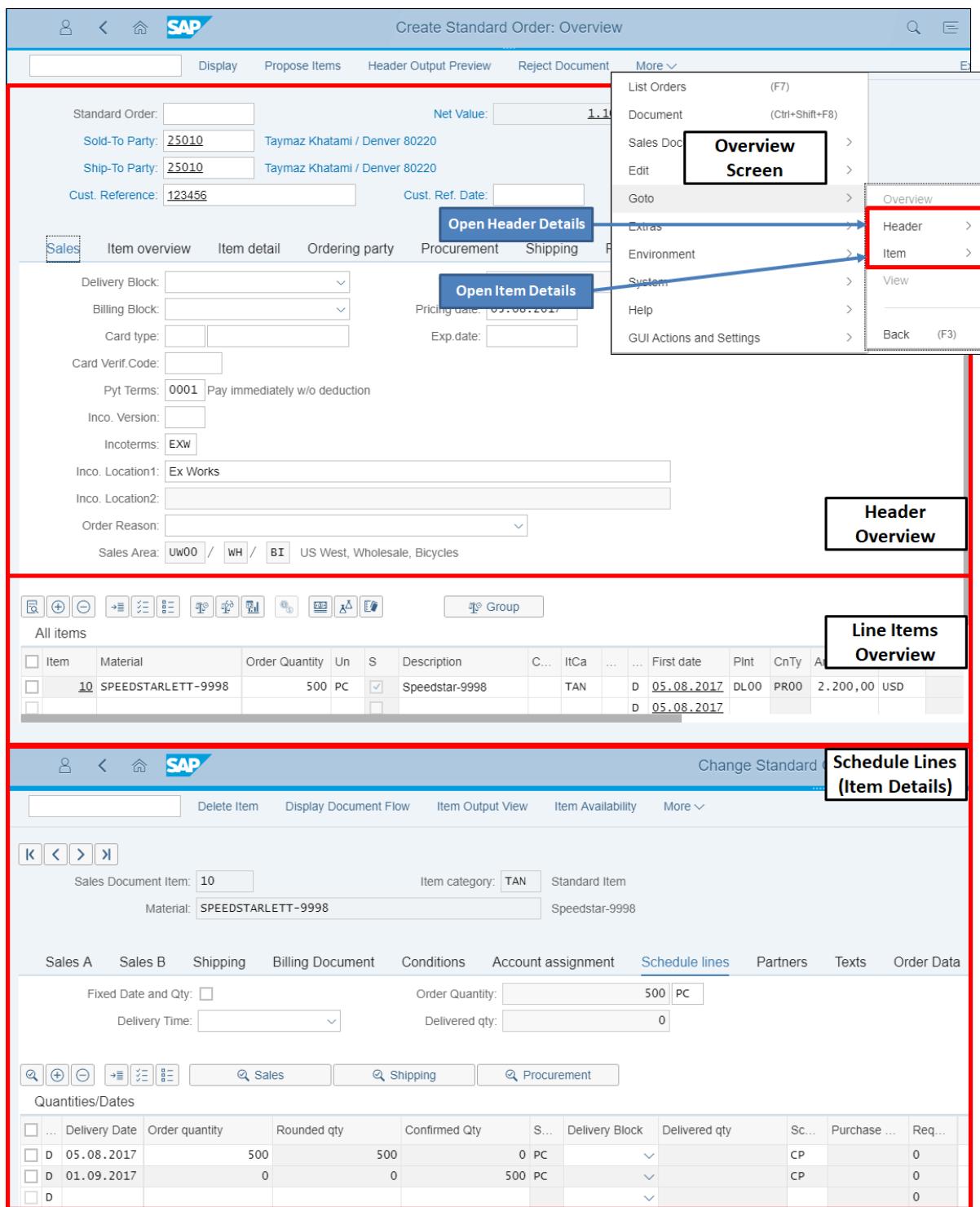


Figure 38: Sales Order Document Structure: SAP-System-Screenshot

3.1.2.3 Functions of a Sales Order

The transaction type of the sales document determines the number of functions that are available in the sales document and the functions that are executed automatically upon creation of the sales order. Which functions are available, and which one is triggered automatically is set in the system's customizing for the particular transaction type. Examples for functions that can be triggered from within a sales order (either manually or automatically) are:

- Material Exclusion
- Free Goods

- Material Substitution
- Incompletion Log
- Partner Determination
- Texts determination
- Availability check
- Shipment scheduling (Shipping point and route determination)
- Transfer of requirements to MRP
- Pricing
- Credit limit check
- Output generation (e.g. order confirmation)
- Statistics update (LIS)

For instance, the standard sales order process uses the transaction type OR (Standard Order or Telesales). For this order type following customizing settings are set as per default:

- A credit limit check is executed automatically, if the customer master contains a credit limit segment
- A transfer of requirements to MRP takes place and creates an independent requirement for the materials specified in the items of the sales order
- The availability check automatically determines the time the customer receives the ordered goods and assigns the dates in the scheduling lines of the sales order items.
- Outputs, such as order confirmations, must be executed manually.
- You can deactivate pricing determination functions and overwrite conditions manually, if you e.g. want to enter an individual price or process the sales order for a delivery that is free of charge.

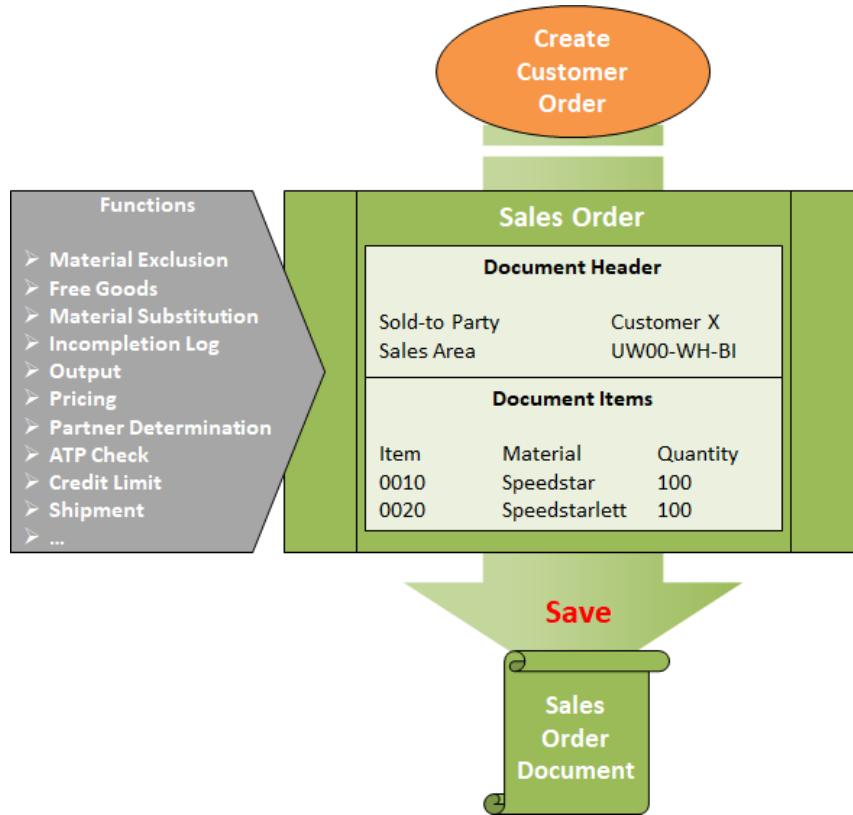


Figure 39: Functions of a Sales Order

3.1.2.3.1 Partner Functions in Customer Master and Sales Transactions

One important aspect in the customer master data is the so-called **Partner Function**. Partner functions are used to identify and include business partners (e.g., customer) in a sales process and determine their rights and responsibilities in different business transactions. For each partner function, a customer ID is assigned that identifies the customer who is the responsible person in the SD business transaction.

The assignment of a partner function to a customer master data record is done on the **partner functions** tab in the customer's master *sales area data* screen of the **Customer** business role. A customer can have multiple partner functions assigned, each for a different business transaction. Partner functions like sales employee, contact, etc. are optional. However, in the sales process the partner functions **sold-to-party**, **ship-to-party**, **bill-to-party**, and **payer** are mandatory and must have been maintained in the customer's master data:

- **Sold-to party:** This partner function identifies the business partner (customer) who buys the material from your company. This customer is then also used to derive data on sales such as the assignment to a sales office or a valid price list.
- **Ship-to party:** This partner function identifies the business partner (customer) to whom the material is shipped. This customer is then used to determine data for shipping such as unloading point and goods receiving hours or address to which the material is delivered.
- **Bill-to party:** This partner function identifies the business partner (customer) to whom the billing document (invoice) is sent. This customer is then used to determine the billing address and data on document printing and electronic communication.
- **Payer:** This partner function identifies the business partner (customer) that pays the bill. This customer is then used to retrieve data on billing schedules and bank details.

The partner functions assigned in the customer master data can all refer to the same customer ID. In the following figure, you can see the example from our practice chapter. Our customer 25005 has the four mandatory partner functions assigned. In each case, the partner function refers to the same customer ID 25005. This means that our customer is at the same time the sold-to party, the receiver of the material (ship-to party), the receiver of the invoice (bill-to party) as well as the payer of the bill.

In other cases, particularly with institutional customers, the partner functions may have differing business partner IDs assigned. For instance, you sell a product to a customer, but deliver it to a different person. In that case, sold-to-party and ship-to-party have different customer IDs assigned. This is stated in the sales order document. The subsequent delivery document uses the field ship-to-party to retrieve the shipping address of the person the product is to be delivered to.

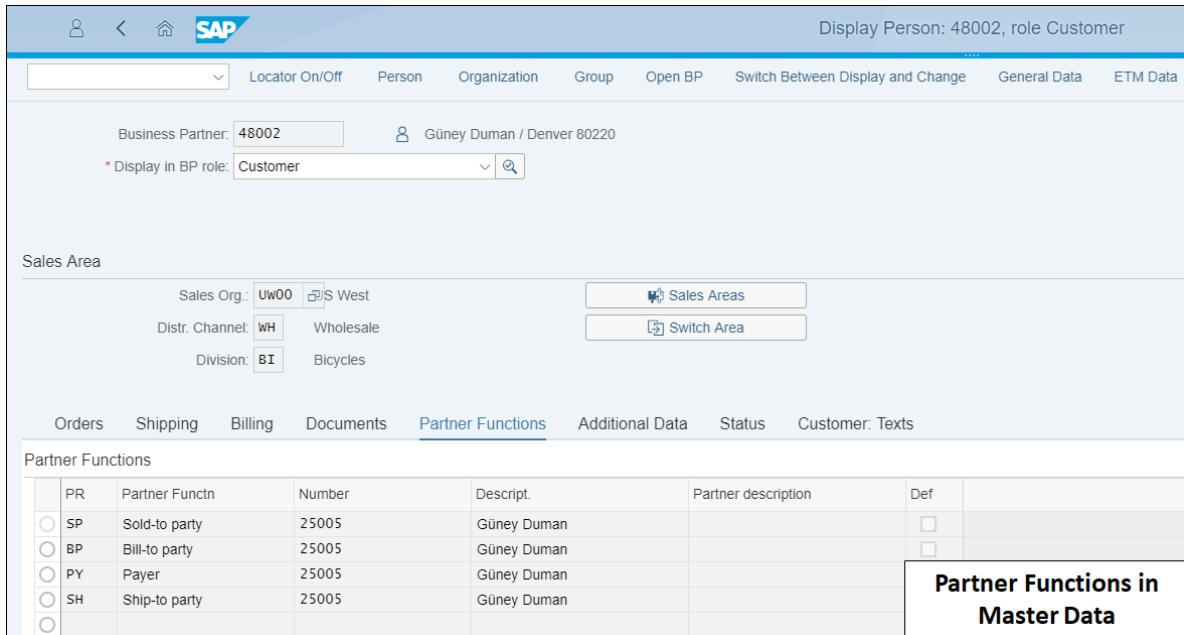


Figure 40: Partner Functions in the Customer Master: SAP-System-Screenshot

When you create a sales order in the Lead-to-Cash business process, the main entry in the sales order is the *customer ID* who wants to buy a specific material from your company. Depending on the step in the business process the different partner functions from the customer's master data are then copied into the respective sales document as default value. Generally, the SAP system is customized to allow changing these default values manually.

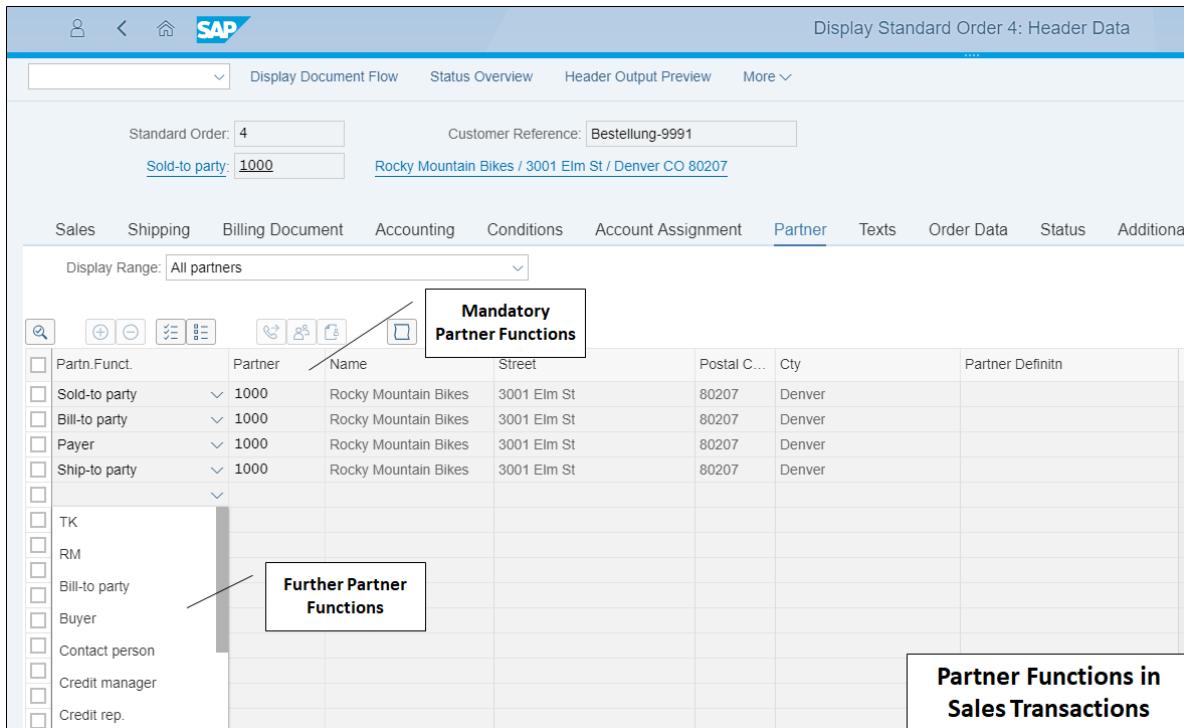


Figure 41: Partner Functions in the Sales Transaction: SAP-System-Screenshot

In the Customizing for SAP Systems, you can specify for business partners whether multiple business partners can be assigned to a partner role. If several partners are maintained with the same function, a selection list appears with these partners when a sales order is created.

In the standard system, sales documents are configured so that only one partner can be assigned for each partner role. The only exception are outline agreements – partner roles AA and AW (contract release).

In sales documents, partners can also be determined independently at item level for each item. For this purpose, the following can be defined in Customizing:

- You can define which partner roles are mandatory at item level.
- It can be defined that already entered partners cannot be changed. For example, it can be specified that the Sold-to Party cannot be changed in the sales document.
- It can be defined that the address of a partner, such as the address of the Ship-to Party, can be entered or changed manually. This change has no effect on the customer's master record.

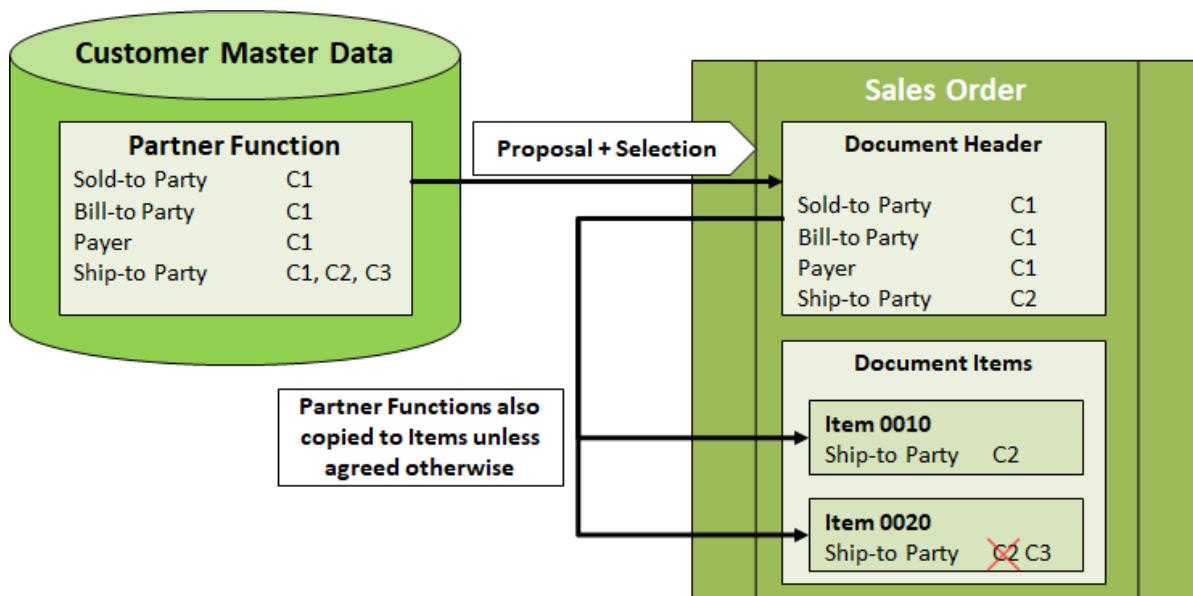


Figure 42: Partner Functions in Sales Transaction

3.1.2.3.2 Pricing

In a sales document, pricing is executed based on the availability of condition master data within the system. Thereby, the system determines the price for each line item by checking sales conditions, contract, agreements, etc. that exist for the specific customer-material combination or for the material. The price determination automatically includes discounts, surcharges, taxes, and freight costs. You can also change (overwrite) these conditions directly in the sales transaction or enter conditions manually in case no condition master data exists for a customer or material.

The system displays pricing information for all sales documents on the pricing screens at both the header and the line item level. Thereby, header pricing is valid for the whole sales order and depicts the sum of all line items within the order. Line item pricing is specific for each material. The price determined by the system can be changed manually by the sales employee, in the sales order, at both the header and line item level by entering a condition type (e.g. PR00) and amount. Taxes and freight are determined by the system based on system settings (e.g. value added tax). These components of the final price cannot be entered or changed manually.

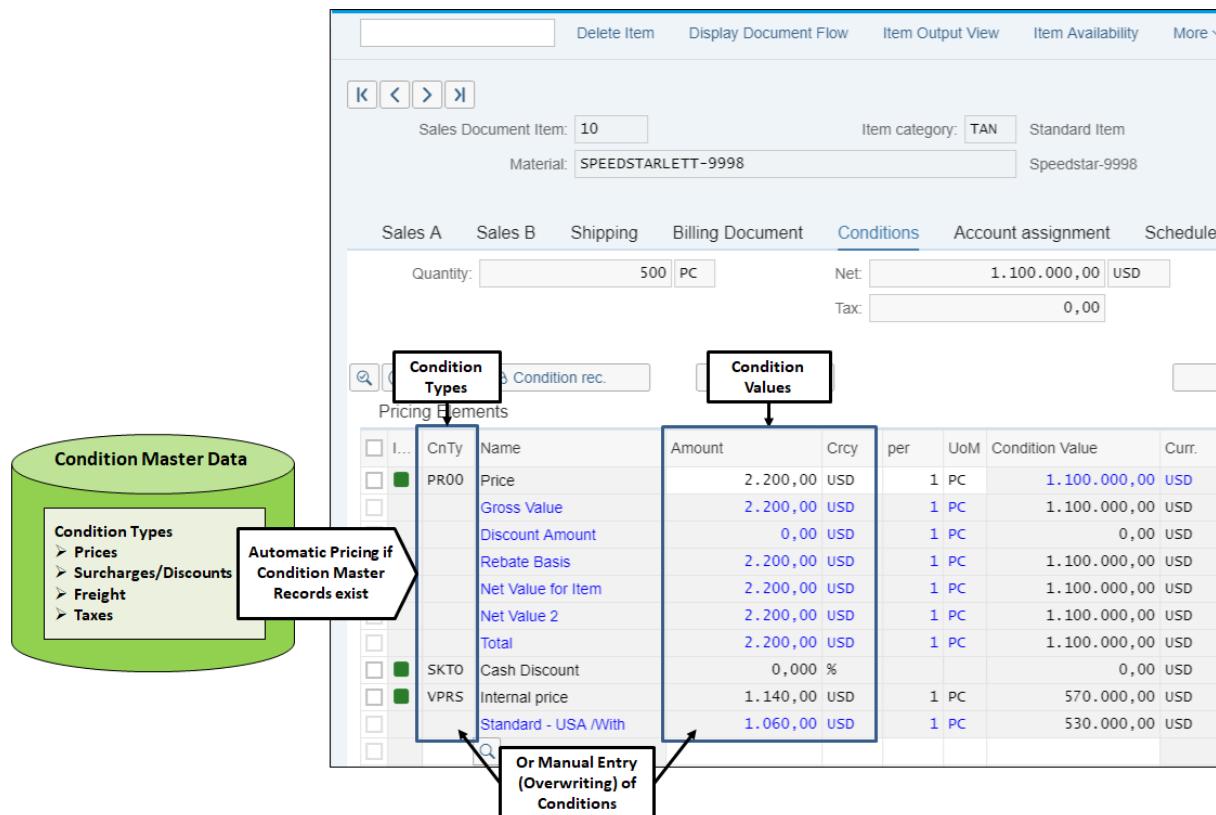


Figure 43: Pricing on Item Level: SAP-System-Screenshot

3.1.2.3.3 Availability Control

When creating a sales order, you can only confirm the delivery of the goods for the required delivery date if the goods are available for all the necessary processing activities, which take place before delivery.

From within the sales order an availability check can be executed manually or automatically. The availability check determines the date on which the requested material will be available for delivery.

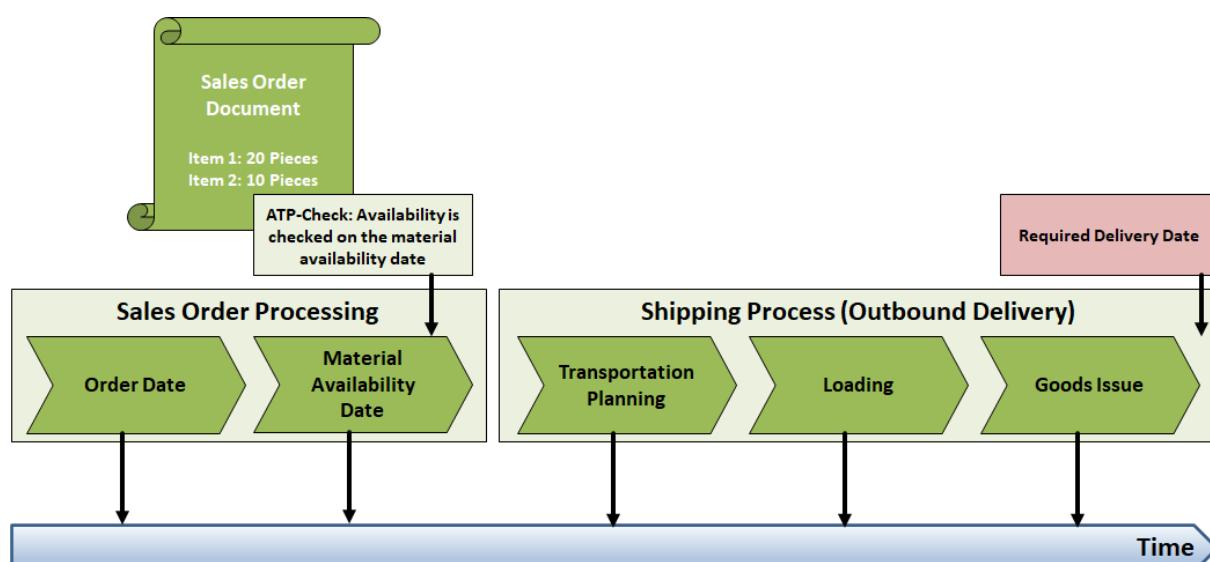


Figure 44: Sequence for ATP-Check

The availability check in sales orders is always performed at plant level for each sales order item. The corresponding plant is either derived automatically or can be entered manually. In case of automatic determination, the system looks for a valid default value for the plant in the relevant master data using the following order:

1. Customer-material info record
2. Ship-to party role in the customer master record
3. Material master record

When the availability check is executed, it considers all inward and outward inventory movements that already have been scheduled for the requested material. How the availability check is performed, is controlled via the **availability control indicator** that is set in the sales and distribution view (**Gen./Plant**) in the material master of the specific material.

There are also various tables in Customizing, on which the availability check is also dependent.

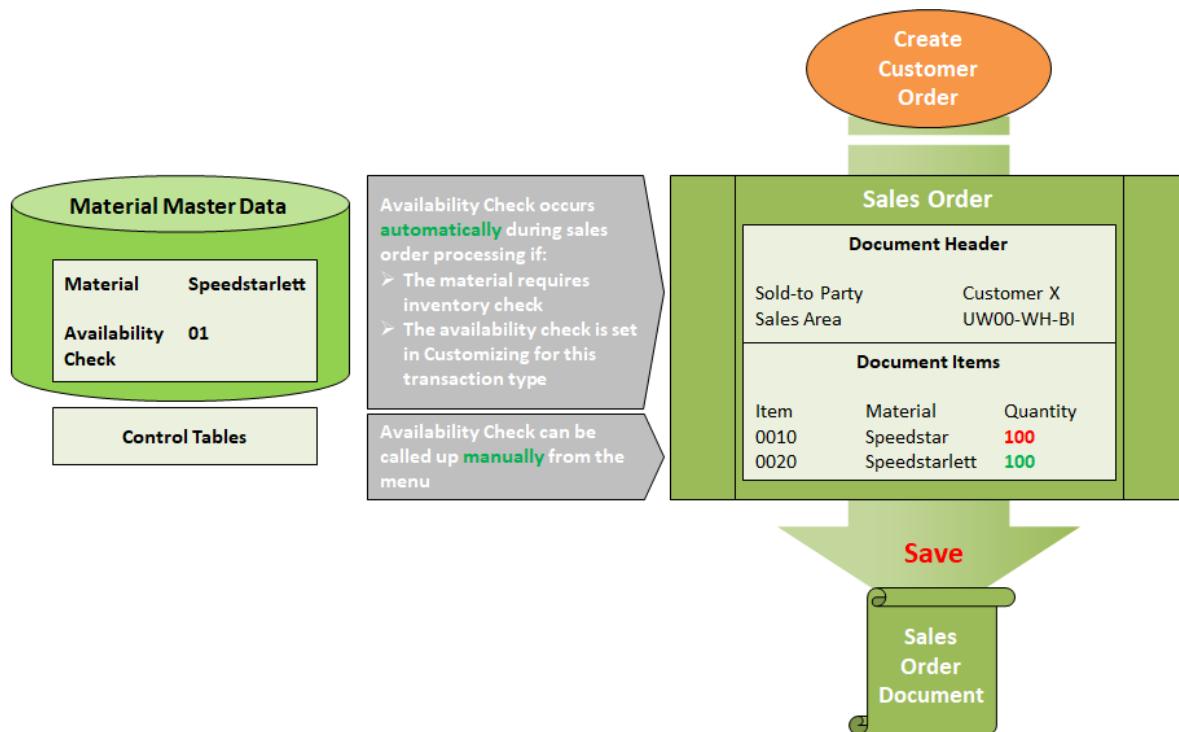


Figure 45: Availability Check (1)

Once the availability check is executed, the system can make one of the following three delivery proposals, from which the sales employee can choose:

- *One-time delivery*: The system checks whether the delivery date that the customer requested can be met. If the material is available on stock in a sufficient quantity so that the delivery on the requested delivery date can be performed, the stock quantity is confirmed here. If there the stock quantity is not sufficient, the system displays a confirmed quantity of zero.
- *Complete delivery*: The system checks whether there will be sufficient stock for complete delivery at a later date. If, at a later date, sufficient stock quantities are available to cover the required quantity in the sales document, then the system proposes

the date here. In case that the system determines that complete delivery cannot be made at a later date, no date is proposed.

- **Delayed proposal:** The system checks whether and for which dates partial deliveries can be made. Partial deliveries are displayed for different dates. These dates are based on the planned inward and outward movements of stock.

From this Availability Control screen further functions can be accessed:

- **Available-to-Promise (ATP) quantity:** Displays a Stock/Requirements list-like table where all available, planned ingoing and planned outgoing quantities are considered.
- **Scope of check:** Here you can determine which elements should be considered in the determination of the available quantity. Examples are, include quality or blocked stocks, include purchase orders, etc.
- **Other plants:** Here you can check if the required material is available in a different plant of the company and if it can be procured internally.

Figure 46: Availability Check (2): SAP-System-Screenshot

The required material availability date is determined on the basis of the customer's requested delivery date. Consider that on this required material availability date, picking, packing, labeling, and loading the goods must begin (see next chapter). Therefore, the required material availability date is significant for requirements planning and you need to check availability on this date.

3.1.2.3.4 Incompletion Log

Each sales and distribution document contains data relevant for the document and for further processing. The fields required for further processing of a sales document are checked at the time of entering the data. The system determines the required (mandatory) fields that the user

did not fill and displays them in the incompleteness log. For instance, mandatory fields in a sales document are

- Customer ID
- Generally, the entry of at least one item (e.g. material or service)
- Pricing condition

In the system's customizing, you set which fields are included in the incompleteness log for a specific transaction type (e.g. Standard Order OR). The functions for the incompleteness log are available in sales documents and in delivery documents.

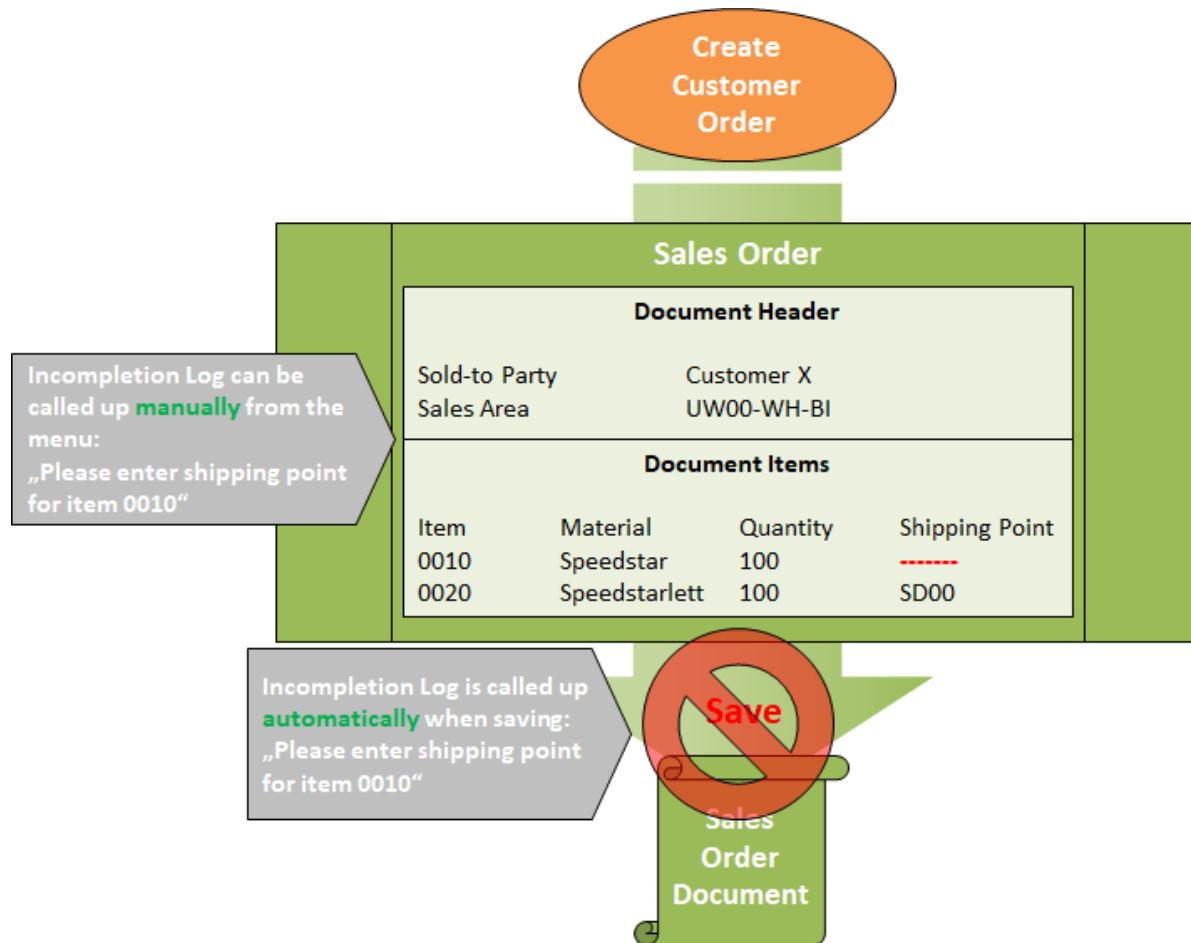


Figure 47: Incompleteness Log (1)

If you try to save a sales document that is incomplete – that is, one or more mandatory fields are not filled – the system will issue an error message and display the incompleteness log *automatically*. The incompleteness log can also be accessed *manually* by selecting *More → Edit → Incompleteness log* from the menu.

The incompleteness log is, for example, displayed when payment conditions are missing in a sales order. This is usually due to incomplete customer master data maintenance, since this is where payment conditions are entered.

The figure illustrates the incompleteness log for a sales order where the shipping point is missing on item level. By marking the row and pressing the button **Complete Data**, the system navigates directly to the field that needs to be filled.

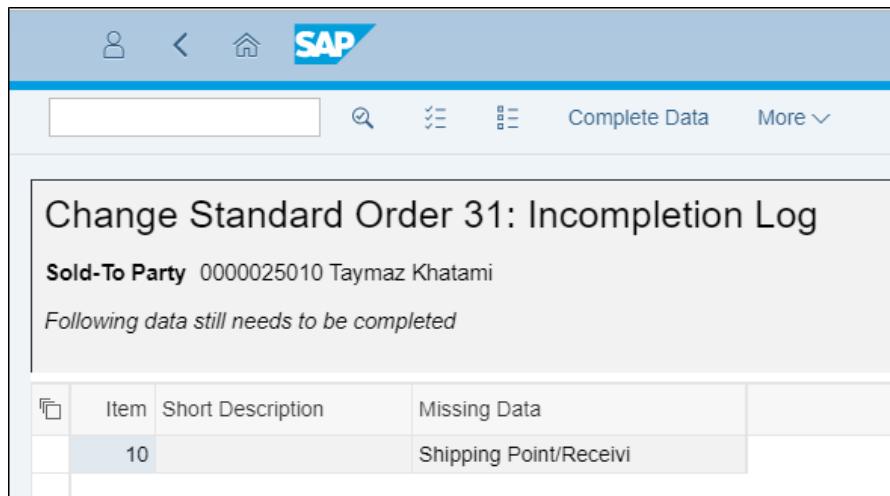


Figure 48: Incompletion Log (2): SAP-System-Screenshot

3.1.2.3.5 Output

We have already introduced the output (message) management for documents in the SAP system in the Procure-to-Pay business process. Output represents information that can be sent to the customer via different media such as e-mail, mail, EDI, fax, or XML. Examples are the printout of a quotation or an order confirmation, order confirmations via EDI, or invoices via fax. Every sales and distribution document (e.g. quotation, sales order, outbound delivery, billing) can generate outputs.

What output is generated from a sales document is based on conditions to be fulfilled. For that reason, outputs use, like pricing functionalities in a sales document, the condition techniques the SAP system.

Example for Condition Technique:

You create a sales order for a customer. As a standard process in your company, the customer receives a printout of the sales order confirmation via mail. For this, you define in customizing of the sales order that an action is executed, which prints out the sales order confirmation and initiates the mail delivery, when the condition "document saved" is fulfilled. In the sales process, when you save the sales order, this action is executed.

In the output master data, you define the following for an output:

- Output types, e.g., Quotations, Order Confirmations, and Invoices
- Partner functions, e.g., Sold-to Parties, Ship-to Parties, and Bill-to Parties
- Transmission media, e.g., Printers, Telex, Fax, Mail, and EDI.

Output layout is defined by a form in SAPscript, Smartform, or PDF. The form is then assigned to an output type. A form is a pre-defined standard form in which you can enter data manually or the system generates the data according to the sales process.

Output can be sent, for example, as soon as data is saved, or by means of a standard program that is run regularly (RSNAST00).

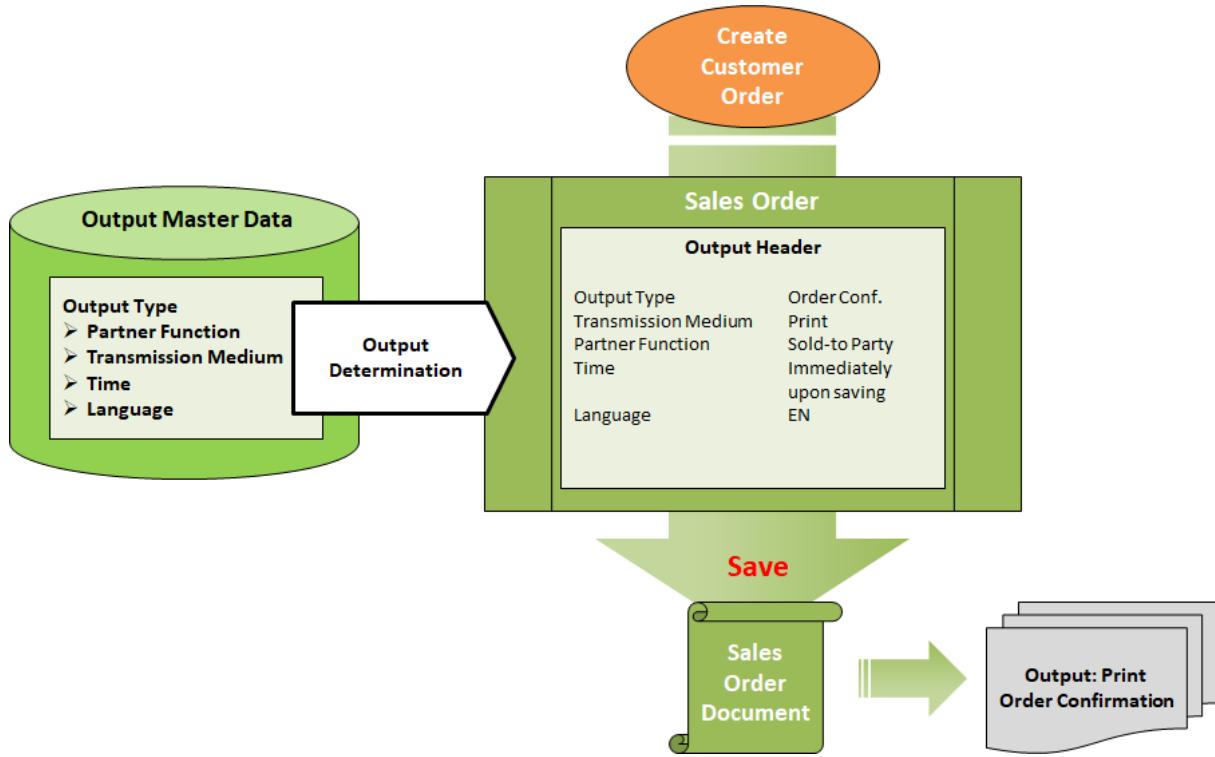


Figure 49: Output-Processing (1)

In a sales transaction (e.g., inquiry, quotation, sales order) the output documents can be viewed, maintained and manually (re-)executed by selecting **Extras/Output/Header** or **/Item** from the menu.

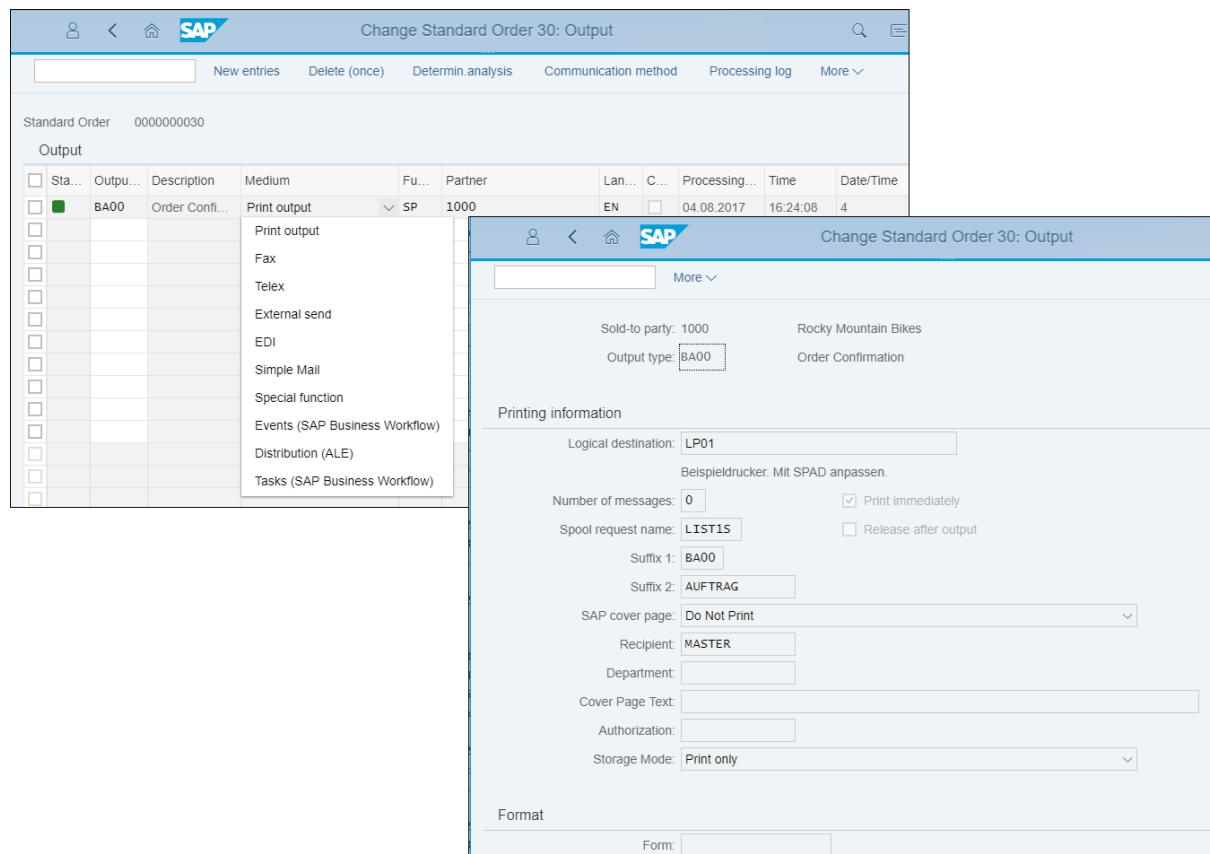


Figure 50: Output-Processing (2): SAP-System-Screenshot

3.1.2.4 Document Flow in the Lead-to-Cash Business Process

The Lead-to-Cash business process is fully integrated. That means that besides the master data and organizational data, all process data is integrated within a so-called **document flow**. This document flow is established by the automatic linking of all documents that are created along the Lead-to-Cash business process with reference to a preceding document. This means that if you create a sales order with reference to a quotation, then both will be available in the same document flow.

The document flow of an ideal sales process contains the following consecutive documents:

- Inquiry – Quotation – Sales order
- Delivery
- Billing
- Invoice
- Customer Payment (not part of SAP SD but SAP FI)

Each document in the document flow copies data that it requires from its preceding document, without the need for manual data entries. The document flow and order status feature allow finding the status of an order at any point in time. The SAP system updates the **statuses** of each involved document (specifically the status of the sales order) every time a change is made to any document created in the Lead-to-Cash business process. Thereby, the document flow is updated on **header** level and on **item** level. Hence, the document flow allows for accessing the **current status** and the **history** of a sales process at any time and, thus, allows controlling how far the sales document has been processed.

Transfer orders and goods issues that are posted for a delivery document in the Material Management or Logistics Execution applications are also displayed in the document flow.

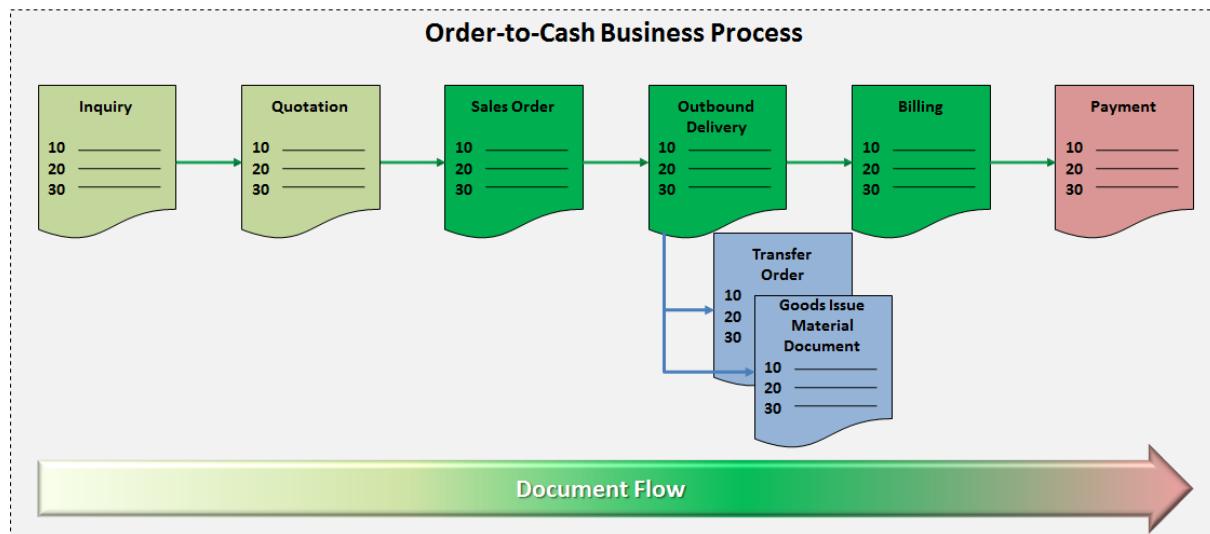


Figure 51: Document Flow of the Lead-to-Cash Business Process

You can access the document flow in using the SAP GUI by opening any of the documents in their respective transactions and pressing the document flow button (). The individual transactions are:

- VA12 – Inquiry
- VA22 – Quotation
- VA02 – Sales Order
- VL02N – Outbound Delivery
- VF02 – Billing

The document flow will then be displayed as a list containing all preceding and consecutive documents of the specific document that was invoked linked with each other. The list also contains information on the status of each document as well as revenue values, quantities and completion dates. This provides sales employees with a constant overview of the development of the sales process and allows them to answer customer queries timely and reliably.

Document	Quantity	Unit	Ref. Value	Currency	On	Status
Standard Order 0000000005 / 10	500	PC	1.100.000,00	USD	06/15/2017	Completed
Outbound Delivery 0080000003 / 10	500	PC			06/15/2017	Completed
WMS Transfer Order 0000002002 / 1	500	PC			06/15/2017	Completed
GD goods issue/dely 4900002069 / 1	500	PC	570.000,00	USD	06/15/2017	Complete
Invoice 0090000003 / 10	500	PC	1.100.000,00	USD	06/15/2017	Completed
Accounting Document 0090000003	500	PC			06/15/2017	Cleared

Figure 52: Document Flow in the SAP GUI: SAP-System-Screenshot

This very useful functionality has been tremendously enhanced with the SAP S/4 HANA system when using Fiori UX. Here you can also display the document flow of the sales process from every document within the process. However, when you click on one document in the document flow, a wide range of activities is displayed, which you can invoke directly from the document flow. For instance, you could directly navigate to the product cost analysis of the product that was sold with the sales order by selecting the corresponding link from the context menu of the sales order in the document flow.

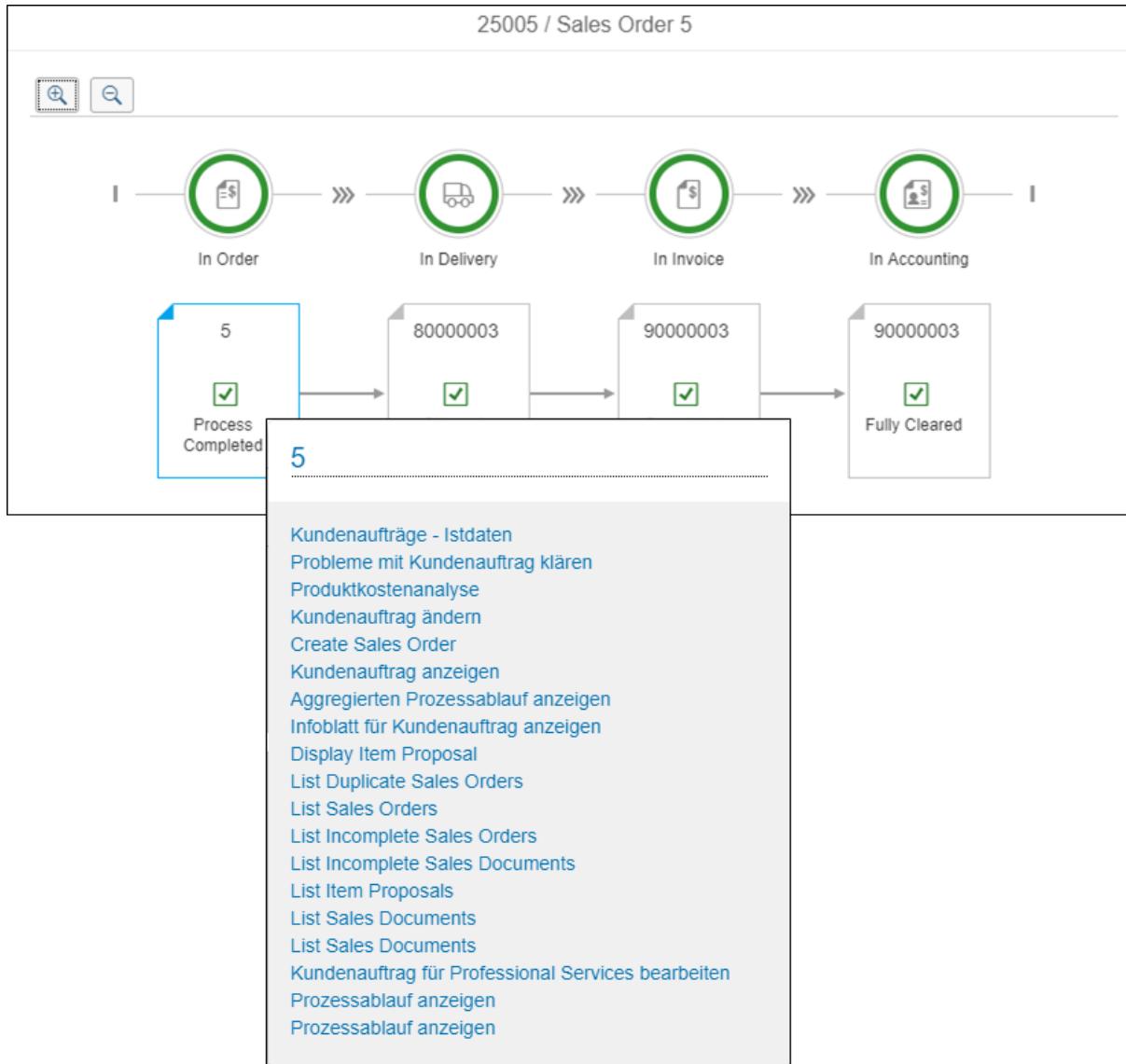


Figure 53: Document Flow in SAP S/4HANA: SAP-System-Screenshot

3.1.3 Shipping Processing

Once the materials that were ordered by the customer are ready to be shipped to the customer, the shipping process is initiated by creating an **outbound delivery document** with reference to the customer sales order. This document controls, supports, and monitors several sub-processes for shipping of which some are mandatory, and others are optional depending on the settings of the system. This includes:

- SAP SD/SAP MM: (mandatory) outbound delivery document creation (outbound delivery document)
- SAP LE (optional): picking and confirming (transfer requests/transfer orders)
- SAP LE (optional): packing
- SAP LE (optional): loading
- SAP MM/SAP FI (mandatory): Posting goods issue (goods issue material document and accounting document)

The shipping process is integrated with the Material Management (MM) and Financial Accounting (FI) applications. If Warehouse Management is active for the delivery plant

(assigned to a warehouse number) and the items of the delivery document are relevant for picking, then the shipping process is controlled by a warehouse number and is integrated with the Logistics Execution application.

3.1.3.1 Creating an Outbound Delivery

You initiate the shipping activities by creating outbound deliveries.

The responsible organizational unit for creating deliveries is the **shipping point** as the highest-level organizational unit of shipping that controls all shipping activities. Each outbound delivery is processed by one shipping point.

The responsible shipping point is determined for each order item. The system automatically proposes a shipping point, which can be changed within given limits. The shipping point cannot be changed later in the saved outbound delivery document. When an order is processed for delivery by the shipping point, the system only copies those order items into the outbound delivery that are defined for this shipping point. Order items with different shipping points are therefore not copied into the same outbound delivery.

Before an order can be delivered, the following must be fulfilled:

- A ship-to party is available in the sales document
- A plant is available in the sales document
- A shipping point is available in the sales document
- The schedule lines need a confirmed quantity, and the order must be due.

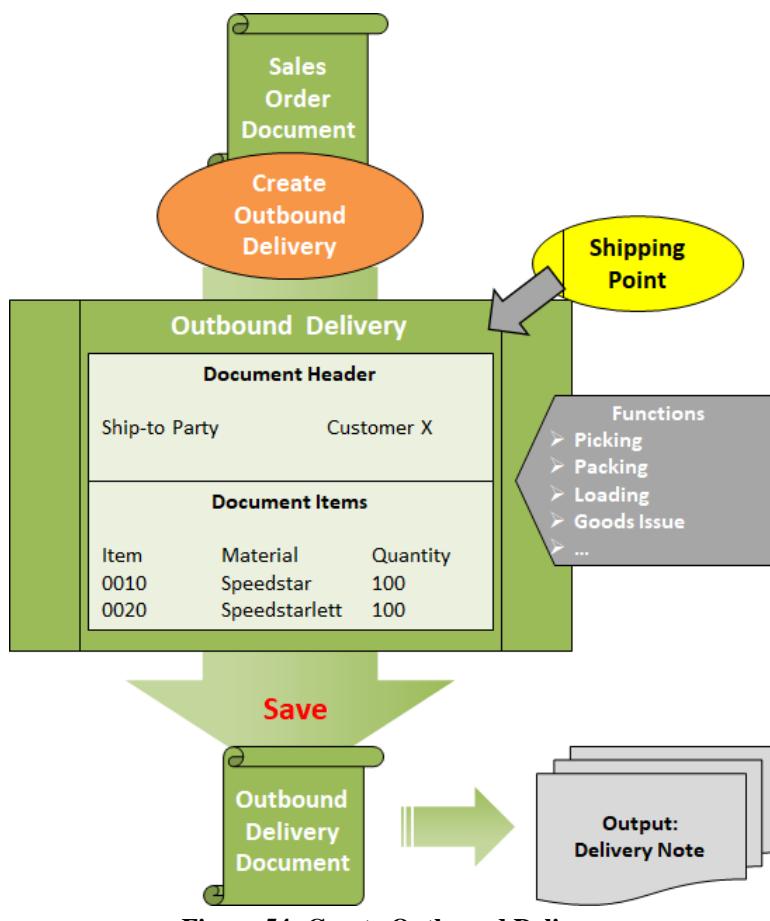


Figure 54: Create Outbound Delivery

An outbound delivery is created for orders that are due to delivery in a shipping point of the delivery plant. Outbound deliveries can be created in the SAP system either in a dialog process (transaction VL01N or Fiori App *Outbound Deliveries*) or by using background processing to create multiple outbound delivery documents in a batch job at times of low system workload (e.g., at nights).

When creating a delivery document data relevant for the shipping process – such as materials and quantities and delivery dates – are transferred from the sales order to the outbound delivery document. Thereby, all relevant data for the outbound delivery is stored in the schedule lines of the sales order document and, consequently, each schedule line in the sales order corresponds to an item of the outbound delivery document. That is, the schedule lines of a sales order item are transferred and converted into an item of the outbound delivery.

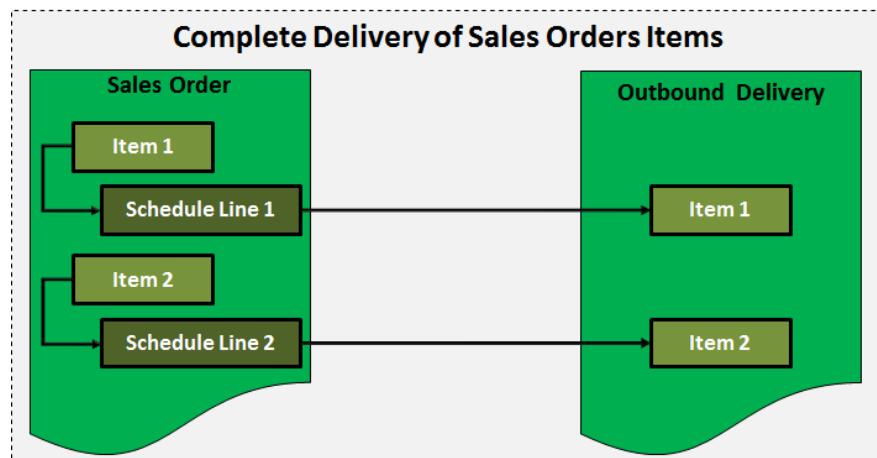


Figure 55: Complete Delivery of a Sales Order

It is possible to create multiple outbound deliveries from one sales order. This is necessary in cases where the ordered materials are shipped in partial deliveries. Here, for each batch of materials a separate schedule line is created in the sales order. That is, if an order can be partially delivered, each schedule line of the order can be processed with an individual outbound delivery.

Example:

You have sold 1000 Speedstarletts of which 500 are finished and the other 500 are still in production. The first schedule line contains 500 confirmed Speedstarletts and is copied into an outbound delivery. The second batch of Speedstarletts is then delivered with a second outbound delivery document once the materials have been produced.

You also can deliver different schedule lines (or sales order items) to different recipients. For instance, your sales order has two positions on item level. The customer is company X. The first position contains 100 Speedstarletts, the second position contains 100 Speedstars (or Speedstarletts). As you already know, you can control individual items independently from each other. Thus, you can set as ship-to-party (in the partner functions) for item 1 the customers storage location in Dallas and for item 2 the storage location in Denver. Therefore, you create two different outbound deliveries from each schedule lines in the sales order.

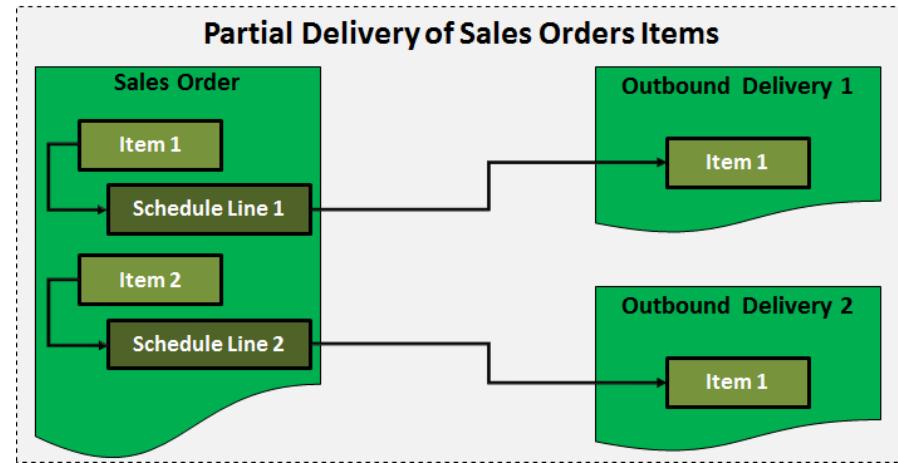


Figure 56: Partial Delivery of Sales Order Items in different Outbound Deliveries

Contrastingly, it is also possible to combine items from different sales orders into one outbound delivery. To be able to combine several sales orders in one outbound delivery, all orders must contain the same characteristics that are relevant for delivery documents. These characteristics are: shipping point, due date, and ship-to-address

Example:

You have sold Speedstars and Speedstarletts in two different sales order document to the same customer. The shipping point and the due date for the deliveries (the schedule lines in the two sales orders) are the same. You can now merge the two schedule lines in one outbound delivery document and ship the materials together to the recipient.

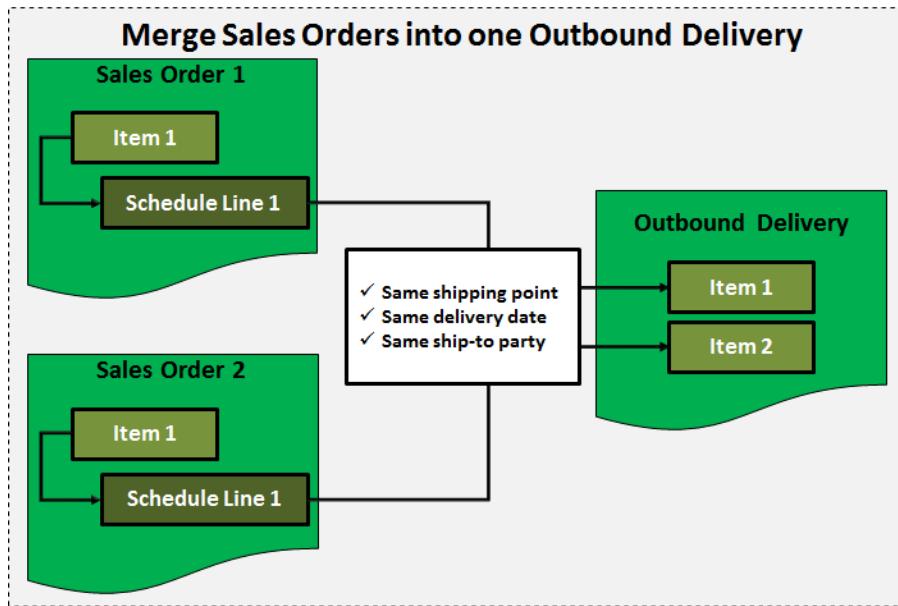


Figure 57: Merge Sales Orders into one Outbound Delivery

3.1.3.2 Outbound Delivery Document Structure

Like other document types in the SAP system, an outbound delivery document also contains the two levels header and item. Data is assigned to these levels as follows:

- **Header:** Header data is applicable to the entire document. This includes, for example, the ship-to-party and the schedules for shipping processing.

- **Item:** Each item in the delivery document contains its own data. This includes, for example, material data, quantities, weights and stock information. Each delivery document can contain multiple items that can be controlled differently. Examples are material items, free-of-charge items or text items.

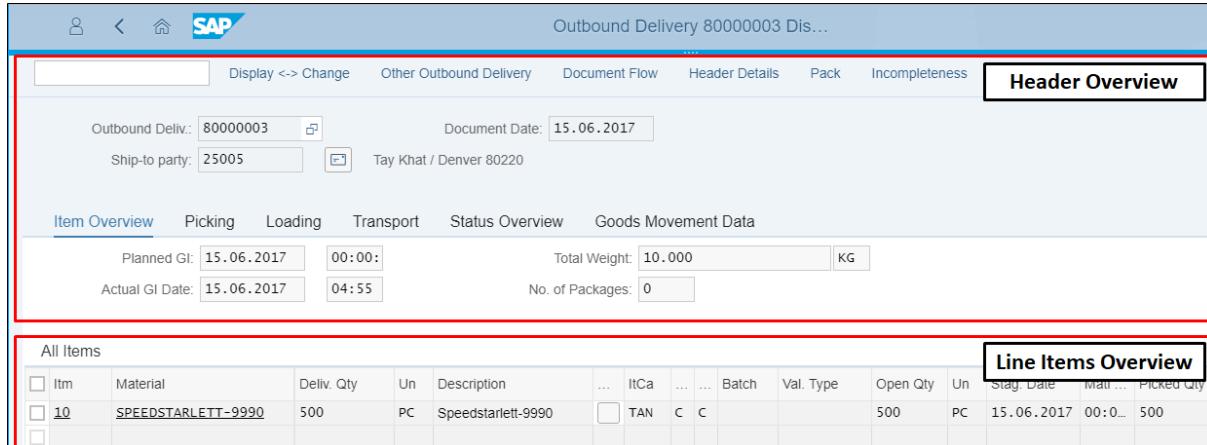


Figure 58: Outbound Delivery Document Structure: SAP-System-Screenshot

Thus, an outbound delivery document does not contain any schedule lines. As mentioned afore, a schedule line from the sales order is transferred and into an item of the outbound delivery. Thus, schedule lines become items of a delivery document. Again, for the efficient processing of delivery documents, data is displayed and maintained in different views and on different tabs. The several views are grouped into overview, header, and item screen.

3.1.3.3 Backorder Processing

Even if the various options of the standard ATP for adjusting the scope of the material availability check for sales orders to the requirements, it can happen that the delivery schedule lines of a sales order cannot be confirmed:

- If the quantity of a sales order is not completely confirmed
- Or the required delivery date for a sales order item cannot be kept

the sales order is referred to as **backorder** in SAP S/4HANA.

These sales orders can be processed using **Backorder Processing (BOP)** to find an acceptable solution to the situation.

Overview of Backorder Processing

The extended available-to-promise (aATP) was presented with SAP S/4HANA. It enables the availability of materials to be checked using backorder processing if the requirements or procurement situation has changed in an order fulfilment process and it must be checked whether the confirmations for customer orders or stock transport orders calculated at an earlier point in time are still realistic. Examples of such situations are:

- A sales order is cancelled, which frees up inventory quantities.
- An important customer increases the requested quantity for a customer order and would therefore take over the stock that is currently confirmed for other customer orders.
- A production order with the planned replenishment is delayed.

If there is no response to the changed availability situation, the confirmed quantities could exceed the available quantities. This can lead to the failure of availability checks for over-confirmed materials, which means that materials can no longer be released for the creation of outbound deliveries.

With the help of backorder processing, existing material confirmations can be changed. For example, the confirmed sales order quantity of a material for a (less important) customer can be reduced and the confirmed sales order quantity for another (more important) customer can be increased. Different **confirmation strategies** can be used, with the help of which it can be determined how the different material requirements are to be dealt with.

Key Terms in Backorder Processing

Before backorder processing (BOP) can be carried out, several elements must be configured:

- **BOP segment:** A BOP segment comprises a saved selection of settings that determine which customer requirements are selected and in which sequence the requirements are prioritized. For this purpose, it contains criteria that identify all requirements that are to be treated similarly during a BOP run. Since the availability check confirms requirements strictly according to the *first-in, first-out* principle, the way in which the requirements are classified is of central importance. A BOP segment therefore also contains a prioritizer that sorts the requirements into a dedicated sequence.
- **BOP variant:** A BOP variant is a saved selection of settings that define which requirements are contained in a BOP run, how they are checked (BOP segments) and handled now (confirmation strategies). Each BOP run is based on a BOP variant.
- **BOP run:** A BOP run is an executed instance of the background function that checks the availability of several requirements at the same time. This mass availability check of the requirements (e.g. sales order items) is carried out as a dedicated step in the order fulfilment process (e.g. after a disposition run or before creating a delivery due list). A defined sequence is adhered to and all filters defined in the BOP variant are used. A run can be simulated in the *Configure BOP Variant* app or scheduled for immediate execution. A BOP run can be scheduled by an authorized user as a one-time or regular background job in batch mode or triggered directly online.

Confirmation Strategies

Confirmation strategies are used in backorder processing to define and prioritize the handling of individual requirements in backorder processing runs when availability is limited. They can mean that required quantities are confirmed earlier, later, partially or not at all. You can do the following in the *Configure BOP Variant* app:

- Assign confirmation strategies to segments
- Assign several segments to a single confirmation strategy in a variant
- Define fallback variants for exception handling

Detailed demand filters can be defined in combination with evaluation and check sequence in order to select confirmation strategies. The following confirmation strategies are available:

- **Win:** Requirements that should be confirmed
- **Gain:** Requirements that should improve their confirmation quantity or date

- **Redistribute:** Requirements with confirmation that are recalculated. You can get a better (from fill and lose), the same or worse (losing to win or gain) confirmation.
- **Fill:** Requirements with confirmation, which are recalculated. You can get the same or worse (losing to win, gain or redistribute) confirmation.
- **Lose:** Requirements that should lose their confirmation

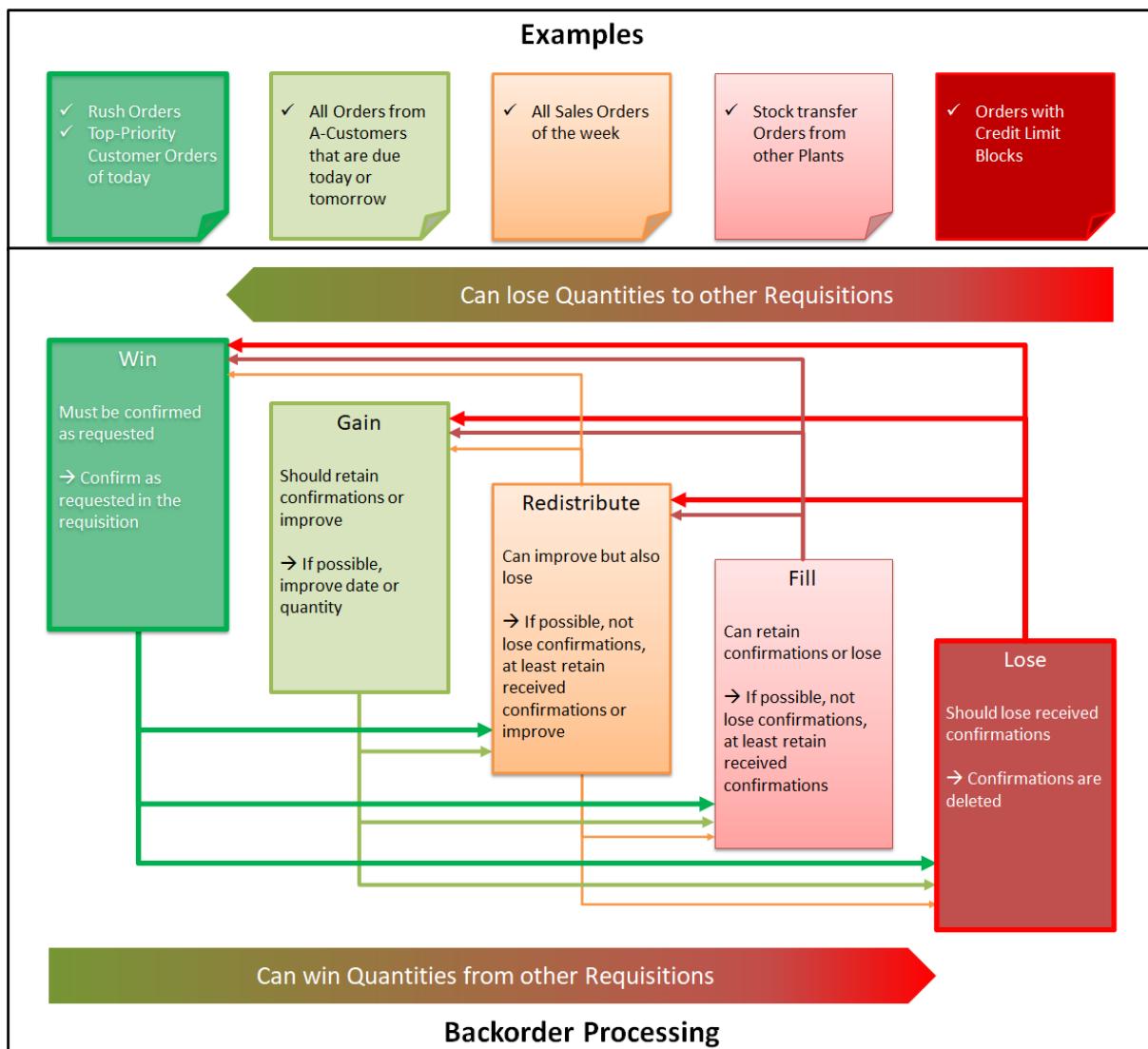


Figure 59: Backorder Processing

The following table summarizes the individual strategies and their evaluation as well as check sequences.

Confirmation Strategy	Evaluation Sequence	Check Sequence	Definition	System Behavior
Win	2	1	Assigned requirements are fully confirmed on the requested date (or immediately, if their requested material available date is in the past).	If requirements cannot be fully confirmed on time, an exception is raised. Depending on the configuration options for exception handling, the BOP run stops completely or only for the affected material-plant combinations: the corresponding sales document items are not updated.

Gain	3	2	Assigned requirements retain, at least, their confirmation or, if possible, improve.	If current confirmations cannot be retained, an exception is raised. Depending on the configuration options for exception handling, the BOP run stops completely or only for the affected material-plant combinations and the corresponding sales document items are not updated..
Redistribute	4	3	Assigned requirements can get a better, equal or worse confirmation.	BOP may release quantities of requirements so that they can be used to fulfill requirements with higher priorities. BOP may produce a worse confirmation when requirements with a higher priority have reduced the available quantity.
Fill	5	4	Assigned requirements do not gain additional quantity or get an earlier confirmation date. They get an equal or worse confirmation.	To confirm requirements from Win and Gain, BOP releases quantities of requirements assigned to Fill. This can result in a later confirmation or a loss in confirmed quantity.
Lose	1	5	Assigned requirements lose their current confirmation and are not confirmed.	The released quantity of the Lose requirements can be used to confirm more important requirements or left as quantity available to confirm future requirements.
Überspringen	Nicht zutreffend	Nicht zutreffend	Assigned requirements retain their current confirmation and are not included in an availability check.	These requirements are not included in an availability check when, for example, the fixed quantity/date flag is set in the sales document.

3.1.3.4 Functions of an Outbound Delivery

The **outbound delivery document** is the central document for controlling and monitoring the activities within the shipping process. These activities are among others:

- Transportation relevance
- Route determination
- Picking
- Packing
- Loading
- Goods issue posting
- Output determination (shipping documents/delivery notes)

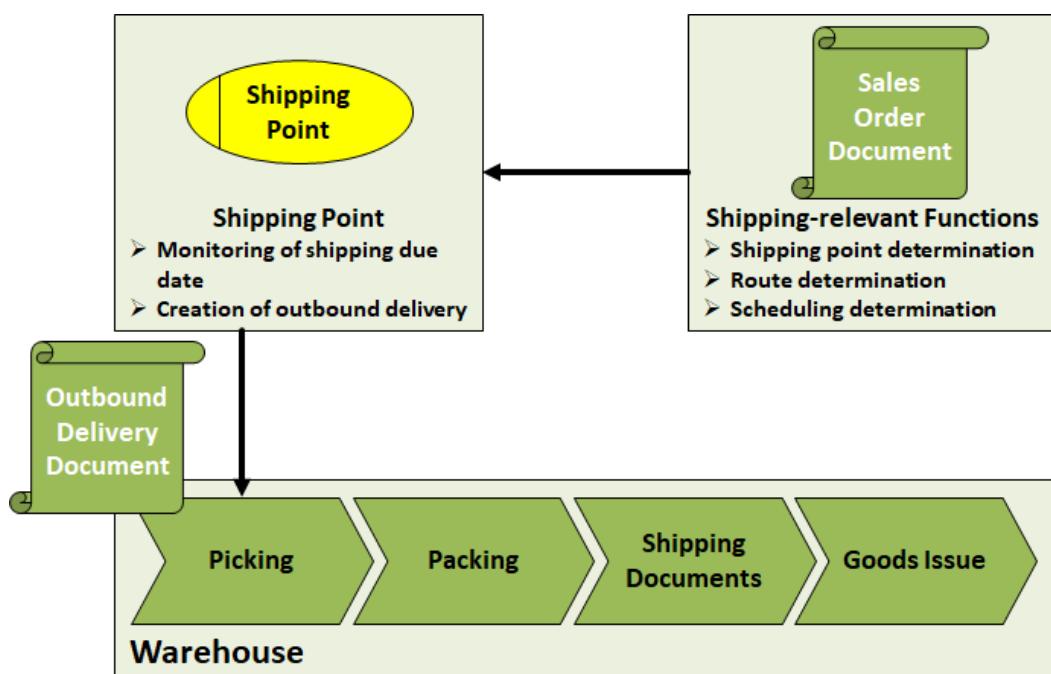


Figure 60: Functions of an Outbound Delivery

Most of the activities are controlled and monitored by statuses on the *Status Overview* tab of the delivery document. Consider that not all activities are relevant for each outbound delivery and depend on the Customizing settings or the particular document item, the implemented and involved SAP applications, and the company's processes and their mapping in the system.

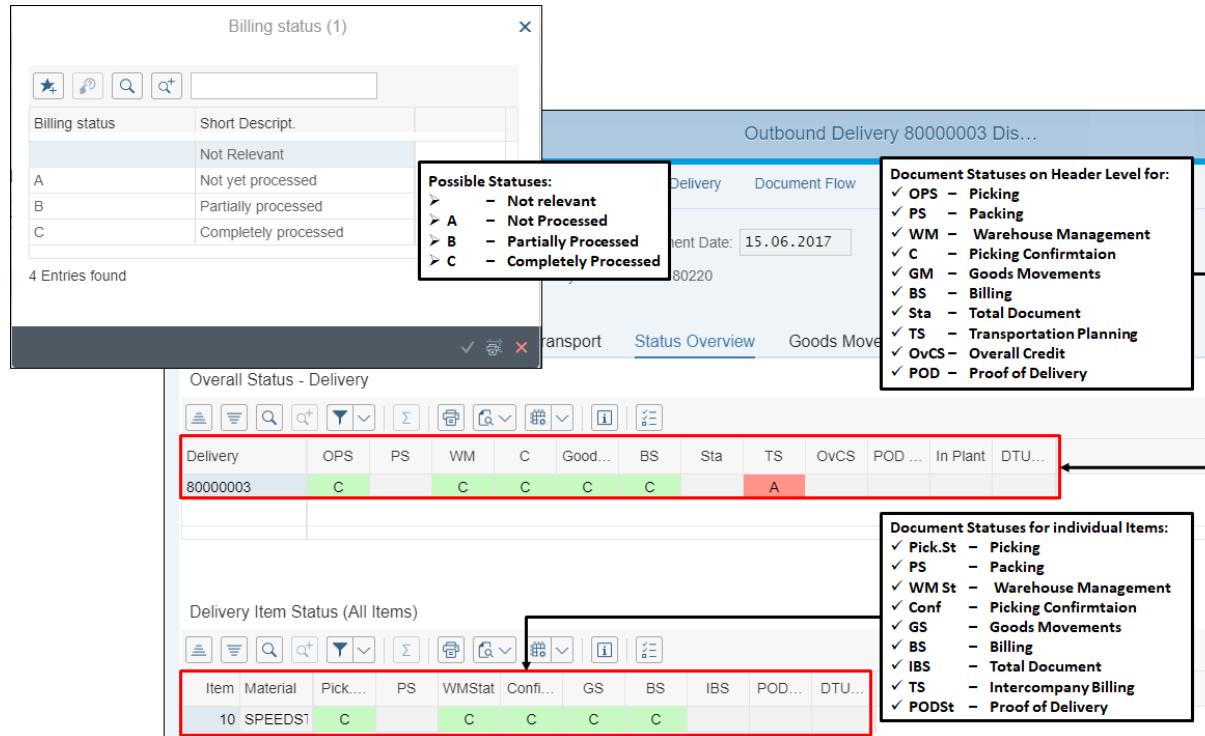


Figure 61: Functions and Statuses of an Outbound Delivery: SAP-System-Screenshot

For instance, if an item such as a material position from a sales order is **relevant for picking** due to the settings for the particular item type in the system's customizing and if **Warehouse Management is active** and goods movement processes are **controlled by a warehouse number** to which the involved delivery plant for the material is assigned, then the picking process is mandatory for the outbound delivery and a transfer order must be created for internal shipping processes. In this case, the statuses for Picking (Pick.St./PS), Warehouse Management (WM St/WM), and Picking Confirmation (Conf./C) must all have the status C (Completely Processed), before a goods issue can be posted with reference to the outbound delivery document in order to ship the materials out of the storage location to the customer. This means, that in this case a transfer order must be created with reference to the outbound delivery in order to pick the material and move it within the warehouse number from the location it is stored to the location where it is shipped out. After the transfer order is confirmed the statuses of the outbound delivery document are set accordingly and a goods issue posting is possible. Contrastingly, if WM is not active or not implemented, then the afore mentioned three statuses are not relevant for the outbound delivery and a goods issue can be posted immediately.

3.1.3.4.1 Picking

An outbound delivery document contains all the data that is required for triggering and monitoring the entire outbound delivery process and, therefore, is the basis for the execution of picking activities. **Picking** is the process by which materials to be sent to a customer are

collected in the warehouse and transported from that location of the warehouse complex to another location within that warehouse complex.

Picking is an **optional** step in the shipping process. However, in most cases it is carried out to obtain better control and monitoring of intra-warehouse movements, stocks (quantities), storage locations and quality.

Picking is **mandatory** if warehouse management (either complete warehouse management with EWM or lean WM) is active, the delivery plant is assigned to a warehouse number, and the order item type is set as **relevant for picking** in Customizing for the system.

When *SAP Extended Warehouse Management (EWM)* is used and the goods issue is posted for an outbound delivery, a final **outbound delivery order** is created in SAP EWM automatically, which triggers the goods issue posting in inventory management (see also EWM chapter in this teaching unit). To execute physical goods movements **within** the warehouse, warehouse tasks are used, which are required for the following:

- Picking
- Putaway
- Internal Movements
- Posting Changes
- Goods Receipt Postings
- Goods Issue Postings

Picking is often done by printing a **picking list**. You can carry out picking either for **individual** deliveries or using **collective processing** so that only one follow-up document is created for several preceding documents. For instance, you might want to combine the materials for multiple sales orders in one delivery or create one invoice for multiple outbound deliveries. Generally, this procedure is possible, but the result depends on the values contained in certain fields in the selected documents (split criteria). For collective processing, a worklist is selected from all outbound deliveries and the relevant deliveries are processed.

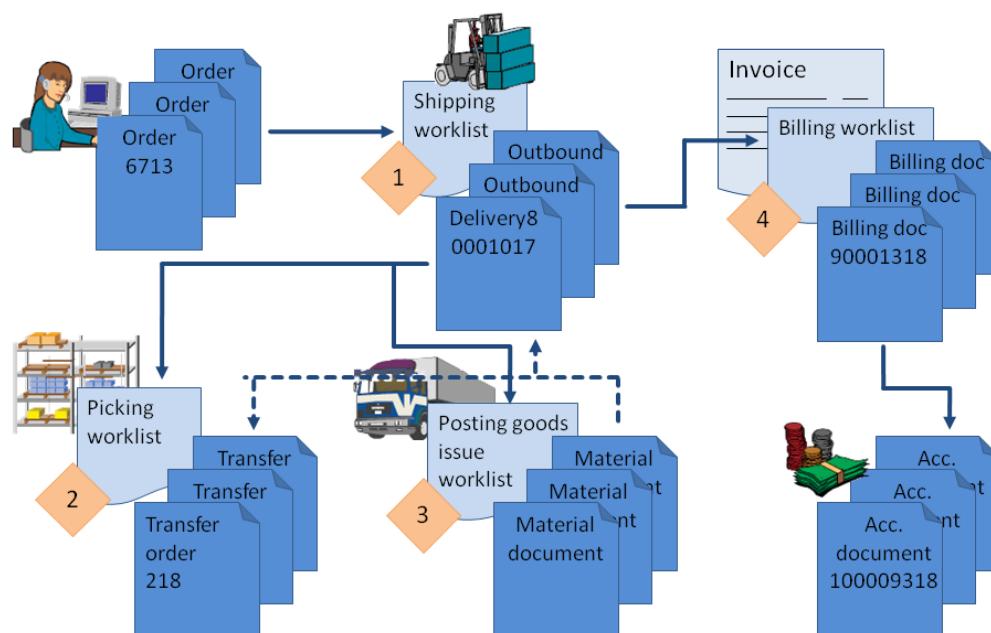


Figure 62: Worklists in SAP S/4HANA

In the standard configuration of the system the prerequisite for the posting of goods issue is, that picking relevant items are *completely picked*. This means that the delivery quantity and the picking quantity must match in the delivery.

As soon as the materials have been picked and transported to the destination storage bin for the final delivery, the transfer order is confirmed. When you confirm a transfer order, you confirm the quantities that have been withdrawn from the warehouse. The picking confirmation can be carried out manually either automatically or in a separate processing step.

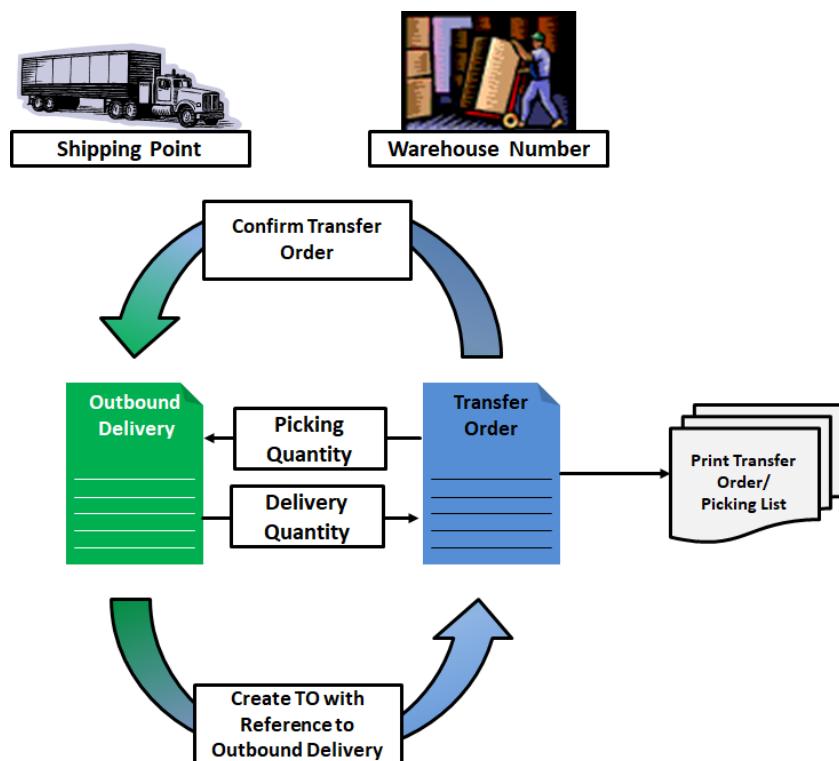


Figure 63: Picking in the Shipping Process

3.1.3.4.2 Posting a Goods Issue

The last step in the delivery process is the posting of the goods issue with reference to the outbound delivery. It is also possible to post the goods issue directly from the outbound delivery document. With this posting, the status of the shipping documents is updated, and the outbound delivery is set to *complete*.

The data that is required to post the goods issue is copied from the outbound delivery into the goods issue document. The goods issue document is generated automatically and cannot be changed manually. If any changes occur after the goods issue has been posted, they must be performed in the outbound delivery document. However, after the goods issue posting, the scope for changing the delivery document becomes very limited in order to prevent any discrepancies between the goods issue document and the outbound delivery.

The posting of the goods issue for an outbound delivery leads to a series of functions that are carried out based on the goods issue document:

- The goods issue document is a **material document** that records the quantity-based changes in the warehouse. That is, the material quantity on stock is reduced by the quantity delivered to the customer. Furthermore, customer/delivery requirements are reduced by the delivery quantity in material planning.

- Along with the material document, an **accounting document** is created that automatically updates the General Ledger (G/L) accounts. Thereby, the value-based changes to the inventory are posted to the balance sheet account in inventory accounting.
- Furthermore, a **controlling document** is created in Controlling (CO)
- A **material ledger document** is created.
- Goods issue posting is automatically recorded in the **document flow** of the sales process and **updates the statuses** of all affected sales documents (sales order, quotation, outbound delivery)
- Depending on the type of billing that is set for the particular transaction type (order-based billing or delivery-based billing) an entry (billing item) is generated in the **billing due list**. This item is later used to create the customer billing document with reference to the sales order or outbound delivery.

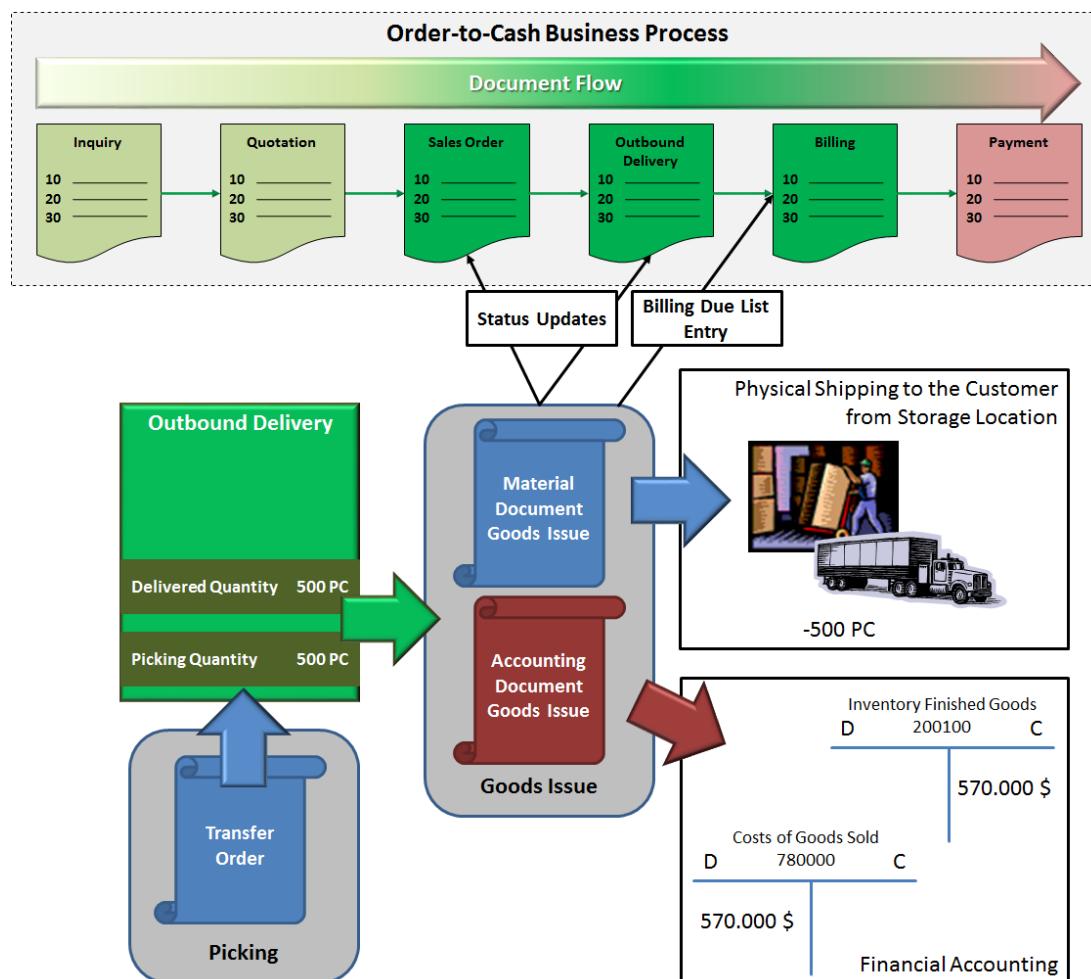


Figure 64: Outbound Delivery - Goods Issue

3.1.3.5 Elucidation: Goods Issue Integration with Financial Accounting (FI)



ELUCIDATION

As already mentioned in the Goods Issue chapter, each goods issue posting (or any valued goods movement) creates an accounting document along with the material document. The accounting document posts the value changes to the corresponding accounts in Financial Accounting (SAP FI). The accounting document of the goods issue leads to the following Financial Accounting (SAP FI) entries in the SAP system:

- A debit posting to Costs of Goods Sold account
- A credit posting on the General Ledger (FI-GL) account for Inventory Finished Goods.

Example:

A customer orders 500 Speedstarlets from your company. After production has been completed, you process the outbound delivery and post the goods issue. As you can see from the following figure, the goods issue posting with reference to the outbound delivery leads to the creation of a material document, and with the material document a separate accounting document is created:

- The accounting document of the goods issue creates a **debit** item on the **Costs of Goods Sold** account (780000) with the value of 570.000\$ which corresponds to the material price (product cost calculation) of 1140\$ times 500.
- The accounting document of the goods issue creates a corresponding **credit** item on the **Inventory Finished Goods** account (200100) with the same value. This credit posting documents that the value of Speedstarlett inventory in your company decreased by 570.000 \$ due to 500 Speedstarlets that left the stock.

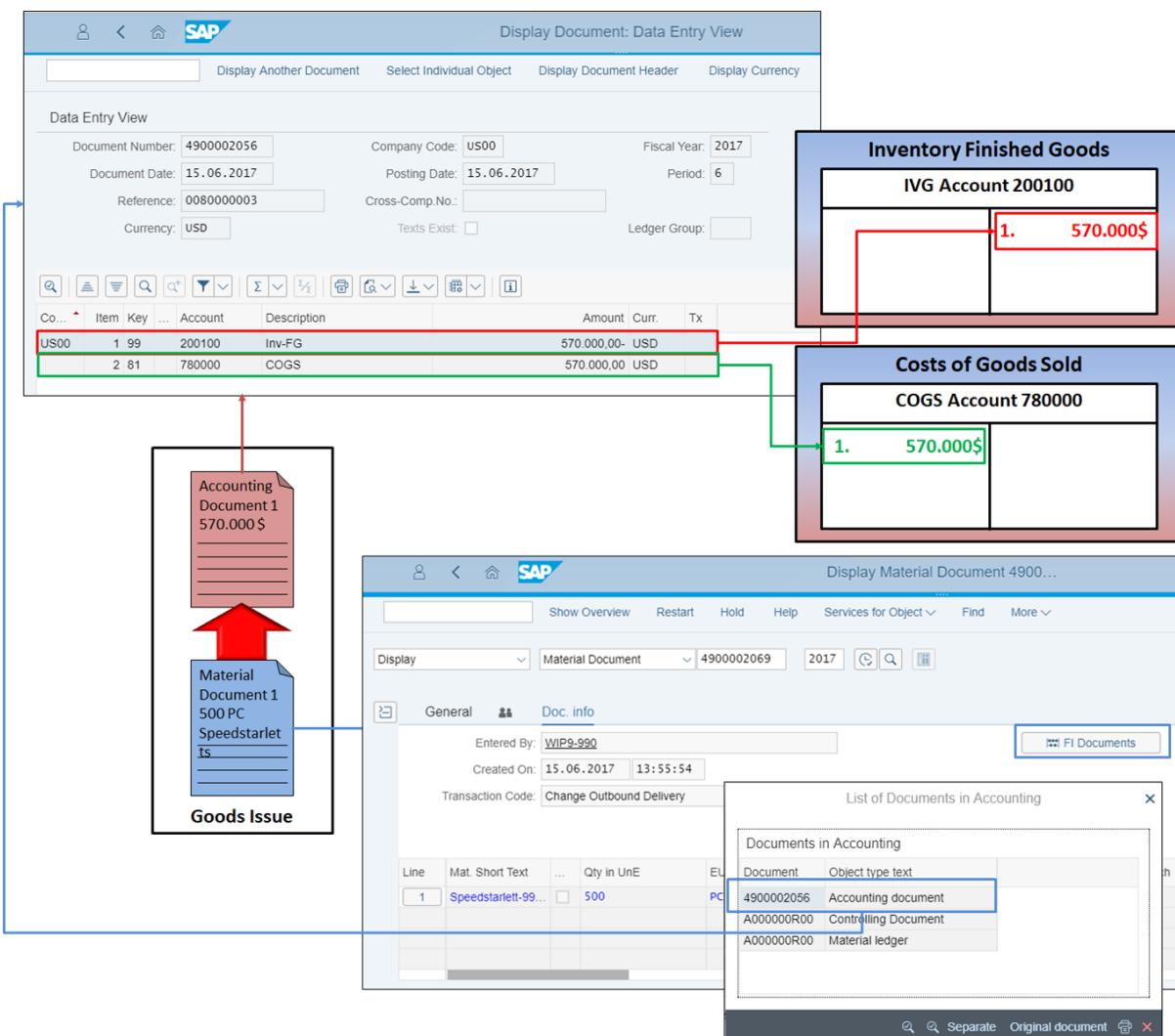


Figure 65: Integration with Financial Accounting: SAP-System-Screenshot

With the S/4HANA simplification efforts there is also now the native Fiori App *Material Document Overview* available, which allows a simplified view on material documents such as

goods issue postings. In this App, the document flow and the connection between goods issue, outbound delivery and accounting document is also represented graphically.

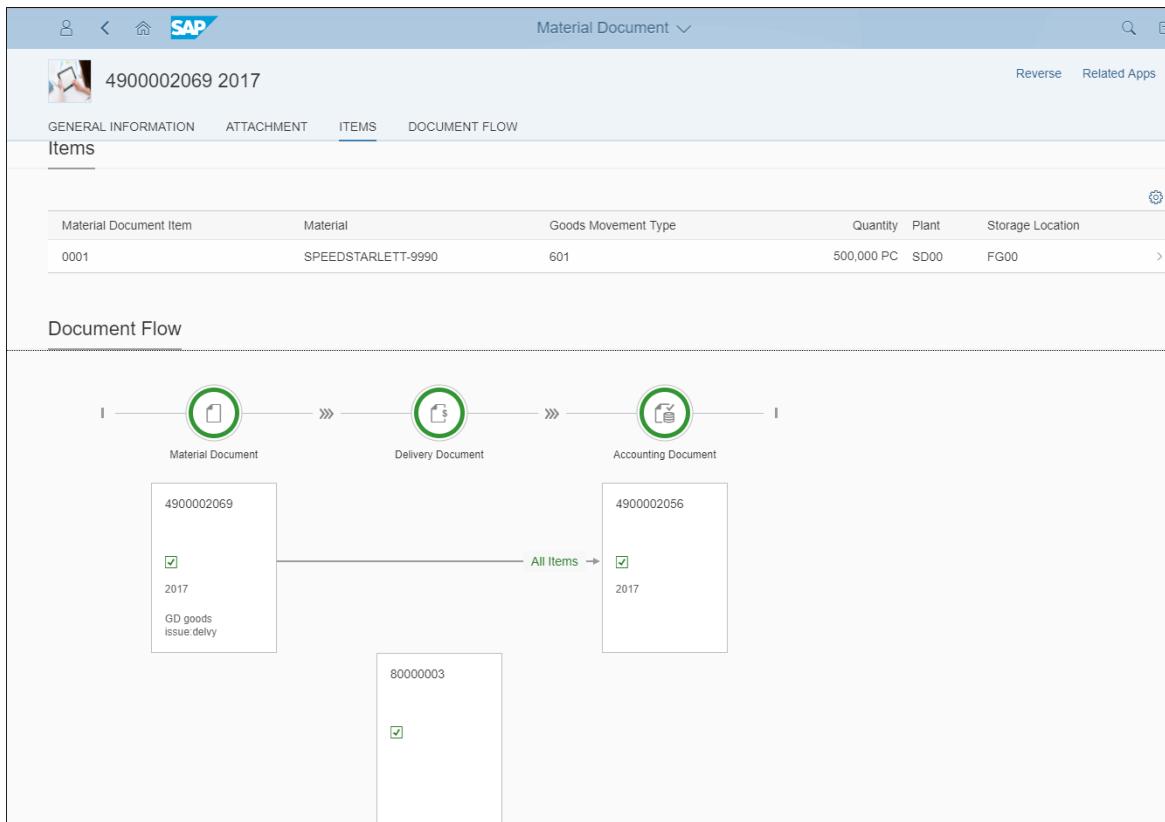


Figure 66: Material Document in native Fiori UX App: SAP-System-Screenshot

3.1.4 Billing Processing

After the goods issue posting, the shipping activities are completed and the customer can finally be billed. Once the goods issue is completed, no further (significant) activities can be performed in the outbound delivery document.

Billing is the final process step in the Lead-to-Cash business process that is carried out in the Sales and Distribution application. It is used to generate the customer invoice and will update the customer's credit status.

The billing document can – depending on the underlying process (order-based or delivery-based billing) – reference the sales order and/or the delivery document. All information that is required to create the billing is thereby copied from the sales order and/or delivery document into the billing document. Information on billing is available at every stage of order processing and delivery processing.

Within the billing component, the following functions are available:

- Creation of invoices based on deliveries or services
- Issue of credit and debit memos
- Creation of pro forma invoices
- Cancel billing transactions

- Comprehensive pricing functions
- Issue rebates
- Transfer billing data to Financial Accounting (FI)

3.1.4.1 Creating a Billing Document

A billing document is, generally, created with reference to a sales order (order-related billing) or to an outbound delivery document (deliver-based billing). Which method is used depends on the Customizing settings for the particular transaction types and item types of the sales order or delivery documents.

Invoices can be created in the SAP system either ***online*** in a dialog process or in the ***background*** in times of less system workload. When creating a billing document several options are available:

- **Background Job:** The system can process a billing due list automatically as a background job. Here, a job is defined that is run periodically (e.g. every night). The job processes all billing requests from the billing due list, check them for formal correctness and automatically sends the billing documents to the customers.
- **Dialog Process:**
 - o The responsible employee processes one or multiple billing documents manually from the billing due list (transaction VF04 or Fiori App *Create Billing Documents Work List*). Thereby, billing due list items (billing requests) can either be processed individually or collectively.
 - o The responsible employee creates one individual billing document explicitly for a sales order or outbound delivery (transaction VF01 or Fiori App *Manage Billing Documents*).

The billing due list is a so-called **work list** in the SAP system. Thereby, a worklist summarizes all objects that meet certain criteria and are waiting for further processing. With a worklist, an employee can access a list that contains all the documents that require processing with a particular subsequent function. On the one hand, worklists can be used like reports for information purposes in order to provide employees with an overview of open tasks. On the other hand, work lists can be used to process documents more efficiently as employees can directly access functions for individual processing of an item from the overview instead of calling up each work list item individually. In addition, employees can run certain functions collectively on multiple work list items, thus, having to execute the function only one time.

Work lists are available in different components. For instance, SAP provides work lists for:

- **Outbound deliveries:** When you execute the ***outbound delivery work list***, all open sales order items are displayed, for which no outbound delivery has been created yet. From this list, an employee can process one or multiple sales document items and create outbound deliveries for them.
- **Picking items:** When you execute the ***picking work list***, all open outbound delivery items are displayed, for which no transfer order has been created, yet. From this list, an employee can process one or multiple outbound delivery items and create transfer orders for picking those items.

- **Goods issue postings:** When you execute the ***goods issue work list***, all outbound delivery items are displayed, that are waiting for the goods issue posting (e.g. outbound delivery items that have already been picked and confirmed). From this list, an employee can process one or multiple outbound delivery items and post the goods issue for the transactions that have been successfully picked.
- **Billing list items:** When you execute the ***billing due work list***, all open sales order or outbound delivery items are displayed, for which no billing document has been created, yet. From this list, an employee can process one or multiple billing request items and create billing documents.

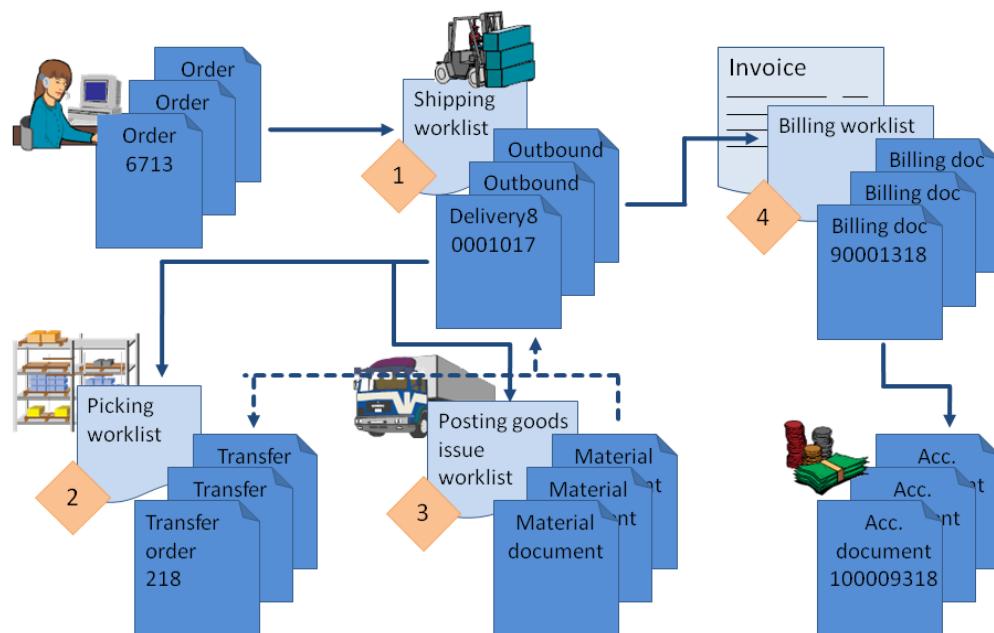


Figure 67: Worklists in SAP S/4HANA

In the course of creating billing documents the responsible employee can decide whether:

- Individual billing
- Collective billing
- Split billing

Individual Billing

You can create an individual billing document for every sales order/outbound delivery document. This is done in transaction VF01 by entering the outbound delivery or sales order number as reference for the billing. All sales order or outbound delivery items that are due for billing are transferred in an individual item of the billing document.

It is also possible to create individual billing documents from the billing due work list in transaction VF04 by marking the billing due list item and pressing the button *Individual Processing*.

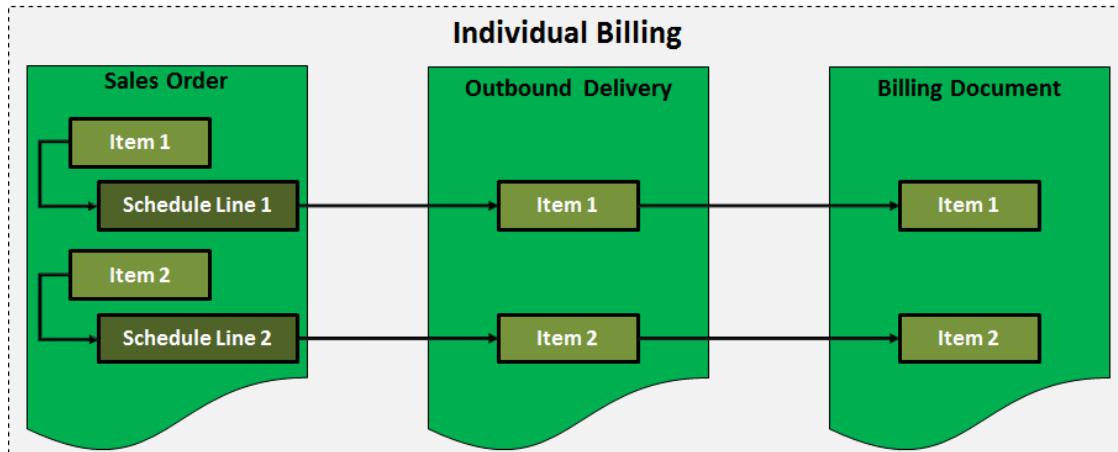


Figure 68: Individual Billing

Collective Billing

You can combine multiple sales orders or outbound deliveries into one collective billing document. In order to be able to group multiple different sales documents into one billing document several pre-requisites must be met. The following invoice characteristics must be equal for the sales documents that you want to merge into one billing document:

- payer (customer)
- billing date
- destination country

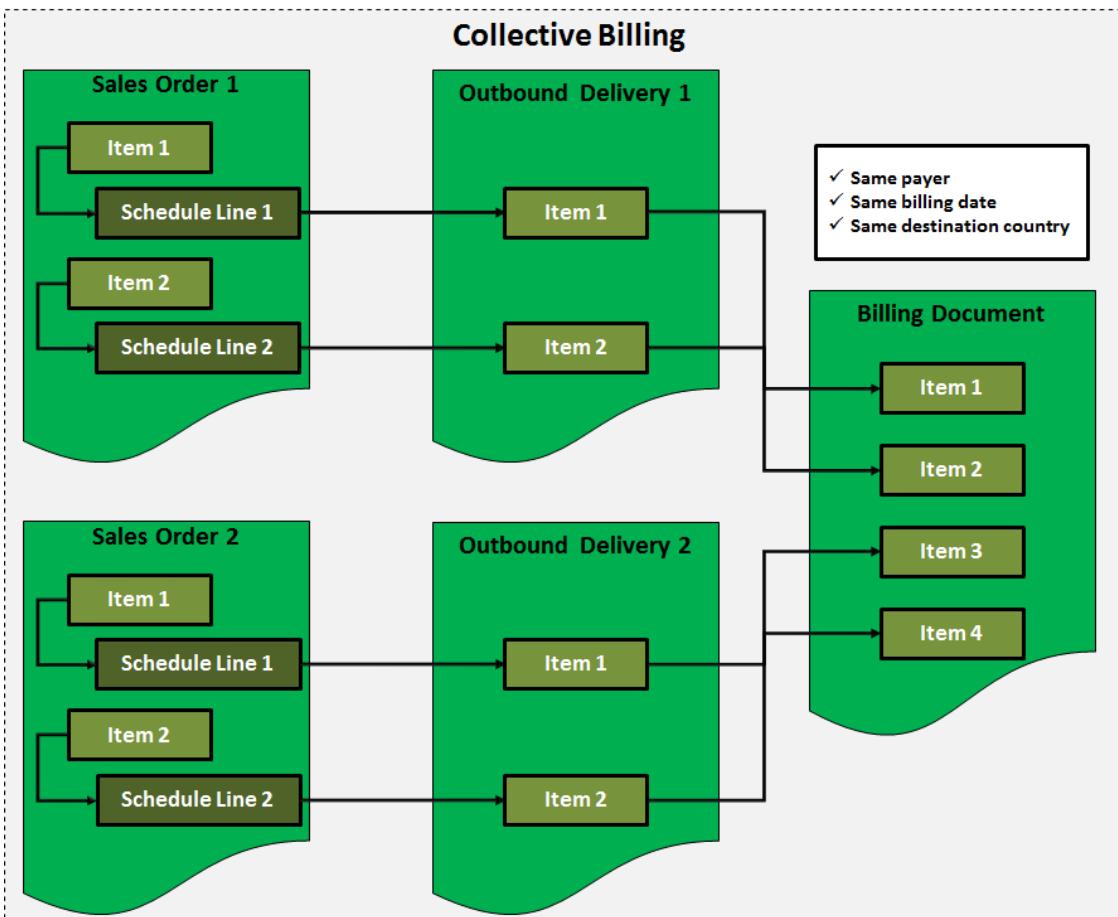


Figure 69: Collective Billing

Split Billing

In split billing, you process items of one or several sales documents with several billing documents. This is, generally, used when you want to send partial invoices, e.g. for project phases that already have been accomplished.

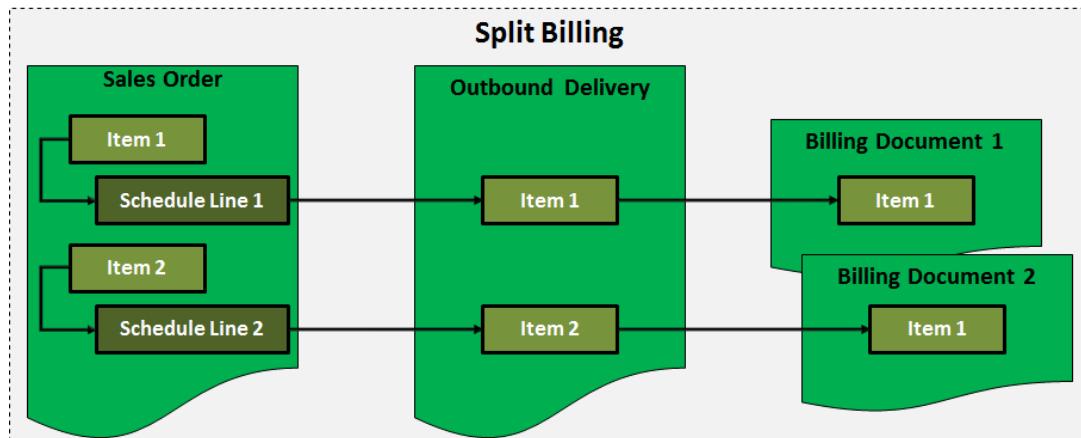


Figure 70: Split Billing

3.1.4.2 Billing Document Structure

A billing document in the SAP system can be an invoice, a credit memo, a debit memo, a pro forma invoice, or a cancellation document. All these billing document types have the same structure. They consist of a document **header** and can have multiple **items**.

The header contains general data that is valid for the entire billing document. This includes data such as:

- Identification number of the payer (customer ID)
- Billing date
- Net value of the entire billing document
- Document currency
- Terms of payment and Incoterms
- Partner numbers, such as the identification number of the sold-to party
- Pricing elements
- Items

The items area contains the data for each individual item. Here the following data is depicted:

- Material number
- Billing quantity
- Net value of the individual items
- Weight and volume
- Number of the reference document for the billing document (e.g., the referenced delivery or sales order)
- Pricing elements relevant for the individual items

For the efficient processing of billing documents, data is displayed in different views on multiple tabs. The views are grouped in overview, header and item screens. The following figure displays the header and item area of a billing document:

Condition type	Name	Amount	Currency	Pricing ...	Condition Unit	Basis Value	Condition ...	Value	Document ...	Changed Manually
PR00	Price	2.200,00	USD			500	PC	1.100.000,00	USD	
	Gross Value	0,00	USD			0,00	USD	1.100.000,00	USD	
	Discount Amount	0,00	USD			0,00	USD	0,00	USD	
	Rebate Basis	0,00	USD			0,00	USD	1.100.000,00	USD	
	Net Value for Item	0,00	USD			0,00	USD	1.100.000,00	USD	
	Net Value 2	0,00	USD			0,00	USD	1.100.000,00	USD	
	Total	0,00	USD			0,00	USD	1.100.000,00	USD	
SKT0	Cash Discount	0,000	%			1.100.000,00	USD	0,00	USD	
VPRS	Internal price	1.140,00	USD			500	PC	570.000,00	USD	
	Standard - USA /With	0,00	USD			0,00	USD	530.000,00	USD	

Figure 71: Billing Document Structure: SAP-System-Screenshot

3.1.4.3 Effects of a Billing Document

When a billing document is saved, the system automatically performs a series of updates and creates several documents required for accounting.

The following postings are always carried out in SAP FI automatically, when a billing document is saved:

- A **credit** posting to the *Sales Revenue account*
- A **debit** posting on the *customer account* in the sub-ledger Accounts Receivables (FI-AR) and in the *receivables* in the General Ledger (FI-GL)

The accounting document that is created for these postings, records all the value changes that refers to pricing in Sales and Distribution. For example, receivables on the customer account or the obtained net sales and taxes on the respective G/L accounts.

In addition, depending on the components that are implemented and active in the SAP system, the following documents might be created:

- In Controlling, a controlling document updates costs for components sold and Profitability Analysis (CO-PA)
- An accounting document could update data for the financial statement in the SAP FI Consolidation System (FI-LC).

Finally, saving the billing document, leads to a series of document updates in the system:

- the statuses in all related sales, delivery, and billing documents in the document flow are updated
- sales statistics (revenues) are updated in the Sales Information System (SIS)
- the customer's credit account segment in Credit Management is updated

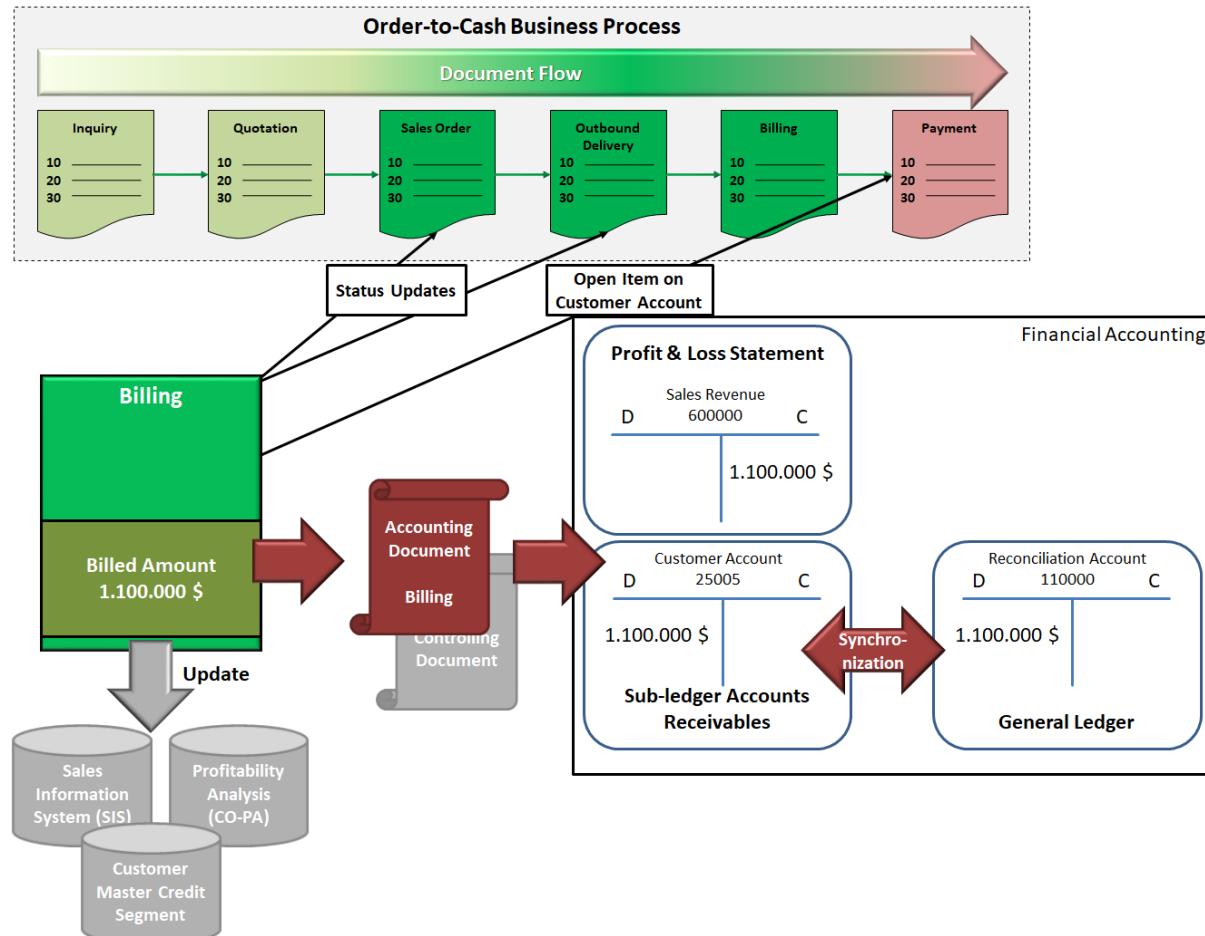


Figure 72: Effects of a Billing Document

3.1.4.4 Elucidation: Billing Integration with Financial Accounting (FI)



ELUCIDATION

As already mentioned previously, each billing posting creates an accounting document along with the billing document. The accounting document posts the value changes to the corresponding accounts in Financial Accounting (SAP FI). The accounting document of the billing document leads to the following Financial Accounting (SAP FI) entries in the SAP system:

- A **credit** posting to **Sales Revenue** account. This posting document the revenues the company expects from this sales process and is recorded in the Profit and Loss Statement.
- A **debit** posting on the **customer account** in the sub-ledger FI-AR and simultaneously on the General Ledger (FI-GL) account for **receivables (reconciliation account for accounts receivables)**. This posting document the amount of money the customer owes your company and depicts an open item on the customer account that needs to be cleared with the customer payment.

Example:

You have shipped the materials that the customer had ordered, to the customer and sent the billing document (Invoice: 1.100.000\$). As you can see from the following figure, the invoice (billing document) results in the creation of an accounting document that records the following accounting processes:

- The accounting document of the billing process creates a **credit** item (Invoice: 1.100.000\$) on the **Sales Revenue** account (600000) in the Profit and Loss Statement.
- The accounting document of the billing process creates a **debit** item (1.100.000\$) on the **customer account** (25005) in the sub-ledger FI-AR. The balance (1.100.000\$) of the customer account in the sub-ledger is synchronized with the **reconciliation account** for accounts receivables in the General Ledger (110000).

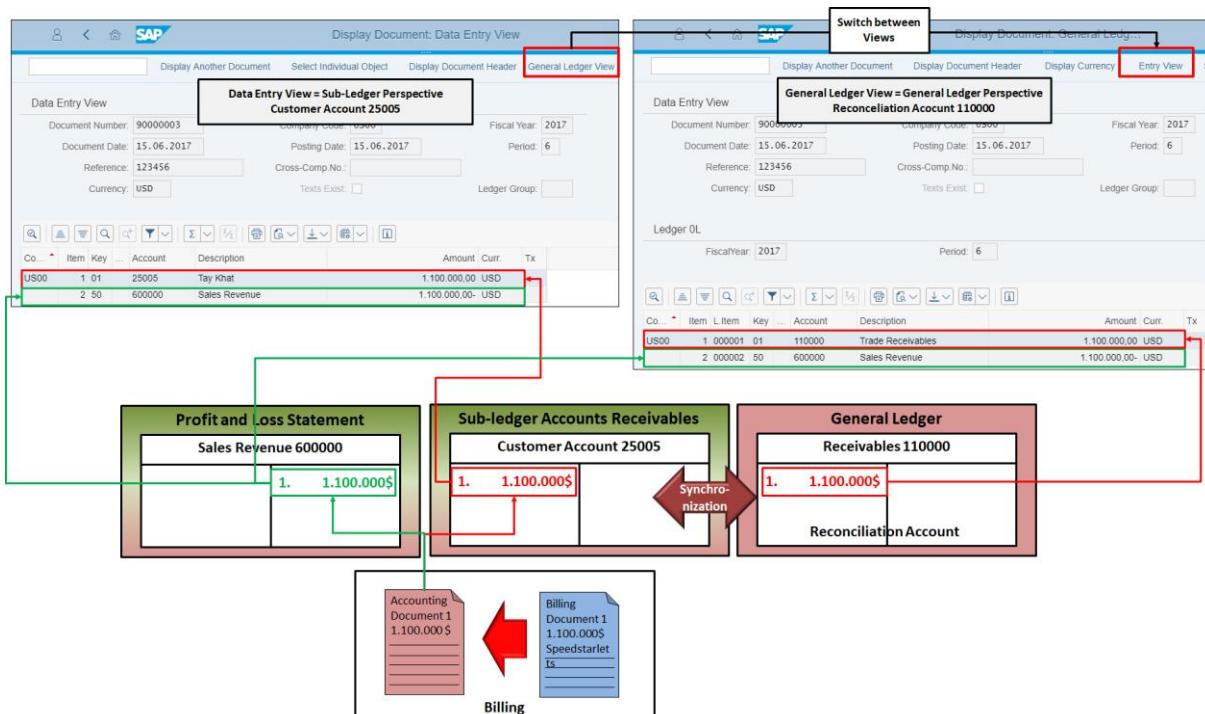


Figure 73: Integration with Financial Accounting: SAP-System-Screenshot

Same as with the vendor invoice in the Purchase-to-Pay business process, you should consider the following. The entry on the customer account and the entry on the reconciliation account refer both to the same posting but from two different perspectives: Sub-ledger FI-AR vs. General Ledger FI-GL. The value of the posting is debited only once in the books.

In an accounting document that involves a sub-ledger such as accounts receivables (customers) or accounts payables (vendors), there is always

- a **data entry view** that shows the posting from the point of view of the sub-ledger and contains the sub-ledger accounts (e.g. customer accounts) and the
- a **general ledger view** that shows the same posting from the point of view of the General Ledger and contains the reconciliation account

The figure above illustrates this using the example from our sales order process:

- In the **data entry view** the posting credits Sales Revenue 600000 with 1.100.000\$ and debits **customer account 25005** in the sub-ledger FI-AR with 1.100.000\$

- In the **general ledger** view the posting credits Sales Revenue 600000 with 1.100.000\$ and debits **reconciliation account 110000** in the General Ledger with 1.100.000\$

With the S/4HANA simplification efforts there is also now the native Fiori App *Manage Journal Entries* available, which allows a simplified view on accounting documents created for any journal posting. In this App, all information regarding the General Ledger (leading ledger) posting is displayed in condensed form. This new document display functionality also contains information on all related documents in the business process, thus, allowing a view at the end-to-end-process document flow even from within accounting documents.

The screenshot shows the SAP Fiori interface for managing journal entries. At the top, it displays a journal entry (90000003) in 'Entry View'. Below the header, there are sections for 'Header Information' (posting details like date, company code, reference), 'Related Documents' (a table listing various document types like Billing Document, Outbound Delivery Document, Transfer Order, and Sales Order), and 'Document Items' (a table showing line items for G/L Account 110000 (Trade Receivables) and 600000 (Sales Revenue)). A red box highlights the 'Related Documents' section, and another red box highlights the 'Document Items' section. A third red box highlights the entire main content area. At the bottom, a detailed view of 'Item 1 of 2 (90000003)' is shown, including 'General Data' (posting key, customer, G/L account), 'Payment Transaction' (payment reference), 'Payment Terms' (discount base, baseline date), and 'Account Assignment' (company code, controlling area).

Figure 74: Accounting Document in native Fiori UX App: SAP-System-Screenshot

3.1.5 Elucidation: Customer Payment

 **ELUCIDATION**

The billing document creation is the data source for Financial Accounting (FI) regarding monitoring and processing of incoming payments. The payment step is the last step of the Lead-to-Cash process. However, the payment is carried out in the Financial Accounting application and, thus, is not part of the Sales and Distribution application. We will discuss this step nevertheless at this point for the sake of completeness.

This final step includes a posting payment against the customer invoice (customer account) and reconciling of potential differences between payment and invoice, if for instance payment term discounts have been granted (e.g., 3% off the price if paying within 3 days). The payment will create a posting that clears the receivables in the sub-ledger Accounts Receivable account (customer account) and increases the amount on the company's bank account.

3.1.5.1 Effects of the Customer Payment

As you have learned in the previous chapter, the customer invoice leads to the following Financial Accounting (SAP FI) entries in the SAP system:

- A credit posting to the sales revenue account
- A debit posting on the customer account in SAP FI-AR sub-ledger and the corresponding posting on the reconciliation account in the General Ledger (receivables)

The later creates an open item in SAP FI-AR and SAP FI-GL and needs to be cleared with the customer payment. At this point, note that payments of a customer can be posted **against the customer account** or **against individual open items** on the customer account. If you want to pay a certain sales order with a payment, then you must enter the corresponding billing number as reference into the payment transaction.

When receiving the customer payment and creating the payment document the system completes the following postings that are documented in an accounting document:

- a debit posting to the cash account (bank)
- a credit memo to the customer (FI-AR)/receivables (FI-GL) account, which clears the previously created open item on the customer account due to the billing document posting.

In addition to the creation of the accounting document, the status of the Lead-to-Cash business process (document flow) is updated a last time. In this case, the accounting document that was created due to the posting of the billing document changes its status from open to **cleared**.

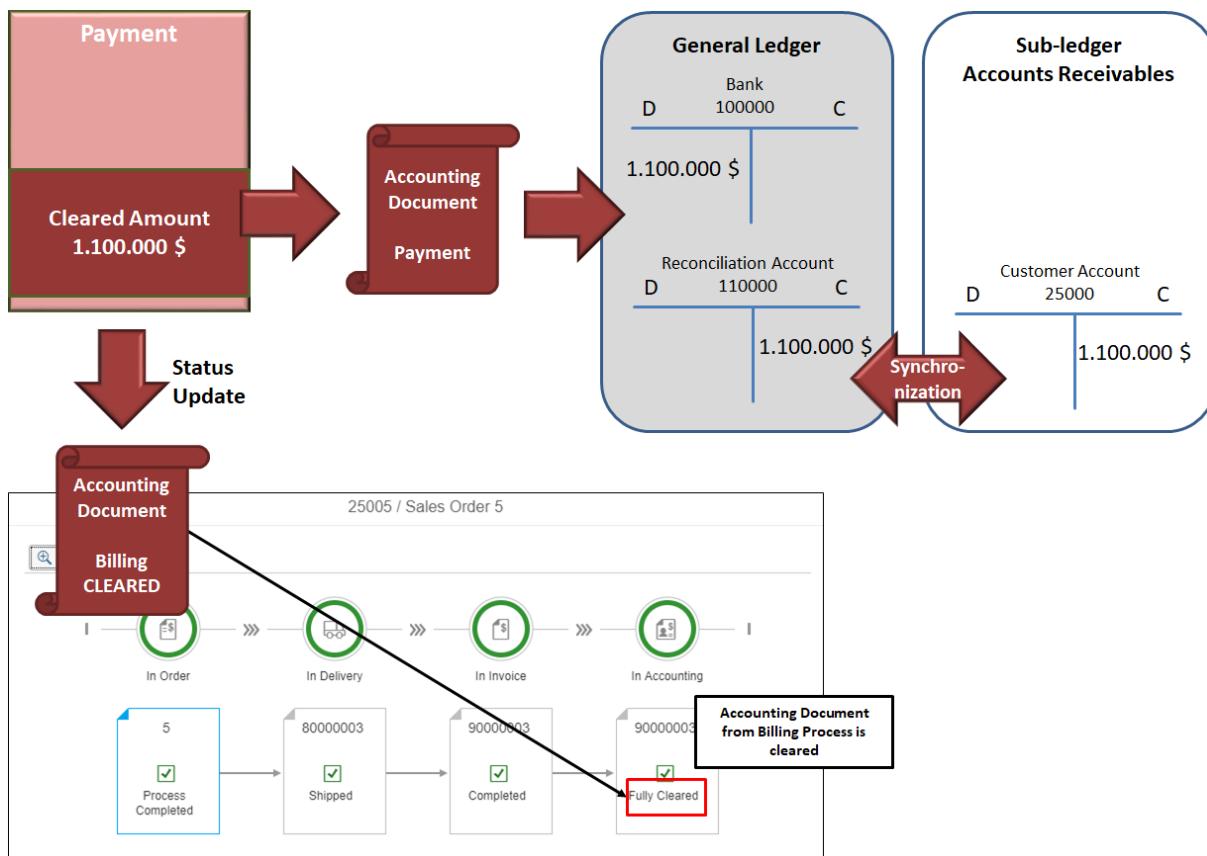


Figure 75: Customer Payments: SAP-System-Screenshot

3.1.5.2 Customer Payment Integration with Financial Accounting (FI)

The following figure illustrates the posting of the customer payment using our example sales process:

- The customer payment **credits** the customer account 25005 in the sub-ledger FI-AR and the reconciliation account 110000 (Trade Receivables) in the General Ledger at the same time with the amount of 1.100.000\$. This posting clears the previously open debit posting from the billing document.
- The customer payment **debites** the company's bank account 100000 in the General Ledger. This posting documents that the company's bank account has increased by 1.100.000\$.

Again, consider that the posting to the customer account in the sub-ledger FI-AR and the posting to the reconciliation account in the General Ledger are only two perspectives on the same booking process.



NOTE

*Note that the bank accounts (here: 100000) in the SAP system are mapped to real-world banking accounts that are synchronized with the SAP system using the **Account Statement**. We have described the process of Account Statements already in the Purchase-to-Pay business process.*

Enterprise Resource Planning with SAP S/4HANA

Script 3: Lead-to-Cash Business Process

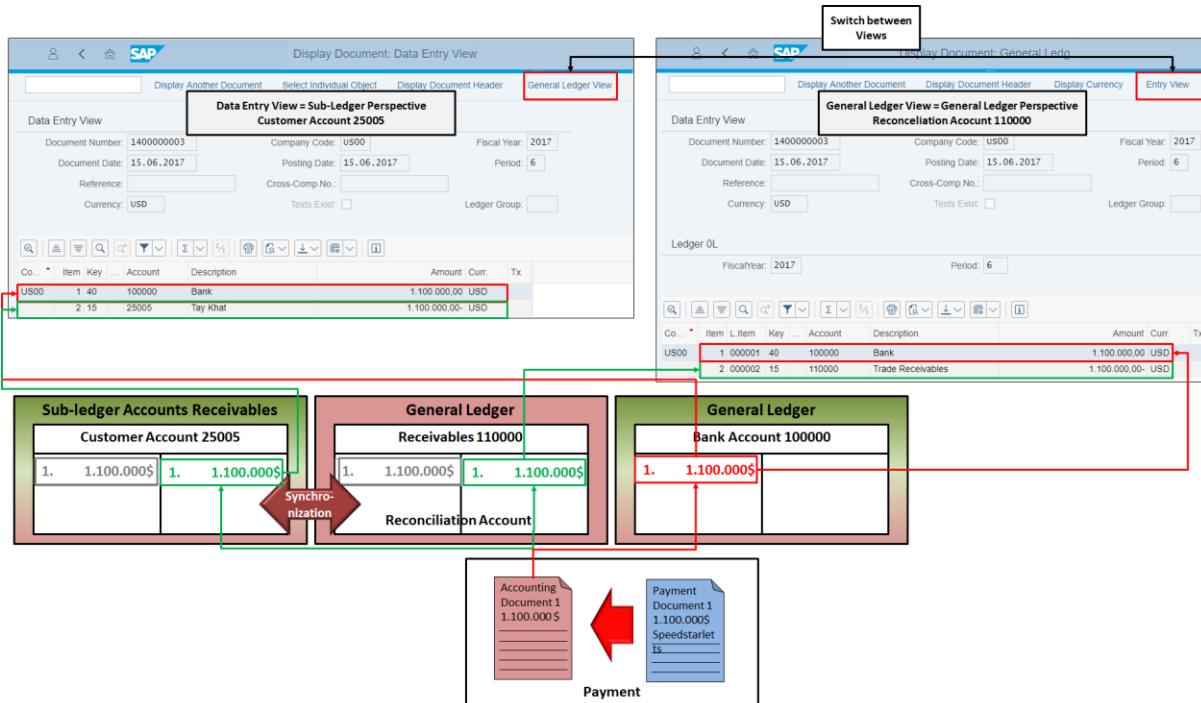


Figure 76: Customer Payments: SAP-System-Screenshot

3.2 Theory: Warehouse Management



THEORY

Companies that require a comprehensive warehouse concept and transport management with exact coordinates, quantities and availability of materials within their warehouse and storage locations as well as monitoring material movements and how they are transported between different storage areas for both: inbound delivery processes as well as outbound delivery processes, must implement advanced warehouse functions that go beyond standard Material Management and Inventory Management functionalities of S/4HANA.

3.2.1 Overview of Warehouse Management

Depending on the business activity of a company and the number and variety of products, the requirements for a warehouse management system can vary greatly. Companies that only produce and sell individual products (e.g., mining companies that extract raw materials) get by with simple warehouse management and do not need a warehouse management system. Large trading companies (such as Amazon), on the other hand, which offer thousands of products from many manufacturers and sell these products to millions of customers, have a large network of complex warehouses that have to fulfil a.o., the following tasks:

- Exact tracking of the products received
- Exact determination of the locations to store incoming products
- Exact tracking of current stocks for each product
- Exact determination of the locations from which the product is to be collected (before this product is distributed)
- Exact tracking of the products being distributed

Warehouse management means the management of stocks and the management of the exact locations in and within the various warehouses where these stocks are stored. In order for a company to be able to fulfil customer orders – despite the difficulties of exact forecasts of new customer demands – without delay, sufficient stocks must be kept available for order fulfilment without losing sight of the costs of warehousing. These days, manufacturing companies, in particular, use a just-in-time model in which only as little stock is kept as is necessary for short-term production. This results in an optimization problem with target conflicts between reduced storage costs and production losses due to insufficient stocks.

A comprehensive warehouse management system must therefore be able to store stocks efficiently, on the one hand, to be able to fulfil customer orders on time and to supply production with raw materials. On the other hand, it has to record the exact stock situation at all times and anticipate critical situations and provide solutions.

When a company has a large and complex warehouse with many storage bins and many different goods and materials, it needs a warehouse management system to operate efficiently and to meet customer needs. A warehouse management system (WMS) must provide the following functionalities to ensure high storage efficiency:

- A WMS must provide tools for monitoring all warehouse activities and for planning resource requirements (e.g., warehouse staff or resources)
- The quantity of a material must be tracked in the warehouse at all times

- Every location of every storage bin that contains a certain material must be tracked in the warehouse at all times
- All goods and material movements in the warehouse must be monitored and documented at all times:
 - o The storage of materials that enter the warehouse must be monitored. The warehouse management system determines an available and suitable storage location to store the materials.
 - o The picking of materials that leave the warehouse must be monitored. The warehouse management system determines a suitable storage location where the material is available and from which the material is picked.

In more complex warehouses, additional functions can be provided to manage additional information or services for goods and materials. Examples for this are:

- serial numbers
- batch numbers
- Minimum shelf life of perishable goods
- Yard management, control of all activities on the factory premises, e.g. the management of the company's own vehicles and third-party vehicles (freight forwarders)
- Vendor Managed Inventory (VMI), stocks that are managed by the company's suppliers
- Value Added Services (VAS), e.g., packaging

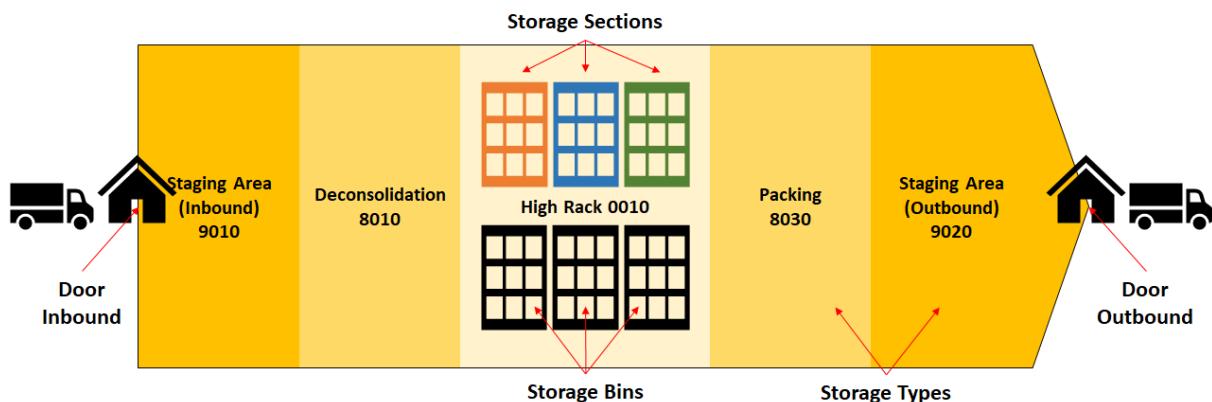


Figure 77: Warehouse Processes in SAP EWM

3.2.2 SAP Warehouse Management Solutions

SAP provides several solutions for Warehouse Management (WM) from Lean-WM in the Logistics Execution (LE) application up to Extended Warehouse Management (EWM) as decentralized or integrated application. This enables customers to select the solution they need for their business scenario or for each of their warehouses separately.

3.2.2.1 SAP Warehouse Management Solutions

The following figure illustrates the development of the Warehouse Management applications provided by SAP:

- “No Warehouse Management”
- Lean Warehouse Management
- SAP ERP Warehouse Management

- Decentralized Warehouse Management
- SAP ERP Extended Warehouse Management
- SAP SCM Extended Warehouse Management

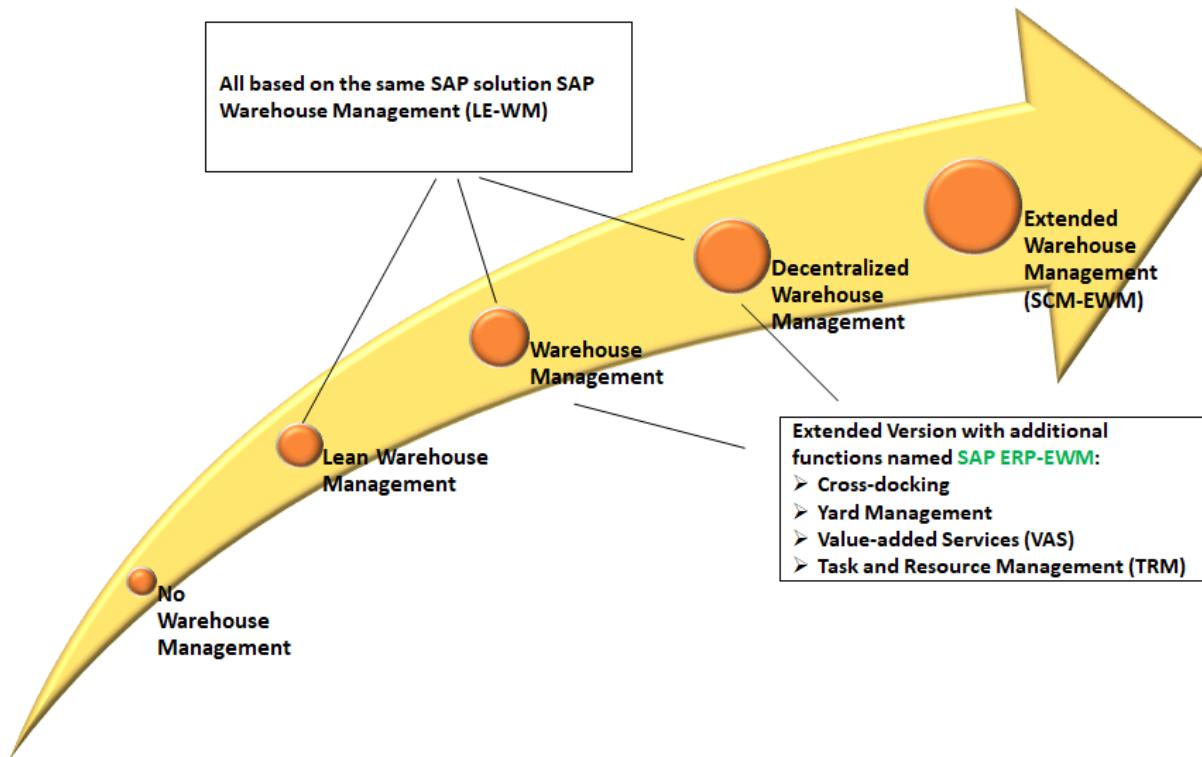


Figure 78: SAP Warehouse Management Solutions

3.2.2.1.1 No Warehouse Management

If for a company it is sufficient to control stocks on plant-storage-location-level and monitor goods movements based on goods receipt and goods issue postings, then no specific warehouse management solution is required. SAP Material Management (MM) and its subcomponent Inventory Management (MM-IM), which are integral part of SAP solutions since R/2, provide all necessary functionalities.

3.2.2.1.2 SAP ERP Warehouse Management

In 1993, SAP Warehouse Management (LE-WM) was developed as a subcomponent of the Logistics Execution (LE) application in SAP R/3 (version 2.0). Since its first release, SAP has continuously improved and extended this application to provide increased functionality and satisfy customer requirements. The main functions of Warehouse Management are:

- Management of inventory at the level of storage bins
- Mapping and control of all goods movements using transfer orders
- Monitoring the processing of all goods movements (using Warehouse Activity Monitor)
- Connection to mobile data entry as part of integrated radio frequency solution
- Connection to specialized external systems (e.g., an automated warehouse system) using an interface

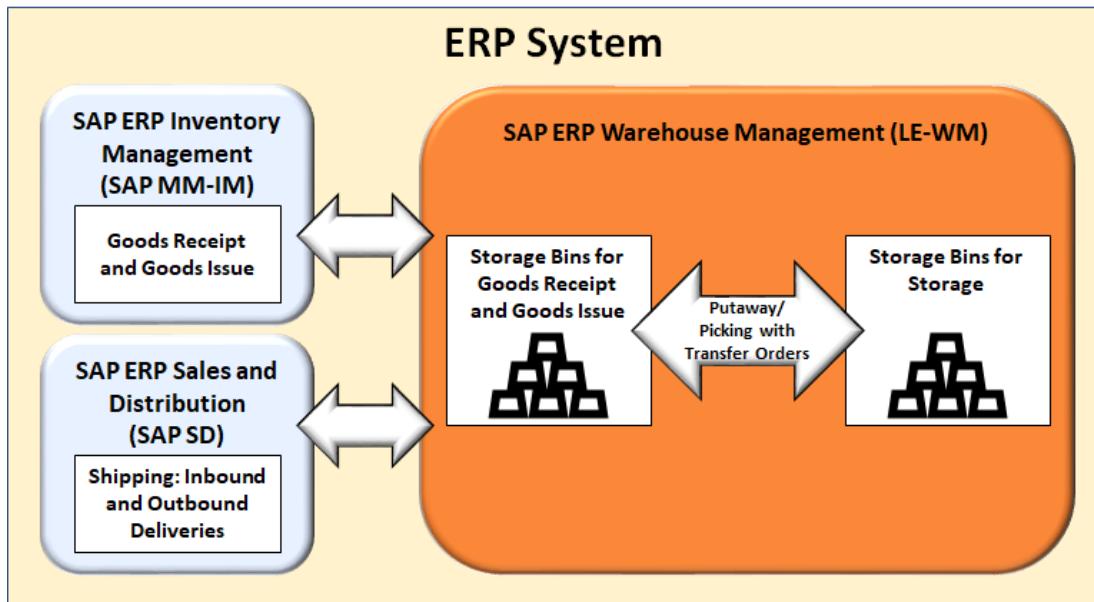


Figure 79: SAP ERP Warehouse Management (LE-WM) (SAP Online Library)

3.2.2.1.2.1 Lean Warehouse Management

With Lean Warehouse Management (Lean WM), SAP offers a simplified version of the Warehouse Management application in SAP ERP. This version does not manage inventory on the level of storage bins and is meant for companies for which a fixed bin strategy is sufficient or which use a third-party warehouse management solution and only need Lean WM to integrate SAP ERP with that external solution.

3.2.2.1.2.2 SAP ERP Decentralized Warehouse Management

Companies for which smooth operation in warehouse management is crucial – especially in warehouses with a high throughput – require a stable warehouse management system with quick response times, 24/7 availability and low risk of downtime (regardless of availability of other systems) to ensure that the WMS can perform all logistics processes, which are often closely integrated.

One way to achieve this, is to install the warehouse management system on a separate server than the ERP system. This ensures that no performance problems arise due to heavy load on the operative ERP system. By implementing the Warehouse Management application as an independent, decentralized SAP system, which is logically and physically separated from the ERP system, it can receive requests for goods movements from any ERP system and process all warehouse related activities (e.g., picking, packing, transportation) only using its own resources.

In this decentralized WM scenario, the collaboration with the ERP system (e.g., SAP ERP) works as follows:

- The regular logistical business processes, such as sales order management or creation of purchases orders, and the corresponding deliveries are performed in the ERP system.
- Warehouse-specific processes, such as goods receipt, storage, goods issue, and monitoring warehouse activities are performed by the decentralized WM.

Note that the decentralized WM system is basically an SAP ERP system which only has the LE-WM application implemented but uses the same basis (NetWeaver) and cross-application

components. The communication between the two “ERP”-systems is achieved using Business Application Programming Interfaces (BAPIs):

- In the SAP ERP system, inbound and outbound deliveries for incoming and outgoing goods are created and then replicated via corresponding BAPIs to the decentralized WM system.
- Once a goods movement is finalized or “posted” in the decentralized WM, it is replicated back via BAPIs to the SAP ERP system and updates the status of the involved process documents (e.g., sales order status).

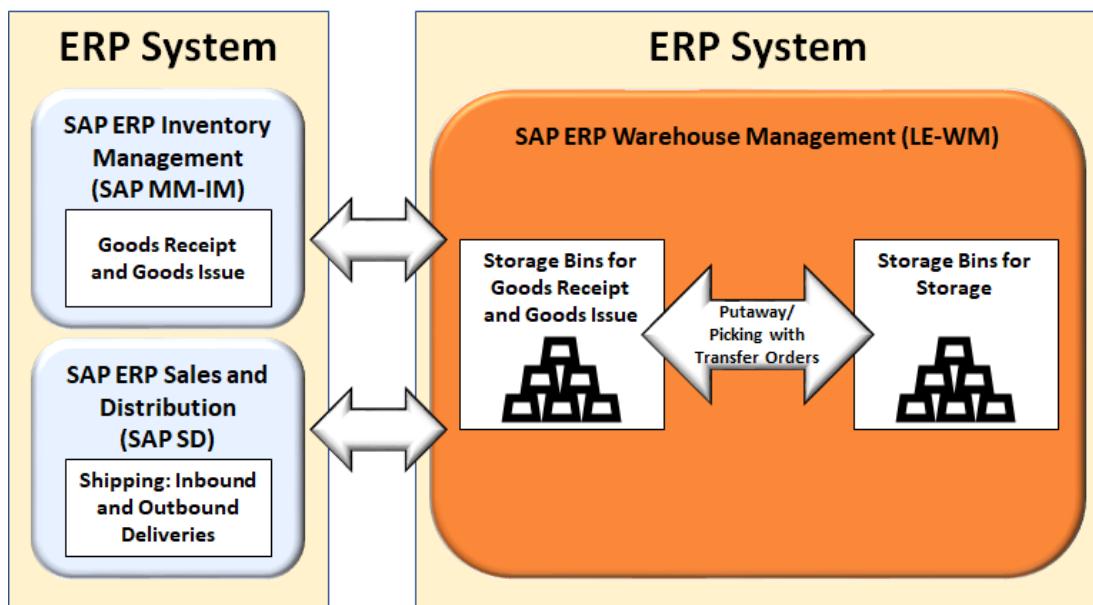


Figure 80: SAP ERP Decentralized Warehouse Management (SAP Online Library)

3.2.2.1.2.3 SAP ERP Extended Warehouse Management

With the release of SAP R/3 Enterprise Extension Set 2.0 the basic functions of the LE-WM application were extended by the functionalities *Yard Management*, *Cross-docking*, *Value Added Services (VAS)* as well as *Task and Resource Management (TRM)*.

The bundle of classic LE-WM and the extended functionalities was referred to as SAP ERP Extended Warehouse Management (EWM). Note that this solution is not the same as the SAP SCM (Supply Chain Management) solution EWM.

3.2.2.1.3 SAP SCM Extended Warehouse Management

In 2005, SAP introduced the Service Parts Management (SPM) solution of which Extended Warehouse Management (EWM) was an integral component. This EWM application was continuously developed and enhanced and eventually became part of the SAP SCM (Supply Chain Management) system. Today, EWM does not require any connection to SPM and can even be implemented as a standalone application (independently from SCM) to be used in any warehousing environment. Consequently, from an ERP perspective, SCM-EWM is a decentralized WM solution, which means that inbound and outbound deliveries are mandatory.

3.2.2.1.3.1 Features of SAP SCM-EWM

The **central functions** provided by SCM-EWM are:

- Inventory management at storage bin level
- Storage bin determination for incoming goods
- Stock removal for outgoing goods
- Stock transfers
- Physical inventory management

In addition to these central functions, **multiple enhancements** have been added over the years to improve warehouse management:

- Slotting
- Consolidation and deconsolidation
- Cross-docking
- Yard management
- Complex internal routing
- Value Added Services (VAS)
- Labor management
- Radio frequency Identification
- Kit-to-stock / Kit-to-order

With the warehouse management monitor, SCM-EWM provides a powerful tool that supports the following tasks:

- Supervising and dealing with warehousing documents and processes
- Checking stock and storage bins
- Monitoring employees
- Checking the warehouse workload
- Supervising the material flow system (MFS)

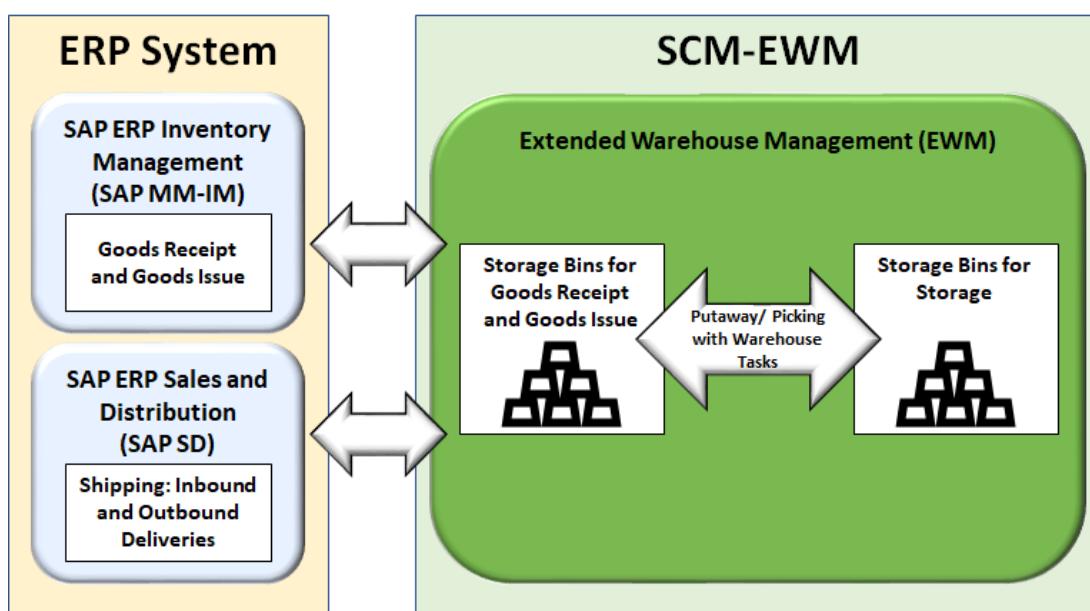


Figure 81: SAP SCM Extended Warehouse Management (SAP Online Library)

3.2.2.1.3.2 Comparison between SAP SCM-EWM and classic SAP WM Solution

The classic SAP Warehouse Management solution (WM) already provided a wide range of warehouse management functionalities. SAP SCM-EWM offers the same basic processes, but

greatly exceeds the WM scope. The following figure illustrates a comparison between the functions and features of SAP SCM-EWM and the classic SAP WM.

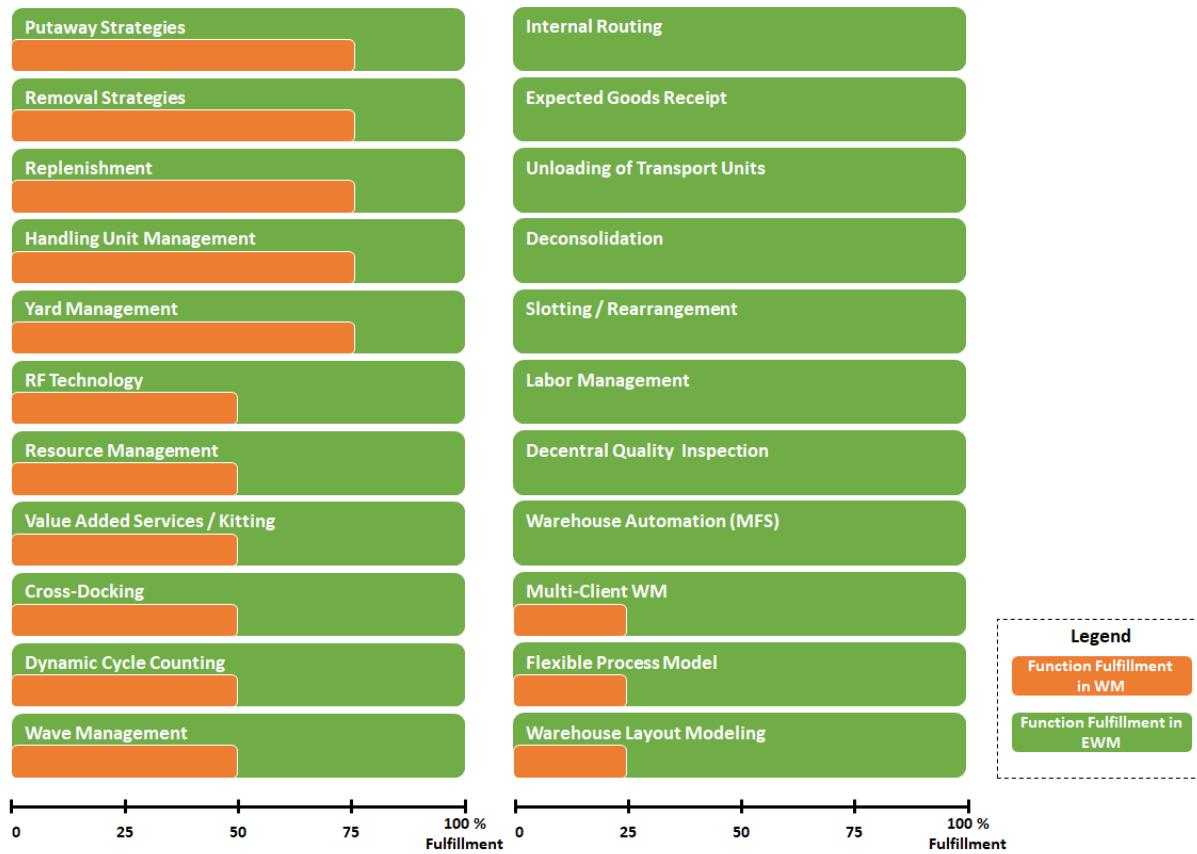


Figure 82: Comparison of SAP SCM-EWM and SAP WM Functions

One significant difference between the classic SAP WM and the SAP SCM-EWM system is that the WM system concentrates on internal warehouse functions, whereas there is only little functionality (e.g., contract packaging or transportation) that provides a link to external warehouse processes and integrates the entire supply chain.

The main reasons for implementing EWM, are

- reducing costs through better process efficiency and transparency as well as higher warehouse productivity
- the usage of the advanced features of EWM.
- Higher flexibility, customer-specific settings and a quick implementation approach
- High integration with other SAP solutions allows direct connection to Material Flow systems (MFS), easy fit into existing system landscapes (especially when EWM is embedded in SAP S/4HANA)

The classic SAP ERP Warehouse Management (LE-WM) application remains a viable alternative for many warehouses and business scenarios. SAP SCM-EWM does not replace the classic SAP WM system but provides an alternative for warehouses that require the additional functionality available in SCM-EWM. For instance, an SAP customer can implement SAP WM in some of its warehouses and SAP EWM in other warehouses in its enterprise.

In the following, the term EWM will only refer to the SCM-based EWM and not the extended version of the classic ERP-based WM.

3.2.2.2 SAP EWM in SAP S/4HANA

Before the release of SAP S/4HANA 1610, SAP EWM was only available either as a decentralized environment or as an Add-on for SAP ERP. As of release 1610, SAP EWM has been **embedded into S/4HANA** (SAP S/4HANA EWM) to provide a best-in-class warehouse management application covering complex warehouse processes across the whole supply chain and provides support with, as well as real-time transparency into, managing product movements in warehouse and ensures optimized warehouse operations. It offers a highly customizable process configuration and supports the direct integration to fully automated warehouses.

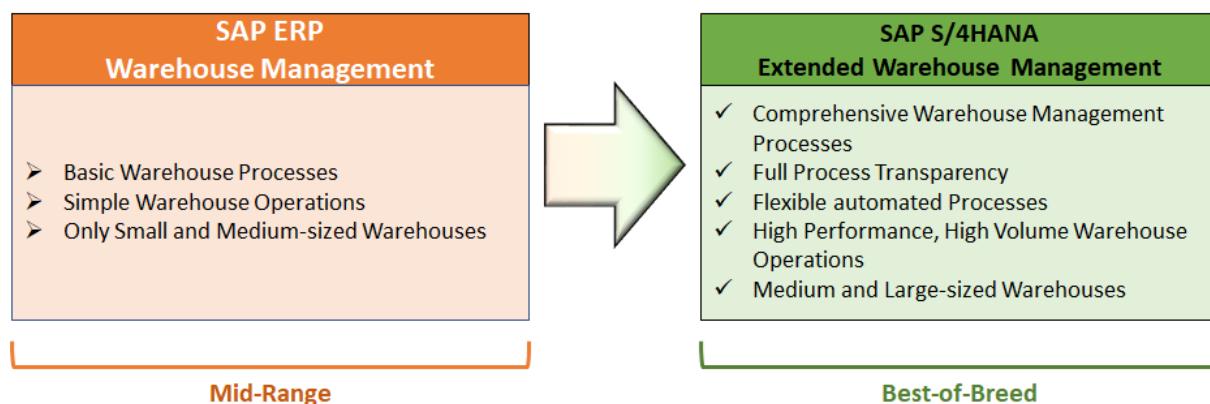


Figure 83: Comparison of SAP S/4HANA-EWM and SAP WM (www.sap.com)

3.2.2.2.1 Functional Scope of SAP EWM in SAP S/4HANA

The **basic EWM functionalities** are part of the SAP S/4HANA license and cover Inventory and basic Warehouse Management. They enable warehouse employees to execute goods issue and goods receipt activities within the warehouse, as well as flexibly plan and coordinate these activities. Basic warehouse management supports the following processes:

- Warehouse Structure
- Inventory Management
- Handling Units
- Inbound Processing
- Outbound Processing
- Internal Warehouse Movements
- Physical Inventory
- Reporting
- Resource Management
- Quality Management
- Production Integration

The **advanced EWM functionalities** in S/4HANA require an additional product license. They enable warehouse employees to optimize the goods issue and goods receipt activities in the warehouse, as well as flexibly plan and coordinate these activities. Advanced warehouse management supports the following processes:

- Inventory Management Optimization
- Inbound Process Optimization
- Outbound Process Optimization
- Material Flow Control
- Yard Management
- Labor Management
- Value Added Services
- Kitting
- Cross Docking
- Warehouse Billing
- Cartonization Planning
- SAP Dock Appointment Scheduling
- Shipping and Receiving
- Transit Warehousing

3.2.2.2 SAP EWM System Environment and Deployment Options

With SAP S/4HANA, SAP EWM became an integral part (embedded) of the S/4HANA solution and is designed to run as part of the SAP S/4HANA manufacturing core, allowing to run all warehouse management activities on the same system.

However, if required, it is also possible and fully supported by the SAP EWM solution to implement it in a decentralized environment connected to the SAP S/4HANA system. Whether to use SAP EWM as a decentralized implementation or as part of S/4HANA, depends on performance considerations and the system landscape setup.

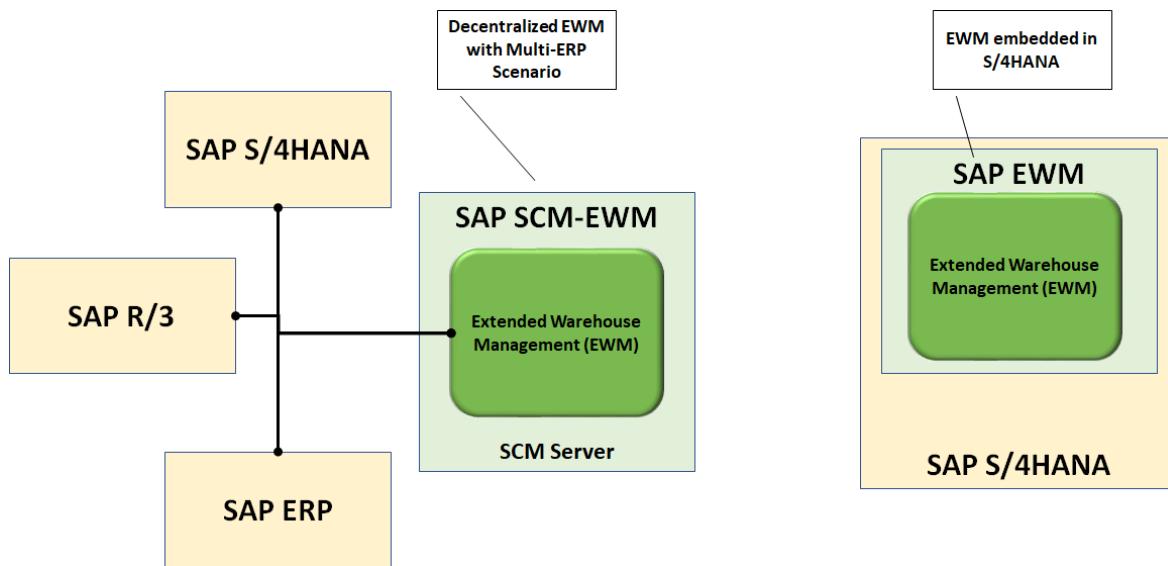


Figure 84: SAP EWM System Environment and Deployment Options

Both, Decentralized EWM and Embedded S/4HANA-EWM, are planned to share a common core of Warehouse Management functions, which will evolve over time with new functions in both EWM options. Thereby, both approaches are planned to cover the same business scenarios and processes with only minor exceptions. An example for these exceptions is that Embedded EWM will only be able to integrate with the local ERP client (the S/4HANA system it is

implemented on). This means that the EWM application within S/4HANA cannot integrate with multiple ERP systems except for some third-party LSP (Logistics Service Provider) scenarios.

Decentral EWM and Embedded SAP S/4HANA-EWM are planned to have different technical integration features with SAP ERP but identical integration with other SAP systems, for example, GTS, TM, etc.

3.2.2.2.1 SAP EWM embedded in SAP S/4HANA

From the perspective of an ERP system (such as SAP ERP), SAP EWM is always a decentralized WM solution, so that inbound and outbound deliveries are mandatory. Contrary, from the point of view of SAP S/4HANA, SAP EWM is integral part of the same system. However, inbound and outbound deliveries are still mandatory, but some intermediate documents are eliminated, which facilitates the integration of the two applications.

SAP EWM embedded in SAP S/4HANA is a new deployment option provided to SAP customers that provides a flexible solution to run all kinds of warehouses (small, midsize, and production warehouses) within a single SAP S/4HANA implementation. This approach considerably reduces integration and replication issues:

- Access to all material, product, and business partner master data within SAP S/4HANA without the need of replicating the data to a decentralized EWM system.
- Management of batch master data within SAP S/4HANA without the need of replicating the data to a decentralized EWM system.
- Direct reading of material values, purchase, process, and production order data without the need of replicating this data to a decentralized EWM system and storing them in an expected goods receipt (EGR) document.
- Skip warehouse request objects
 1. process only outbound delivery orders without using outbound-delivery requests
 2. process only inbound deliveries without having inbound-delivery notifications
 3. process only posting changes without using posting-change requests
- Maintain only one quality document instead of working with a quality inspection document and a QM inspection lot and eliminate the need to replicate accounting objects.

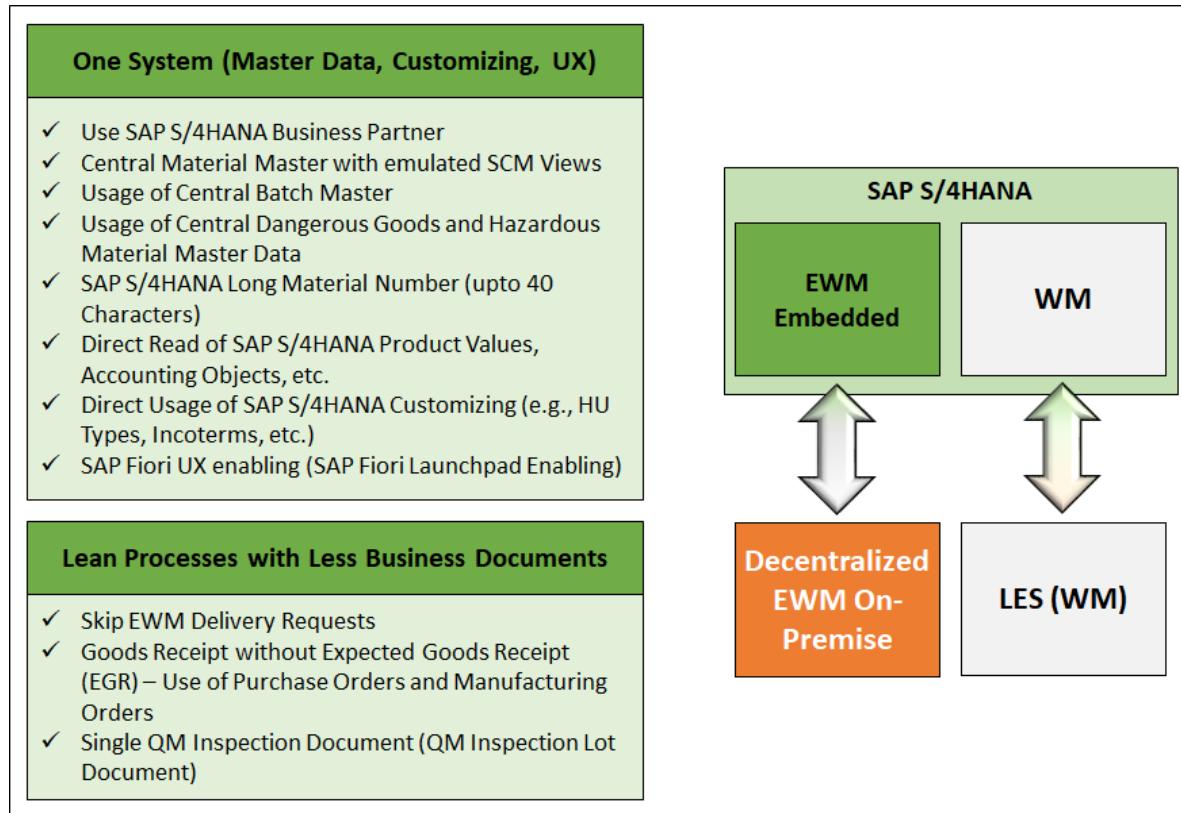


Figure 85: SAP EWM embedded in SAP S/4HANA (www.sap.com)

3.2.2.2.2 Decentralized EWM integrated with SAP S/4HANA

As mentioned afore, warehouse management systems with high throughput must provide quick response times, be available 24/7 and ensure low risk of downtimes. For this type of business-critical scenarios the warehouse management system is often installed on a different system than the ERP system to prevent any potential performance problems and ensure smooth operation for all the highly integrated logistics processes.

Deploying SAP EWM on the SAP Supply Chain Management (SCM) platform has the advantage of improved performance and flexibility and allows implementing EWM with modules, such as:

- Advanced Planning Optimization (APO)
- Service Parts Planning (SPP)
- Global Available-To-Promise (Global ATP)

In a decentralized environment, SAP EWM can be connected to all SAP systems starting from SAP R/3 release 4.6C and all subsequent system releases, which includes SAP R/3 Enterprise, SAP ERP ECC and SAP S/4HANA. However, depending on the ERP system release or any Enhancement Packages installed, certain functions or processes in SAP EWM might be unavailable. Details are described in the release notes, installation guides, and SAP notes.

The Decentral EWM approach (integrated to SAP S/4HANA) is planned as a long-term valid deployment option for EWM for the following reasons:

- Implementation of regional EWM systems
- Risk mitigation
- Specific planned down-times independently from the operative ERP system

- Possibility of scale-out for large distribution centers
- Connecting multiple ERP systems
- Different release cycles for EWM and S/4HANA
- Proximity to warehouse (MFS – Material Flow System).

3.2.2.2.3 Integration with SAP S/4HANA and Data Transfer

When SAP EWM is implemented as a decentralized solution, master and transactional data must be synchronous between SAP EWM and SAP S/4HANA, at all times:

- **Master Data:** The SAP EWM master data (material master, location, and business partner) from the SAP S/4HANA system is replicated using the already known APO Core Interface (CIF).
- **Transaction Data:** Documents (such as inbound and outbound deliveries) from SAP EWM is exchanged between the SAP S/4HANA system and SAP EWM using a Business Application Programming Interface (BAPI) interface.

When SAP EWM is implemented as part of SAP S/4HANA in an integrated environment, the master data replication via CIF is no longer required as both systems can directly access the master data of each application.

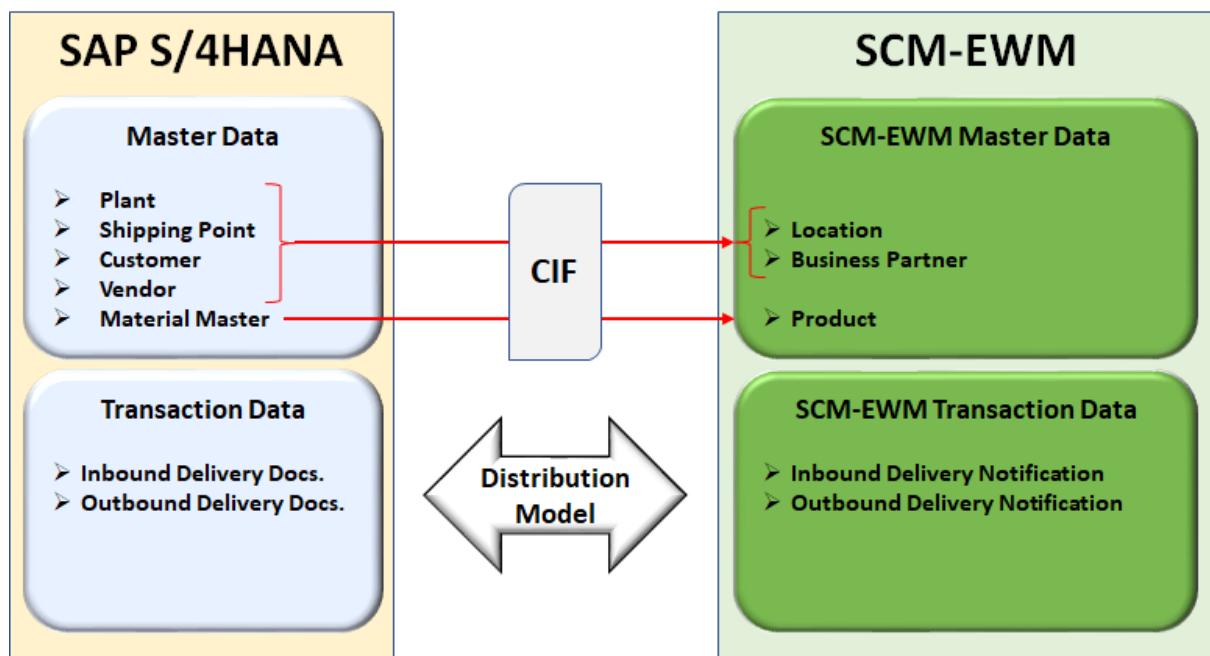


Figure 86: Data Transfer: Decentralized EWM and SAP S/4HANA (SAP Online Library)

As explained before when introducing the Decentralized WM approach, a Decentralized EWM is also logically or physically separated from the SAP S/4HANA system, which means the following for the collaboration between the two systems:

- The regular logistical business processes, such as sales order management or creation of purchases orders, and the corresponding deliveries are performed in S/4HANA.
- Warehouse-specific processes, such as goods receipt, storage, goods issue, and monitoring warehouse activities are performed by the decentralized EWM.

The communication between EWM and S/4HANA (regardless of the approach) is – as with the decentralized WM – essential and achieved in the following ways:

- Inbound and outbound deliveries for incoming and outgoing goods are created in the SAP S/4HANA system, and then replicated via corresponding BAPIs to the decentralized EWM system.
If EWM is integrated into S/4HANA, no replication is required. The corresponding documents are created directly in EWM.
- Once a goods movement is finalized or “posted” in the Decentralized EWM, it is replicated back via BAPIs to the SAP S/4HANA system and updates the status of the involved process documents (e.g., sales order status).
If EWM is integrated into S/4HANA, again, no replication is required. The documents in SAP S/4HANA Material Management are posted automatically in parallel.

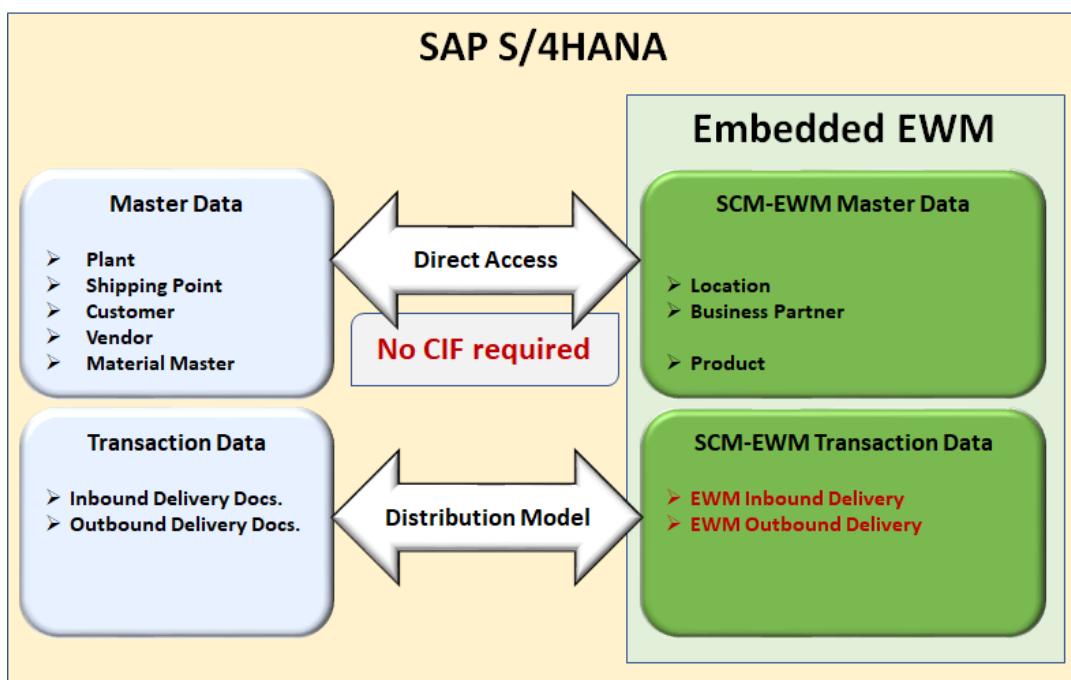


Figure 87: Data Transfer: SAP EWM embedded in SAP S/4HANA (SAP Online Library)

3.2.3 Organizational Units of Warehouse Management

If any Warehouse Management solution (Lean-WM, WM, EWM) is used in an SAP environment, additional organizational units are required in the ERP system (R/3, ERP, S/4HANA) and the EWM system. When EWM is connected to (integrated with or embedded in) an ERP system, there are organizational units, which must be available in both systems (ERP and EWM).

3.2.3.1 Organizational Units for Warehouse Management

Inventory Management takes place in the ERP system. Thereby, material stocks are stored in a plant at the level of storage locations. You already know these two organizational units from previous teaching units.

Plant

A plant depicts a location where goods are produced (manufacturing plant), stored and shipped (distribution center), or where services are provided. In Financial Management, a plant is uniquely assigned to a company code.

Storage Location

A plant can have one or multiple storage locations which are used to keep the stock from the point of view of Inventory Management (MM-IM). For using Inventory Management in S/4HANA, at least one storage location must be defined within a plant.

You define multiple storage locations in a plant to be able to:

- Differentiate between the various stocks of material in a plant
- Differentiate between the physical storage characteristics
- Classify the quantities of material in a plant to indicate their use (e.g., available for sale) or their logical location (e.g., at a third-party logistics provider)

For instance, one could define two different storage locations in a plant for the following use cases:

- RD00 (Received on Dock): This storage location is used to track stock that is in the process of putaway. These material quantities are not yet physically available.
- AS00 (Available for Sale): After the product is stored in its destination storage bin, a transfer posting changes the stock storage location from RD00 to storage location AS00. The material quantities are now available for sale (e.g. goods issue posting).

Warehouse Number

The warehouse number is the highest organizational level in the Warehouse Management application (WM in SAP ERP or S/4HANA). You use the warehouse number to define a complete physical warehouse. A single warehouse number can manage several individual warehouse buildings that, together, form a complete warehouse complex. Usually, a warehouse number depicts a physical building or distribution center.

Even though, EWM has nothing to do with the classic SAP Warehouse Management application, both applications use a “warehouse number” to represent the physical warehouse where materials are stored and managed. Accordingly, you must create a warehouse number in the customizing of the ERP system, which is then activated as **EWM warehouse number**. In the ERP system, the warehouse number has a three-character field, which is translated into a four-character field in EWM.

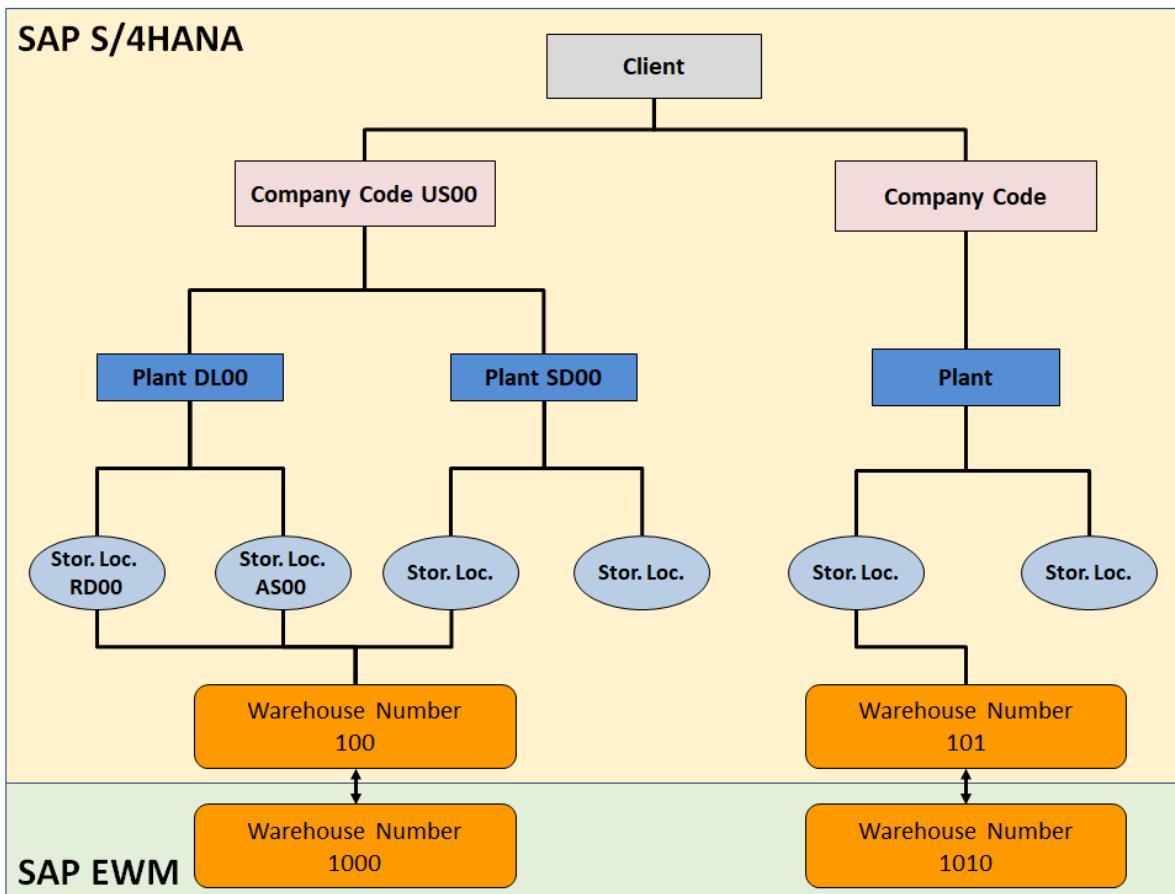


Figure 88: Organizational Units for Warehouse Management

Assignment of Warehouse Number

Warehouse Management is activated in the ERP system, by assigning a **plant-storage-location-combination** to the respective **warehouse number**. This constitutes the link between *Warehouse Management* and *Inventory Management* and allows for using *warehouse management functions* in the ERP environment. You do not necessarily need to assign all storage locations that have been created with inventory management in a plant to one warehouse number.

You can assign several plant-storage-location-combinations to one warehouse number. However, the same plant-storage-location-combination cannot be assigned to different warehouse numbers.

3.2.3.2 Structure of a Warehouse Number in SAP EWM

Each warehouse number has a substructure which maps the detailed spatial relationship in the warehouse complex. When using classic WM in SAP ERP (within the LE application), you create a sub-structure for the warehouse number in the ERP system. When using EWM, the structure is created in the EWM application.

The warehouse structure in Warehouse Management is hierarchical. You can define an entire physical warehouse complex, in WM, by using a single warehouse number. Each of the warehouse facilities or areas that make up the warehouse complex can be defined as a type of storage area on the basis of its spatial, technical, and organizational characteristics.

Storage Type

These storage areas depict the different forms where products are physically stored within the warehouse number and are referred to as **Storage Types**.

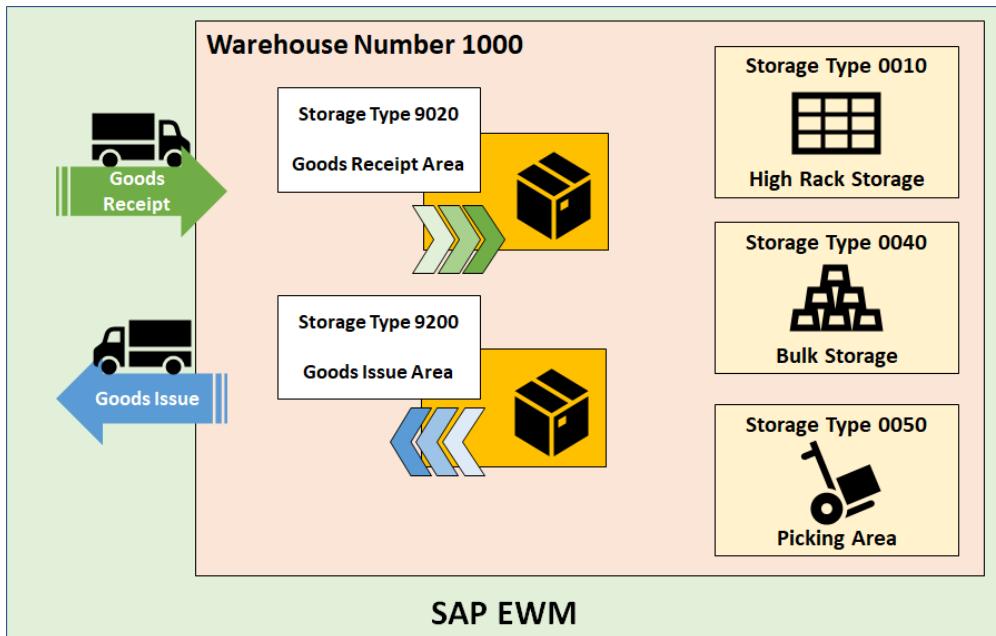


Figure 89: Storage Types in Warehouse Management (SAP Online Library)

Examples for Storage Types include:

- Different types of racks
- Bulk storage
- Open storage
- Picking area
- Goods receipt area
- Goods issue area

Storage Types group together **Storage Bins** with similar features

Storage Section

Storage sections are used to further subdivide a Storage Type according to organizational or logical characteristics. Storage sections can also group together **Storage Bins** with similar features. The criteria for grouping bins can be defined on a user-individual basis, for example, heavy parts, bulky materials, fast-moving items, slow-moving items. Example for use of storage types:

- Fast-moving materials, that is, material frequently sold, are supposed to be placed in storage space that is accessible easily. For instance, you place those materials at the entrance of the storage or on the low bins.
- Perishable goods must be kept refrigerated.
- For each material type or requirement, you can define special storage sections. The following figure displays storage sections with bins:

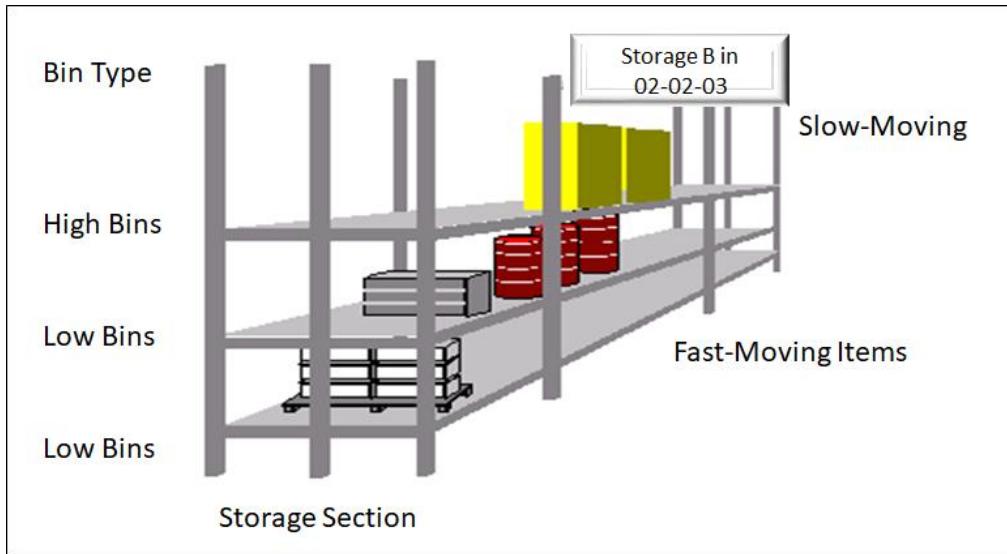


Figure 90: Storage Sections and Bins in Warehouse Management (SAP Online Library)

Storage Bin

Storage Bins are master data and represent the lowest level of organizational structure in the warehouse number. Storage Bins are assigned to a Storage Type and a Storage Section (if the Storage Type is further subdivided). Storage Bins depict the physical location where the goods are stored in the warehouse and provide the exact coordinates for that location within the warehouse number.

Activity Area

Independently of the Storage Type to which a Storage Bin belongs, they are logically grouped in so-called **Activity Areas**. Activity Areas are defined for each activity:

- Picking
- Putaway
- Physical Inventory

When warehouse orders are created Activity Areas are used to define sorting of Storage Bins. According to the activity, the same storage bin can be assigned to multiple activity areas.

Quant

For material stocks that are kept in a Storage Bin, the quantity of the stock in that Storage Bin is represented as a **Quant**. A quant is the content of a Storage Bin and is used for Inventory Management of a material in a Storage Bin.

The following figure illustrates the structural elements of a warehouse number.

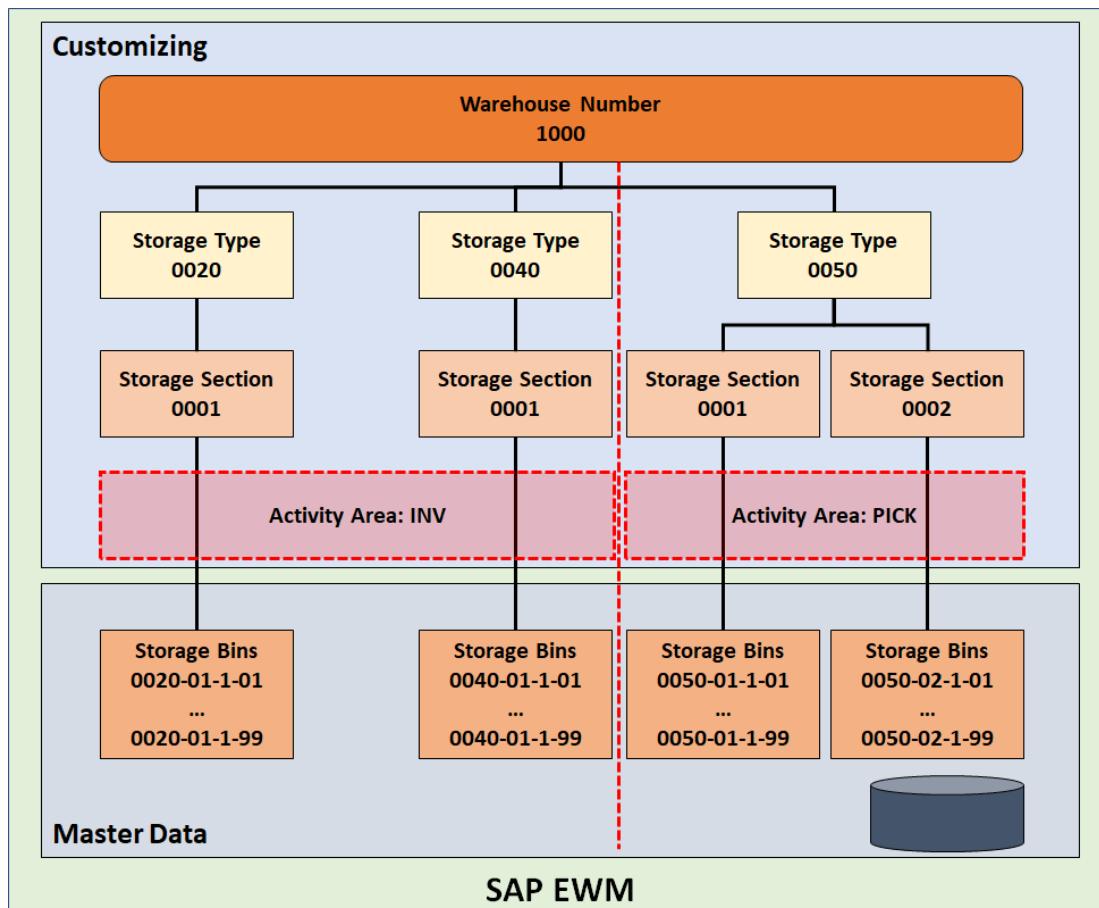


Figure 91: Structure of a Warehouse Number

3.2.4 Business Processes in Extended Warehouse Management

The purpose of SAP EWM is to implement a system for managing complex supply chain networks. It should be deployed for warehouses or distribution centers with:

- High throughput of many different materials that have differences in their characteristics, such as size, weight, serial number, country of origin, batch, valuation
- Complex cross-docking and order-fulfillment requirements
- Detailed packaging and shipping logistics requirements

There are several business processes in SAP S/4HANA that might trigger activities in EWM, of which many are directly or indirectly related to the sales process. Examples are:

- Marketing activities in a CRM system could generate leads and opportunities which result in the creation of a sales order, which is then transferred to S/4HANA for further processing. There are scenarios, where some functions of SAP EWM require specific sales orders that have been created in SAP CRM. For instance, if billing is accomplished in SAP CRM, a CRM sales order type is used. CRM billing creates the invoice after goods issue. However, if you require the invoice printout (e.g., for international transportation) before the end of the loading and transportation process, you can create the current invoice before goods issue posting by sending an invoice request from EWM to CRM billing.
- The sales and distribution business process is integrated with other SAP applications such as Production (MRP, Manufacturing), Material Management (Purchasing),

Financial Accounting and Controlling. For instance, production might require the transport of raw materials to the production facility or inbound processing from purchase orders might require receipt and putaway of purchased materials into the warehouse.

- The outbound delivery business process of warehouse management not only deals with order deliveries for customers but could also deal with stock transport orders. In that process, one plant in the company requests material from another plant within the same corporate enterprise. This leads to a long-distance physical stock transfer controlled by warehouse management.

The following figure illustrates central business processes supported by SAP EWM for the main areas of inbound and outbound processing as well as warehouse-intern processes of storage and inventory management. In addition, auxiliary functions and technologies that serve as enablers and cross-application functionalities are displayed at the bottom of the figure.

In the following chapters we will discuss some of these business processes and technologies.

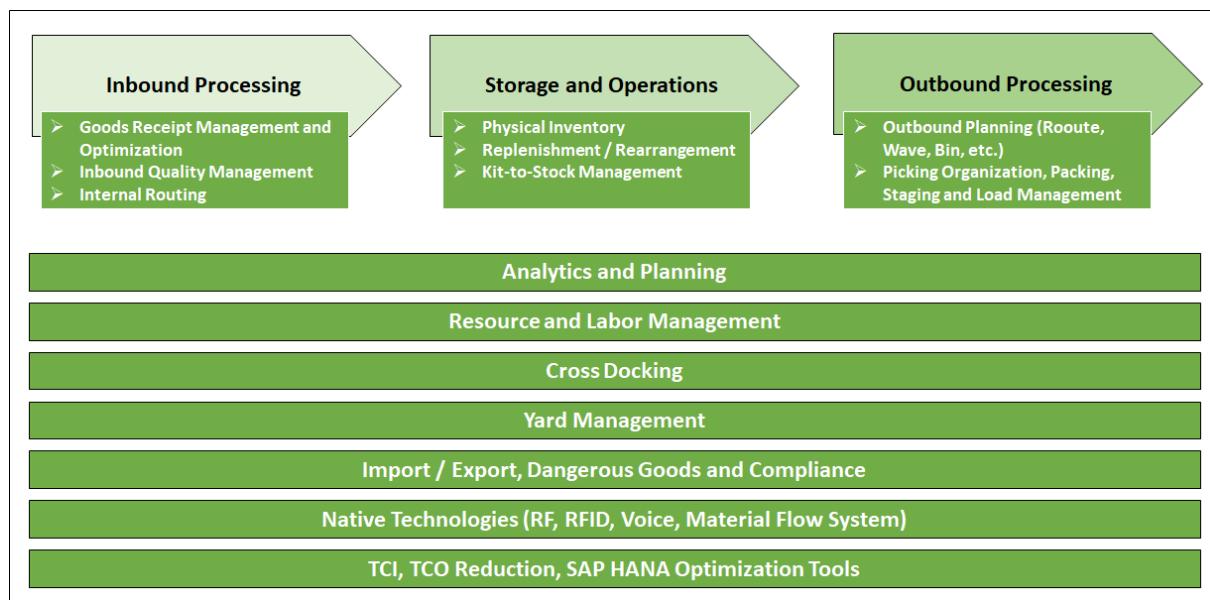


Figure 92: Business Processes in Extended Warehouse Management

3.2.4.1 Outbound Process in SAP EWM

You already know the standard outbound delivery process of SAP S/4HANA. The following figure shows the outbound process flow, the involved documents in and the relationships of the outbound delivery documents, when SAP EWM is involved.

The outbound delivery process with SAP S/4HANA in collaboration with EWM involves the following documents:

- Sales Order in S/4HANA
- Outbound Delivery in S/4HANA
- Outbound Delivery Order in EWM
- EWM Outbound Delivery in EWM
- Goods Issue in EWM

Sales Order and Outbound Delivery Documents in S/4HANA

In the standard sales process, a customer orders a product. In the SAP system landscape, the process is mapped using different documents that map individual steps (business transactions) in the process and control the activities in each step. The status of each document shows the stage in the sales process that a sales order has reached. If necessary, these documents are sent to the assigned systems:

1. The sales division creates a sales order in SAP CRM or SAP S/4HANA.
2. Once, the material is ready for delivery, an outbound delivery is created.
3. If that outbound delivery is relevant for picking (in an SAP EWM managed warehouse), it is forwarded to SAP EWM.
4. After SAP EWM took care of picking and shipping in the warehouse, the goods are shipped to the ship-to party and the goods issue is posted in SAP S/4HANA. This results in the creation of a material document and an accounting document in S/4HANA.
5. A billing document is created and sent to the bill-to-party.
6. The payer pays the amount specified on the billing document.

Outbound Delivery Order

In a scenario which involves picking of the materials in EWM for the delivery, the outbound delivery is transferred to EWM and created there as **Outbound Delivery Order**. This document is the *warehouse request document* for the goods issue processes and is the basis for all further documents and processes within a delivery (e.g. the picking process, create warehouse tasks and post the goods movements). It contains the data required for triggering and monitoring the complete outbound delivery process in EWM, which starts with the initial planning activities for the outbound delivery and continues until the goods have been loaded and sent. The outbound delivery order defines the work list for SAP EWM and is used to

- Preview the planning of pending warehouse activities.
- Execute the actions required to create a delivery.
- It is also possible to perform the following actions:
 1. Determine the source storage bin, the staging area, the door assignment, and the route.
 2. Add a packing item.

If the outbound delivery order is created and saved, the following steps are executed:

- Mapping delivery data from SAP S/4HANA onto the SAP EWM delivery data.
- Enriching data using data from SAP EWM customizing.
- Performing wave assignment if configured in customizing.
- Determining the Warehouse Process Type, which controls warehouse task processing in SAP EWM.
- Performing automatic packing (creation of Handling Units) according to a packaging specification.
- Sending current data to SAP BW when a delivery item has been completed in SAP EWM (depending on customizing). This only happens if the update of delivery items into BW has been activated.

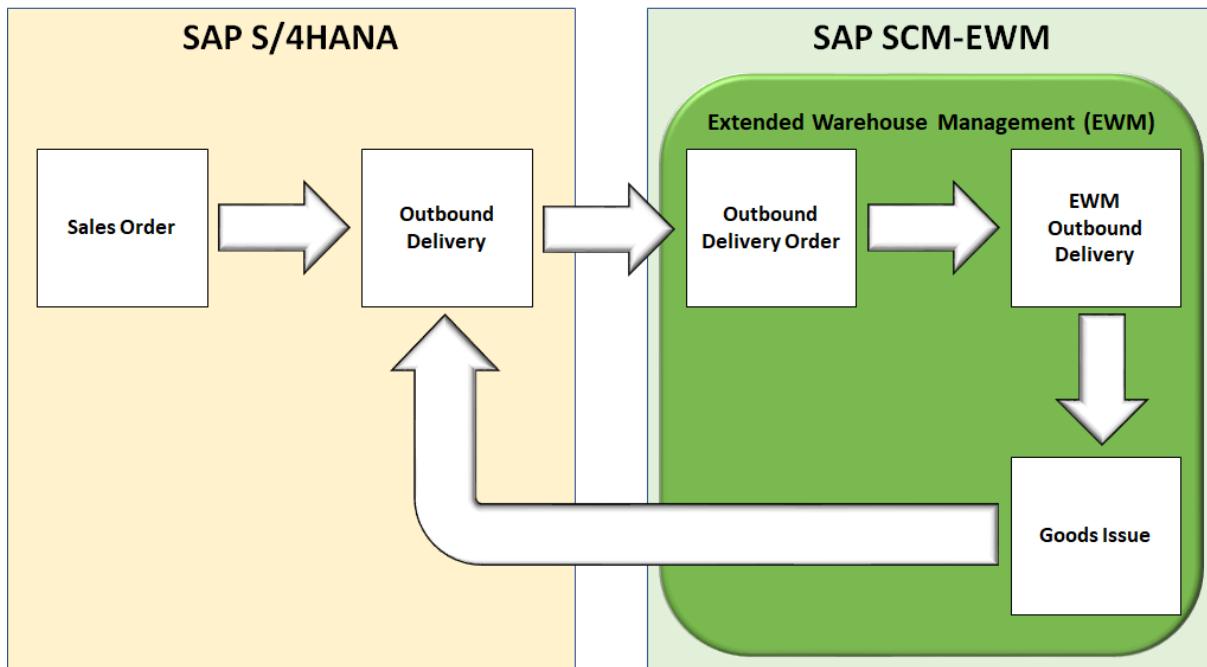


Figure 93: Outbound Process in SAP EWM (SAP Online Library)

EWM Outbound Delivery and Goods Issue

The SAP EWM outbound delivery document groups all materials to be delivered together to a single goods recipient. After all materials have been picked and ready at the goods issue zone, the goods issue can be posted. Alternatively, a goods issue can be triggered by processing a transportation unit or a vehicle.

For the goods issue, another SAP EWM document is created: the **EWM Outbound Delivery**.

- The SAP EWM Outbound Delivery sends information about the **goods issue posting** back to SAP S/4HANA, which leads to the creation of the inventory management document (material document) and the financial documents, such as accounting document, and depending on the scenario, other financial documents (e.g., controlling document).
- In case that it is not possible to deliver the complete quantity specified on the outbound delivery order, for instance, due to low stock levels, a **partial delivery** could be initiated. In the case where a partial delivery is necessary, a **delivery split** is used.

3.2.4.2 Transfer Posting or Physical Stock Transfer

In teaching unit 1 (Purchase-to-Pay business process) we already have introduced the concept of goods movements. There are four general types of goods movements in the SAP system: goods receipts, goods issues, stock transfers, and transfer postings.

The latter two are relevant when moving materials within a company even though a physical movement of the material is not always the case. The main difference between stock transfers and transfer postings is that **transfer postings** does not necessarily have (but can) involve a physical goods movement. They are used to change the stock type, batch number, or material number of a material. A **stock transfer**, however, is always connected with a physical goods movement. In the following we will introduce stock transfers and transfer postings

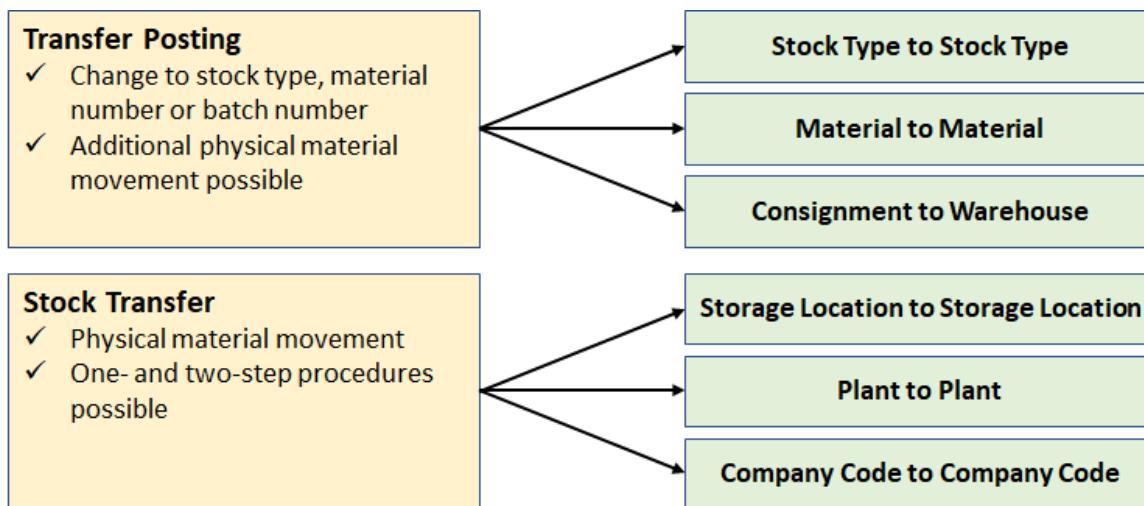


Figure 94: Transfer Posting or Physical Stock Transfer (SAP Online Library)

3.2.4.2.1 Transfer Postings

As mentioned afore, a transfer posting is used to change the stock type, batch number or material number of a material. A transfer posting does not need to involve a physical movement of the material. However, an additional physical material movement along with the transfer posting is possible. Examples of transfer postings in the SAP system are:

- Stock-to-stock (e.g., transfer from quality inspection stock to unrestricted-use stock)
- Material-to-material (e.g., change of material ID)
- Consignment-to-warehouse (e.g., post consignment material to the quality inspection stock)

Transfer Posting Stock-to-Stock

There are three major types of stocks in Inventory Management, which you already know. Each of these stock types indicates whether and how the material concerned can currently be used:

- Unrestricted-use stock
- Quality inspection stock
- Blocked stock

At the time of goods receipt, you decide the type of stock to which a given quantity is to be posted. The stock type is relevant for the determination of available stock in Materials Planning (MRP) and for the withdrawal of materials in Inventory Management. You can post withdrawals for consumption from unrestricted-use stock only.

If the utilization of a material changes, you might need to carry out *transfer postings between the various stock types*. An example of a transfer posting is the release of a given quantity from stock in quality inspection. This means that the quantity is transferred from stock in quality inspection to unrestricted-use stock. The movement type controls between which stock types a transfer posting occurs.

The following figure illustrates the movement types used for transfer postings between the three major stock types. A *physical stock transfer* posting between two storage locations can also be linked with a *stock-to-stock transfer posting*.

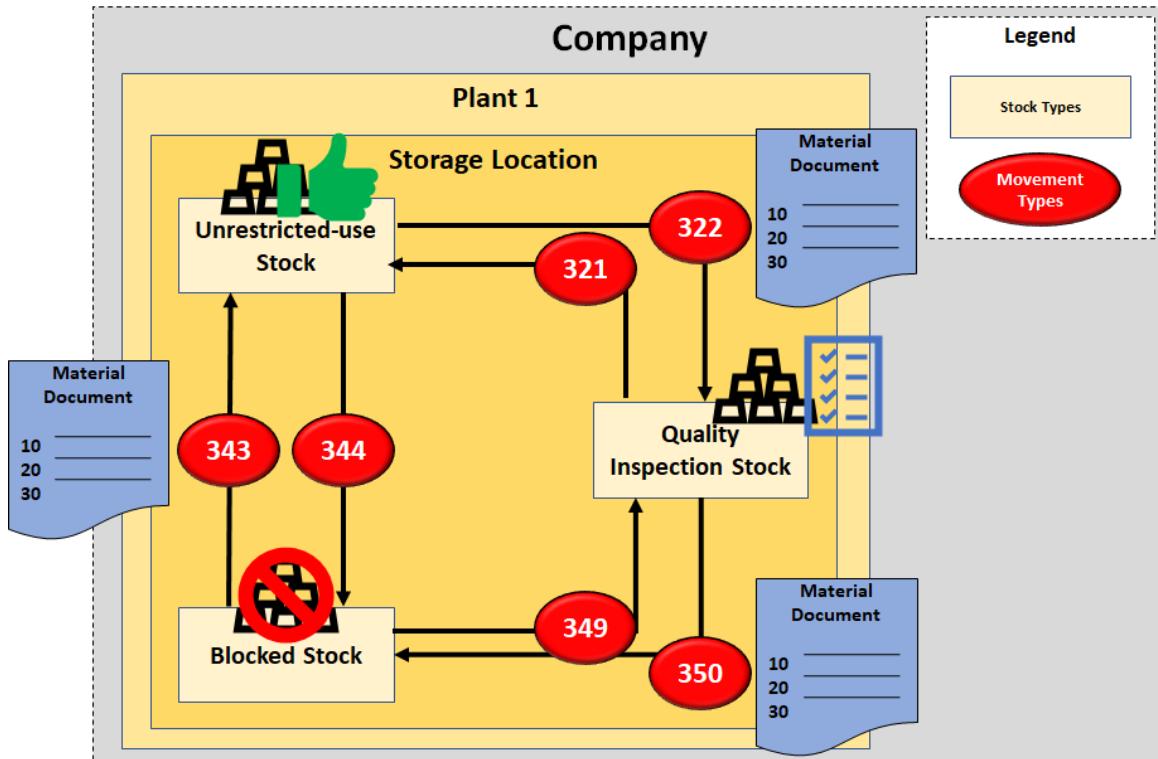


Figure 95: Stock-to-Stock Transfer Postings and Movement Types

Just like with any goods movements, the system creates a material document during transfer postings to document the transaction in the system. However, stock-to-stock transfer postings are not relevant for valuation and, thus, no accounting document is created.

3.2.4.2.2 Stock Transfers

Depending on the organization of the company (e.g., decentralized storage) and its sales policy, internal stock transfers might be necessary. Thereby, materials are physically moved from one storage location to another.

Organizational Levels for Stock Transfers

Stock transfers can occur at three different levels:

- Stock transfer from **company code to company code**: A Stock transfer from company code to company code corresponds to a stock transfer from plant to plant, with both plants belonging to different company codes.
- Stock transfer from **plant to plant**:
 - o A stock transfer from plant to plant not only leads to a change in stock quantity in both plants; if both plants are assigned to different valuation areas, an accounting document is also created.
 - o This type of stock transfer can only be carried out from unrestricted-use stock of the issuing plant to unrestricted-use stock of the receiving plant.
 - o Stock transfers from plant to plant are relevant for material planning, since material planning operates at plant level.
- Stock transfer from **storage location to storage location** (within the plant):

- A stock transfer from storage location to storage location in the same plant simply causes an update of the stock quantities in both storage locations. The stock value remains unchanged, and the event is not relevant for accounting.
- Stock transfer from storage location to storage location using the one step procedure can involve all stock types.

One-step and Two-step Procedures for Stock Transfers

Stock transfers **always** contain 2 movements: a *goods issue* from the issuing point and a *goods receipt* at the receiving point

There are three different procedures for carrying out a stock transfer:

- Stock transfer via stock transfer posting using the one-step procedure
- Stock transfer via stock transfer posting using the two-step procedure
- Stock transfer using a stock transport order (with or without delivery)

Characteristics of **one-step procedure**: only one single transaction is executed

Characteristics of the **two-step procedure**:

- Better monitoring of stocks that are in the process of transferring from one place to another. That is, when you have posted the goods issue from the issuing point, the stock is regarded as **in transfer** at the receiving point and is treated as such in the system. You can then display this status and know exactly where the stock currently is.
- For stock transfer in two separate steps valuation always takes place at the first step.
- Two-step procedure is also used if a user has authorizations only for their own plant.

Material and Accounting Documents for Stock Transfers

As mentioned before, stock transfers are relevant for Inventory Management (material document) and in some cases for Financial Accounting (accounting document). The following figure shows the individual scenarios for the one- and two-step procedures for stock transfers.

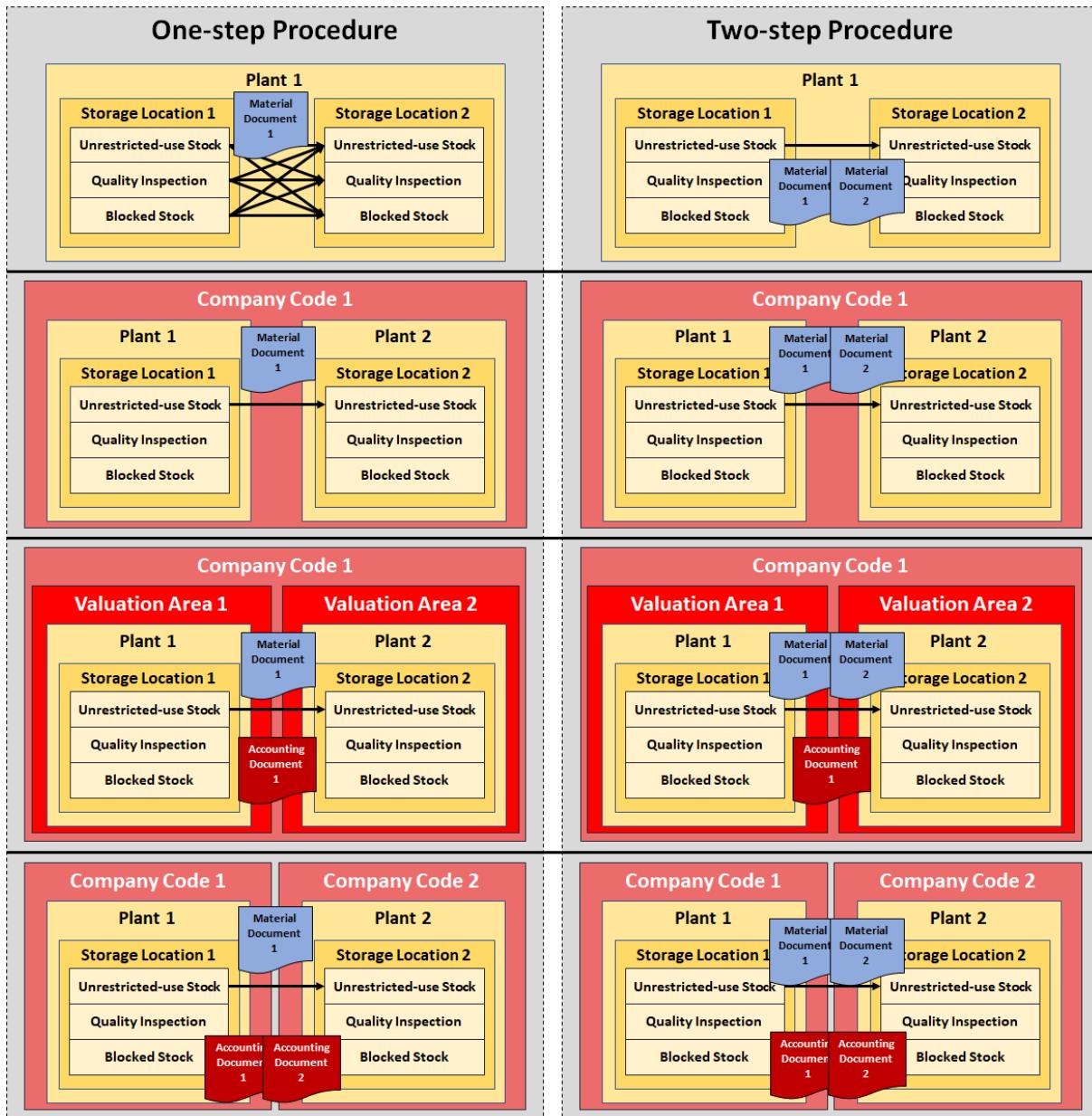


Figure 96: One-Step vs. Two-Step Procedure



ELUCIDATION

Elucidation: The following shows a matrix of outcomes of stock transfers for the one- and two-step procedures. The differences are highlighted in red, important issues are highlighted bold and underlined.

	One-step Procedure	Two-step Procedure
storage-location-to-storage-location	<u>One</u> Material document with <u>two</u> items	<u>Two</u> Material documents <ul style="list-style-type: none"> • goods issue <u>two</u> items • goods receipt <u>one</u> items
	<u>No</u> Accounting document (same plant = same valuation area) Only exception from this rule: split valuation	<u>No</u> Accounting document (same plant = same valuation area) Only exception from this rule: split valuation
	Possible for <u>all</u> stock types	Goods movement only from Unrestricted-use (Sender) to Unrestricted use (Receiver)

		Goods are posted in stock-in-transfer before goods receipt posting
plant-to-plant plants belong to same company code and have same valuation area	<p><u>One</u> Material document with <u>two</u> items</p> <p><u>No</u> Accounting document (plants have same valuation area) Only exception from this rule: split valuation</p> <p>Goods movement only from Unrestricted-use (Sender) to Unrestricted use (Receiver)</p>	<p>Two Material documents</p> <ul style="list-style-type: none"> • goods issue <u>two</u> items • goods receipt <u>one</u> items <p>No Accounting document (plants have same valuation area) Only exception from this rule: split valuation</p> <p>Goods movement only from Unrestricted-use (Sender) to Unrestricted use (Receiver)</p> <p>Goods are posted in stock-in-transfer before goods receipt posting</p>
plant-to-plant plants belong to same company code but have different valuation area	<p><u>One</u> Material document with <u>two</u> items</p> <p><u>One</u> Accounting document (different valuation areas)</p> <p>Goods movement only from Unrestricted-use (Sender) to Unrestricted use (Receiver)</p>	<p>Two Material documents</p> <ul style="list-style-type: none"> • goods issue <u>two</u> items • goods receipt <u>one</u> items <p>One Accounting document (different valuation areas)</p> <p>Goods movement only from Unrestricted-use (Sender) to Unrestricted use (Receiver)</p> <p>Goods are posted in stock-in-transfer before goods receipt posting</p>
	<p>Valuation price of the issuing plant Offset to clearing account of company code</p>	<p>Valuation price of the issuing plant Offset to clearing account of company code</p>
company-code-to-company-code plants belong to different company code and thus have different valuation areas	<p><u>One</u> Material document with <u>two</u> items</p> <p><u>Two</u> Accounting documents (one per company code)</p> <p>Goods movement only from Unrestricted-use (Sender) to Unrestricted use (Receiver)</p>	<p>Two Material documents with two items</p> <ul style="list-style-type: none"> • goods issue <u>two</u> items • goods receipt <u>one</u> items <p>Two Accounting documents (one per company code)</p> <p>Goods movement only from Unrestricted-use (Sender) to Unrestricted use (Receiver)</p> <p>Goods are posted in stock-in-transfer before goods receipt posting</p>
	<p>Valuation price of the issuing plant Offset to clearing account of company code</p>	<p>Valuation price of the issuing plant Offset to clearing account of company code</p>

Stock Transport Order

The third procedure for transferring materials via stock transfers from one plant to another is to create a so-called **Stock Transport Order**. Basically, a stock transport order is a **purchase order** where the “vendor” is the delivering plant and the receiver is the receiving plant (storage location). Consequently, with stock transport orders **pricing conditions** can be utilized in the same way they are used in regular purchase order. Stock transport orders can be used in Materials Management (MM) when receiving materials as well as in Sales and Distribution (SD) when distributing materials. In SAP MM stock transport orders create a **stock requirements list** entry in the delivering plant. This allows material and production planning to account for material departures when creating the demand program. In SAP SD delivery and billing documents can be created as subsequent documents to a stock transport order.

Stock transfers with stock transport orders can be posted using the one-step or the two-step procedure. With the two-step procedure, the following process is accomplished:

1. A goods issue from the first plant (supplying sending plant) is posted.

2. This transfers the material into the in-transit stock type of the second plant.

3. A goods receipt to the second plant (receiving/requesting plant) is posted

4. This transfers the material into the receiving stock type of the second plant.

If the second plant is controlled by a warehouse number in terms of warehouse management processes, further detailed transport processing and monitoring is possible (e.g. creation of a transport requirement).

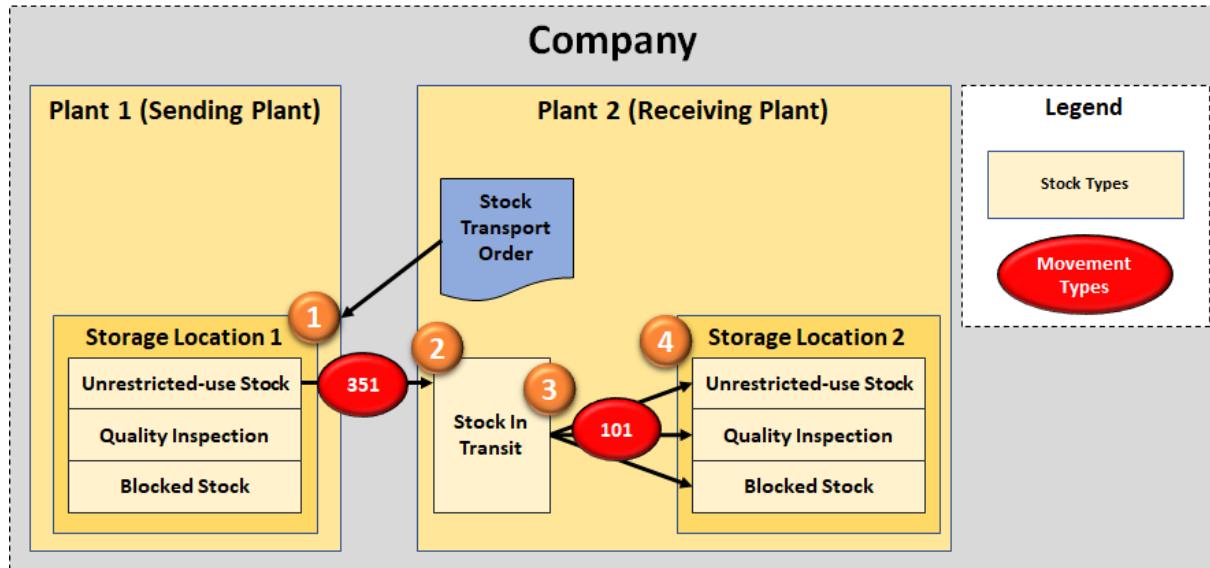


Figure 97: Stock Transport Order

Performing a stock transfer by using a stock transport order has the following advantages over stock transfer postings without using a stock transport order:

- Integration with MRP application allows to convert purchase requisitions into Stock Transport Orders
- You can initiate goods receipt at the receiving plant. Thus, goods issue posting in the issuing plant is created subsequently.
- You can post delivery costs and the carrier/forwarder in a Stock Transport Order
- Goods receipt can be posted directly to consumption (process that needs the material, e.g., production).
- When posting a goods receipt into the warehouse, you can also transfer the material into quality-inspection or to blocked stock in addition to unrestricted-use stock.
- The entire process of goods issue and goods receipt can be monitored by using the purchase order history.

3.3 Theory: Transportation Management



THEORY

Supply Chain for Transportation Management (SAP TM) is the SAP S/4HANA application that provides all functionalities to manage physical transportation of goods from one location to another. For instance, TM is used to perform the following activities:

- Create transportation requirements from ERP documents (sales orders, purchase orders)
- Plan the transportation and select carriers
- Tender transportation services
- Dispatch and monitor the transportation
- Calculate the transportation charges for the ordering party as well as the supplier side
- Consider foreign trade and dangerous goods regulations

In this chapter, we will briefly discuss the SAP TM application and the Basic Shipping Process.

3.3.1 Process View and Technical Components

In SAP ERP, the Basic Shipment Process was covered by the LE-TRA (Logistics Execution Transport) application. This application and the Basic Shipment Process are still available in SAP S/4HANA.

However, SAP S/4HANA Supply Chain for Transportation Management (SAP TM) will completely replace the classical LE-TRA functionality in SAP S/4HANA by the year 2025. The following figure illustrates SAP's roadmap for this application

- **SAP S/4HANA 1610:** Until SAP S/4HANA 1610 (including the SAP ERP), the LE-TRA application was the only option for companies that needed to implement transportation processes. LE-TRA is in the so-called compatibility scope. This means that it is not part of the digital core and that usage will no longer be possible after the year 2025.
- **SAP S/4HANA 1709:** As of SAP S/4HANA 1709, SAP TM is embedded in SAP S/4HANA and can be used to cover Basic Shipping processes instead of LE-TRA. Since LE-TRA also covers the Basic Shipping process and is also included in the standard license of SAP S/4HANA – customers can choose to use either LE-TRA or SAP TM or even both applications. However, a restriction is that LE-TRA and SAP TM cannot exchange data in SAP S/4HANA.

Both applications will be available side-by-side and can be used until 2025. The Basic Shipping process is part of the standard SAP S/4HANA license. If customers want to use full capabilities of SAP TM, they have to purchase an additional full TM license.

- **As of 2025:** As of 2025, LE-TRA will not be available anymore and SAP TM will be the only supported application for any transportation process. The Basic Shipping process (of SAP TM) will still be covered by the standard SAP S/4HANA license.

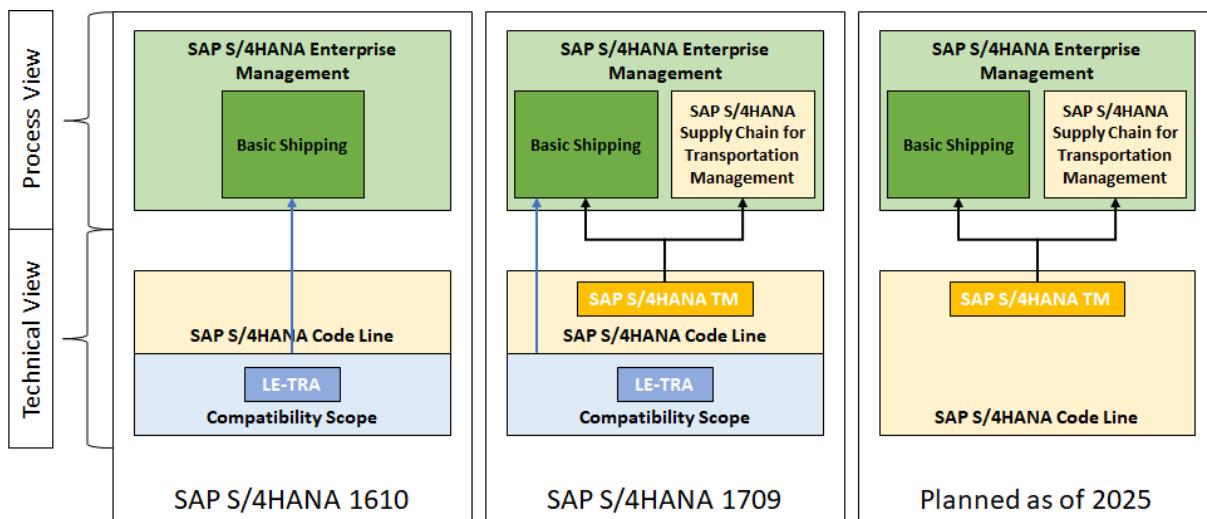


Figure 98: Process View and Technical Components (Rovang 2018)

3.3.2 Basic Shipping Process in SAP TM

The standard SAP S/4HANA license already covers the **basic shipping process**, which is part of the classic LE-TRA application as well as the TM application. It provides the following functionalities:

- Main parts of the transportation network (e.g. zones, lanes)
- Inbound and Outbound Shipment Management (Delivery Note-based)
- Basic Transportation Planning (Delivery Note Selection)
- Manual carrier selection and manual tendering
- Transportation execution (without Event Management)
- Output Management
- Basic charge calculation and freight settlement
- Analytics in BW

If customers want to use the full scope of SAP S/4HANA Supply Chain for Transportation Management a separate license for SAP TM must be acquired. The full scope of functionalities comprises:

- Harmonized Master Data and Customizing
- Combined Inbound / Stock Transfer / Outbound Transportation Process for Shippers
- Transportation Cockpit
- Order and Delivery-Based Planning Process
- Vehicle Scheduling and Routing Optimization
- Automated Carrier Selection
- Driver Management
- Load Consolidation
- Package Building
- Load Planning / Load Optimization
- Incorporated Tendering Management
- Event Management (use for Transportation Events)
- Carrier / Service Billing
- Embedded Core Data Service based Analytics

The Basic Shipping Process is illustrated in the following figure and consists of the following components:



Figure 99: Transportation Process in SAP TM (Rovang 2018)

1. **Order Management:** This process step deals with the creation of a transportation requirement. Examples for transportation requirements – that is documents that constitute a requirement for a good to be transported – are sales orders, purchase orders, deliveries, etc.
2. **Transportation Planning:** In this step, the afore created transportation requirements are planned in SAP TM, which provides manual planning functions, optimizer planning, and semi-automated processes (transportation proposal creation) for this purpose. SAP TM supports different aspects of planning, such as
 - means-of-transport selection (e.g. rail vs. road)
 - carrier selection based on real carrier rates
 - load optimization (3D-planning of container/truck utilization)
3. **Transportation Execution:** After the planning process is accomplished, SAP TM can be also used to support the execution of transports. Transport Execution includes:
 - delivery creation
 - document creation (print or electronic, like waybills)
 - event management integration (track and trace)
 - warehouse integration (EWM integration)
4. **Freight Costing and Settlement:** If a company does not operate an own fleet of transportation vehicles, it must ensure that the external carriers are paid for the services. With SAP TM you can maintain freight agreements, calculation sheets, and rate tables to accurately define real carrier costs. The results are used for charge calculation (already in the planning phase, carrier selection), but also for settlement processes after the transport has been executed.
5. **Analytics and Reporting:** Finally, embedded analytics and reporting functionalities of SAP TM can be used to monitor and analyze the transportation process.

3.3.2.1 Order Management

Accurately receiving and efficiently processing orders are crucial capabilities in the logistics business. Therefore, SAP TM provides the following order management features:

- Holistic integration and management of all transportation demand with
 - o Lead-to-Cash processes
 - o procure-to-pay processes,
 - o business-rule-based change management in real time,
to help ensure a closed-loop communication cycle
- Customer delivery commitments are enabled using synchronized sales order scheduling.
- Integration with order and delivery data, including full order access and visibility into the status of each order (document flow).

Currently (release 1709) SAP TM supports the following transportation requirements:

- Sales orders
 - Purchase orders
 - Stock transport orders
 - Returns
 - Scheduling agreements
 - Inbound / Outbound deliveries

SAP Transportation Management provides all functionalities to optimize transportation plans down to the level of individual shipments and containers and helps improving resource utilization and reducing transportation costs. It allows consolidating domestic or international shipments, as well as shipments that use single or multimodal transportation. The application can help companies to achieve the right level of centralized or decentralized planning and allows them to identify synergies and meet their delivery goals.

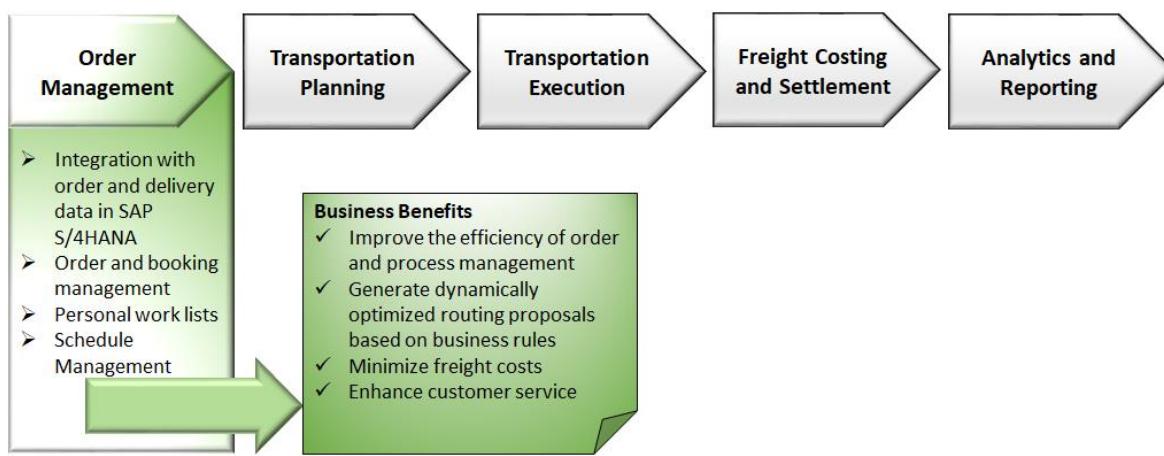


Figure 100: Order Management (Rovang 2018)

Package Building

One of the central aspects of freight unit building is the package building. Package building supports flexible rule-based creation of single-product and mixed packages. At the same time, it takes constraints such as package attributes, product stacking rules, height requirements, and customer-specific requirements into consideration.

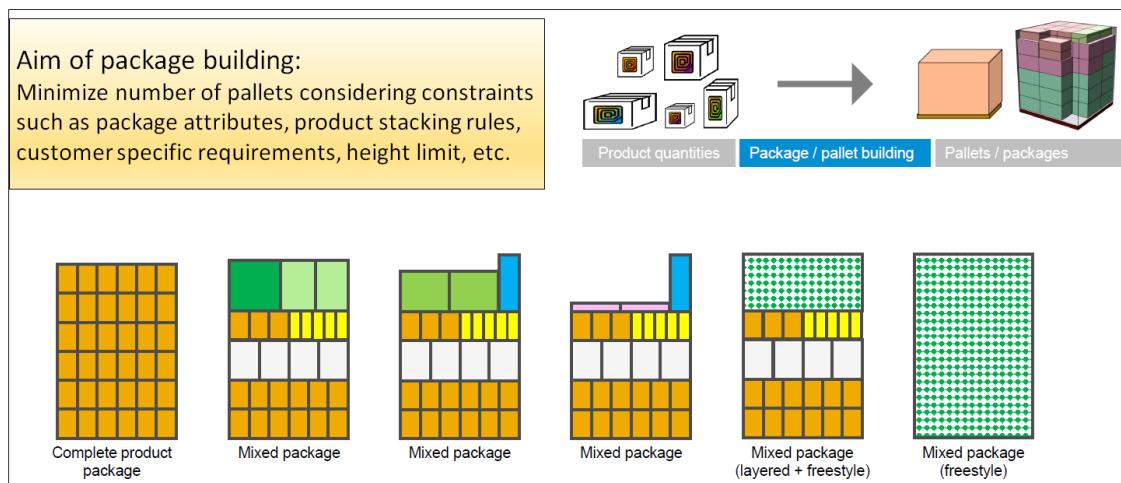


Figure 101: Package Building (Rovang 2018)

3.3.2.2 Transportation Planning

The first step in the transportation planning process is the **creation of freight units**. This means, how to group the goods to be transported in a carrier. This is done based on all transportation requirements, including order-based (purchasing, sales, stock transfer, returns) as well as delivery-based criteria. Examples of criteria for freight unit creation are quantities or attributes and characteristics of the goods to be transported:

- For instance, a standard container (20 feet) can carry around 22 tons of goods. When you have 88 tons of goods to be transported, you need to split the quantity, on 4 standard containers.
- For instance, you need to transport two items from the same sales order which have attributes regarding transportation requirements. One item of the order might be ice cream, which needs to be frozen, while the other item is perishable vegetables, which needs to be refrigerated but must not be frozen. In this case, the two order items should be split into different freight units based on temperature conditions required for transportation in order to avoid both items being loaded into the same compartment of a truck or even on the same truck.

SAP S/4HANA supports the creation of freight units with **Freight Unit Building rules**. These rules allow consolidating freight demand or splitting the planning quantity across freight units via a defined split quantity. Furthermore, **compatibility rules** ensure that freight units with different incoterms or goods with specific transportation restrictions (e.g., refrigerated goods, hazardous materials, liquids) are grouped accordingly.

With SAP TM, in a short-cut process, you can also omit the freight unit creation step and let the system create freight orders directly based on the transportation requirements like sales orders or deliveries.

In addition to the freight unit creation, transportation planning in SAP TM also provides manual, map-based, or automated planning and dynamic replanning functions that consider constraints, utilize real-time location information, to optimize freight planning and tendering. SAP TM helps determining the most efficient combination of modes, routes, resources, and optimal carrier selection by factoring in costs and penalties.

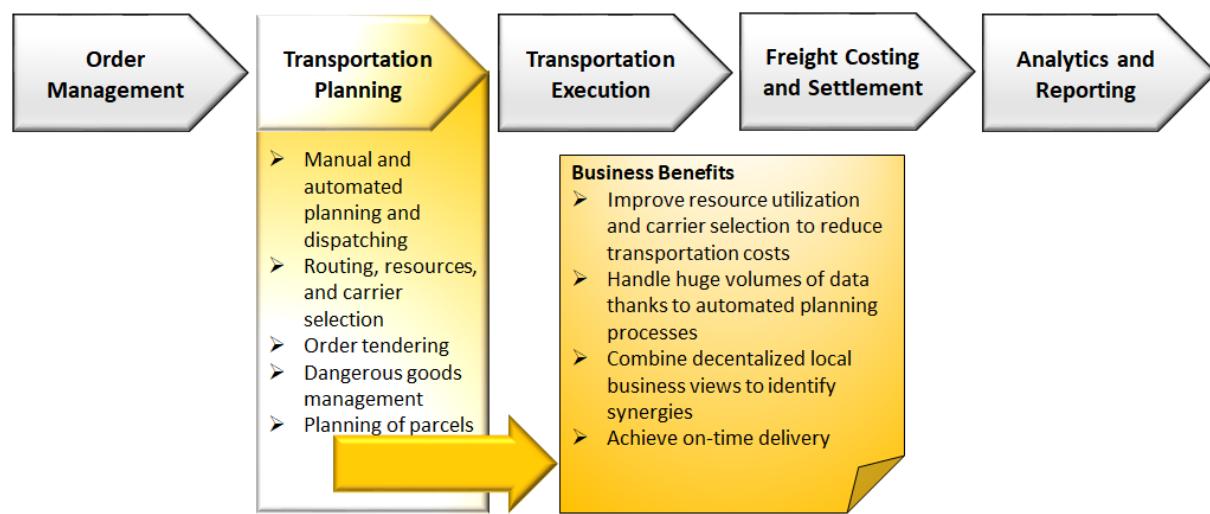


Figure 102: Transportation Planning (Rovang 2018)

Best-in-class Freight Planning Capabilities

The following list Transportation Planning provides, among others, the following capabilities:

- **Drag & Drop functionality for planning:** Freight can be interactively planned and assigned to available resources or schedules using drag & drop functionality.
- **Resource and Vehicle Types:** SAP TM allows planning all available resource and vehicle types. This includes trucks, trailers, compartments, bulk tanks, refrigerated trucks, containers as well as all schedules types for road, ocean, and air freight.
- **Map visualization:** SAP TM comprises standard interfaces for integrating 3rd party geographical information system (e.g., from GIS vendors like PTV, Navteq/Nokia, ALK, RandMcNally, ESRI, etc.). **SAP Visual Business** is an infrastructure to visualize map data and build graphical applications on top of the map visualization. SAP TM uses SAP Visual Business for map-based planning:
 - o route and distance determination
 - o location and route visualization
 - o drag & drop of freight units to lanes and resources.
- **Transportation Cockpit:** With the Transportation Cockpit, users are provided with supporting data to allow them making efficient planning decisions. Tabs can be selected to show related data summaries (e.g. freight order execution status, showing milestone status with traffic light colors and execution times). Additional tabs can display cargo management, carrier ranking, freight execution status, freight charges, etc.
- **Hierarchy View:** The user can work with different hierarchy views (e.g., freight unit, freight order, trailer document, air and ocean bookings). Hierarchies provide a clear, hierarchical display of the freight assignments and activities (e.g., to which documents, locations, stages, loading/unloading of freight units, coupling/uncoupling of tractors and trailers).
- **Optimizer planning:** Constraint- and rule-based planning takes into account the
 - o source and destination locations
 - o pick-up and delivery dates
 - o loading and unloading durations
 - o lane distance and duration
 - o arrival and departure dates
 - o times at each stop via transit duration, length of stay, cargo cut-off time
 - o availability and schedules
- **Least cost transportation:** SAP TM optimizes transportation costs considering fixed and variable costs:

Fixed costs include

 - o vehicle resource
 - o load costs and schedule costs

Variable costs vary according to

 - o transportation time
 - o distance
 - o quantity transported
 - o route
 - o intermediate stops (cost per additional stop)
 - o penalties (early or late pick-up or delivery)

- **Product dimensions:** SAP TM supports all units of measure for weight and volume
- **Resource availability and capacities:** SAP TM supports the handling of
 - o **resources:** loading and unloading, e.g., equipment, forklift truck, door
 - o **vehicles:** weight and cubic capacity, including decreased capacity for partitions
 - o **drivers:** takes into account shifts, downtimes, qualifications
- **Dependencies:** SAP TM ensures linked freight orders, freight units and resources are transported together.
- **Incompatibilities:** SAP TM automatically checks transportation restrictions, e.g. refrigerated goods, hazardous materials, liquids.

Transportation demand <ul style="list-style-type: none"> ✓ Freight units ✓ Building strategies 	Resources & schedules <ul style="list-style-type: none"> ✓ Vehicles, trailers, railcars ✓ Schedules: truck, ocean, air 	Planning constraints <ul style="list-style-type: none"> ✓ Loading / unloading durations ✓ Driver Constraints ✓ Shipping and receiving windows ✓ Dependencies & incompatibilities
---	---	---

The screenshot shows the SAP Transportation Cockpit interface. At the top, there's a navigation bar with tabs like 'Assign Selected Item', 'Transportation Requests', 'Delivery Planning', 'Expansion', etc. Below the navigation is a large table listing delivery requests with columns for ID, Type, Date, Origin, Destination, and various parameters like SP, TT10, USCOU-TM100, and dimensions. To the right of the table is a 'Map Display' tab showing a map of a coastal area with several delivery points marked and connected by a route line. On the left side of the main area, there are two tabs: 'us_Trucks (2)' and 'Schedules (0)'. The 'Schedules' tab is currently active, showing a table with columns for Resource, Description, Means of Transport, Max. Weight, Min. Weight, Volume, Multi., Name, and Project Reference No. Below these tabs is a 'Resource' table with entries for 'Full Truckload' and 'Less Than Truckload'.

Supporting data <ul style="list-style-type: none"> ✓ Carrier ranking ✓ Cargo management ✓ Freight execution ✓ Freight charges etc. 	Map-based visualization & planning <ul style="list-style-type: none"> ✓ 3rd party GIS integration ✓ Map views (tab & full screen) ✓ Drag & drop planning etc. 	Freight documents <ul style="list-style-type: none"> ✓ Hierarchical views ✓ Freight orders & units ✓ Trailer documents & rail ✓ Ocean & air bookings
---	---	---

Figure 103: Best-in-class Freight Planning Capabilities (Rovang 2018)

Visual Loading Planning

The visual load planning functionality allows users to visualize vehicle space and optimize loading based on vehicle attributes (e.g., dimensions and weights), axle weight constraints, stacking rules, and delivery stop sequences.

Further features include

- graphical load visualization
- loading pallets into box trucks, trailers, semi-trailers and containers
- combine packages of different stops into one stack
- create loading list

Figure 104: Visual Loading Planning (Rovang 2018)

Driver Management

The driver management functionality allows users to track and interactively manage driver resources while assigning drivers to specific freight loads using default assignments. Alternatively, the user can do the driver assignment interactively in the transportation planning cockpit or a Gantt chart view.

In SAP TM drivers master data are managed as business partners. You can maintain attributes for drivers in their master data such as non-working times and absences (e.g. vacation, sickness) as well as driver qualifications and validity period.

Drivers can be assigned to road freight orders only as single driver or driver team. Assignment can be done on stage or freight order level.

Figure 105: Driver Management (Rovang 2018)

Carrier Selection and Freight Tendering

The **Carrier Selection** functionality supports users when deciding which carrier to select. The selection process is based on real cost (calculated in charge management) or priorities (defined in the transportation network on transportation lane level). Additional constraints such as allocations, business shares or continuous move considerations can also be incorporated into the decision to select the best carrier.

Tendering is the process of where a company responds to a request for pricing regarding the supply of goods and services from another company. The **Freight Tendering** function of SAP TM supports multivariant tendering (peer-to-peer, broadcast, best price, broadcast, first acceptable offer) and enables communication through B2B, Web-based user interfaces, e-mail, and SMS channels.

In contrast to standalone SAP Transportation Management 9.5, the use of the collaboration portal is currently not supported with SAP S/4HANA Supply Chain for Transportation Management.

The screenshot displays the SAP Freight Order Management interface. On the left, a sidebar titled 'Personalization' shows counts for 'Freight Quotations' (14), 'Freight Orders for Customer' (11), and 'Freight Requests for Supplier' (1). Below this is a 'Personalization Settings' section. The main area is titled 'Freight Requests for Supplier' and shows a table for 'Freight Requests for Supplier (1)'. The table includes columns for 'Request ID', 'Delivery Date', 'Departure Date', 'Departure Location', 'Arrival Location', 'Mode', 'Price', 'Response Required', and 'Accept with Charge'. A 'LBN*' label is visible at the bottom left of the main area. At the bottom right, there is a table titled 'Freight Orders/Freight Bookings (5)' with columns for 'Search', 'Standard', 'Scheduling', 'Carrier Selection', 'Tendering', 'Calculate Charges', 'Destination Location', and 'Departure Date'. The table lists five entries with destination locations like X04_USNEK, WDF_IP_MANNHEIM, LTD_C_OFFENBACH, LTD_C_GERAU, and LTD_C_OFFENBACH, and departure dates ranging from 22.05.2017 to 30.06.2017. A 'LBN*' label is also present here. To the left of the main area, a yellow box contains three sections: 'Rule-based carrier determination', 'Multi-variant tendering', and 'Flexible collaboration'.

Rule-based carrier determination

- Freight agreements
- Costs
- Lane allocation
- Business share

Multi-variant tendering

- Peer-to-Peer RFQ
- Broadcast RFQ
- Direct freight order assignment

Flexible collaboration

- B2B, Email, SMS communication
- Authorization-based RFQ data viewing & processing
- Real-time rendering process, status monitor & dynamic change controller

Figure 106: Carrier Selection and Freight Tendering (Rovang 2018)

3.3.2.3 Transportation Execution

A crucial requirement for implementing an efficient and effective transportation management is the ability to execute a plan and be able to adapt the plan to any event in a dynamic environment. To be able to deliver goods on time in a cost-effective way, while handling delays and disruptions efficiently, requires a well-coordinated planning and execution in transportation management.

Therefore, transport execution in SAP TM provides:

- **Freight execution** and **capacity monitoring** via event management. This includes tracking, with real-time event management features such as map-based geographical tracking, alerts and notifications, and a reporting dashboard.
- **Comprehensive shipment tracking** supports tracking of freight units, freight orders, freight bookings, and containers. Tracking is available across pre-, main- and on-

carriage to support an end-to-end view. Depending on the role in the shipment, different information is presented in shipper, carrier, and consignee views.

- **Flexible communication** is supported among business partners using B2B messaging, mobile apps, Web interfaces, file upload and download, print documents, e-mail, facsimile, and SMS messages. SAP TM offers comprehensive print document templates for road, sea, and air transport.

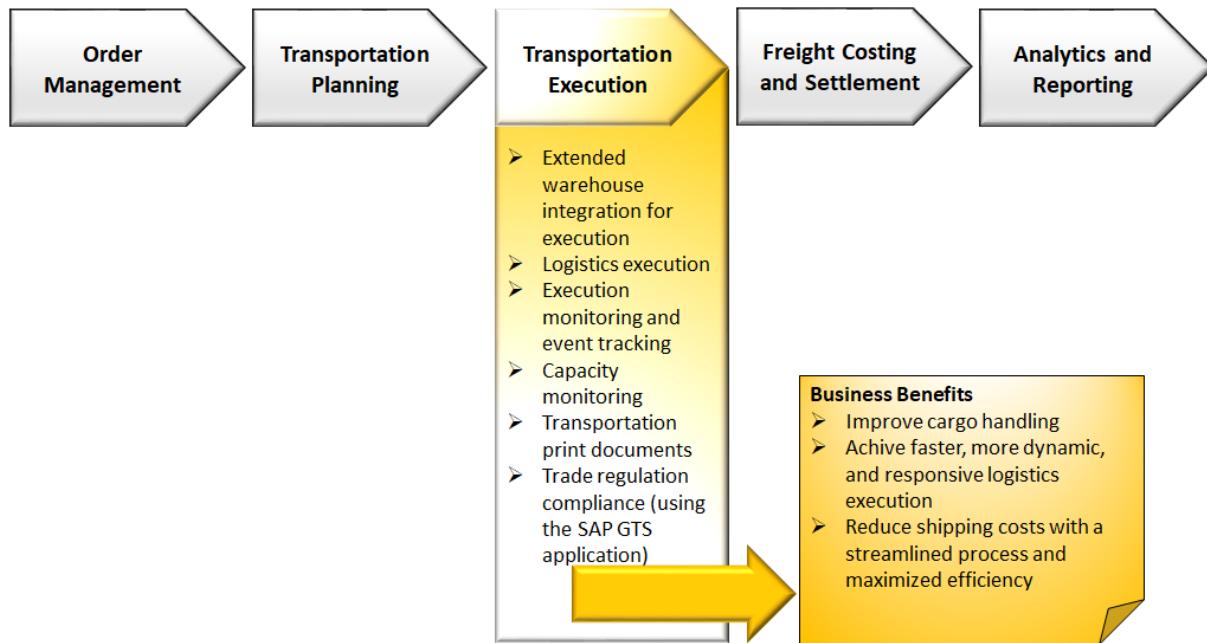


Figure 107: Transportation Execution (Rovang 2018)

In addition, transportation execution in SAP TM is integrated in real time with **SAP Extended Warehouse Management** (via PI). The integration automatically notes changes in freight documents until the freight has been received or loaded, and shares truck arrival and departure information between the two applications.

The integration of SAP TM with SAP EWM supports the following scenarios:

- Order-based planning and execution
- Delivery-based planning and execution
- EWM/TM integration for cost settlement
- Changes in freight documents till the point of arrival and loading
- Communication of arrival and departure information with reversal from EWM to TM

The integration with the **SAP Global Trade Services** application includes trade regulation compliance features for handling export declaration, import declaration, and transit and security filing.

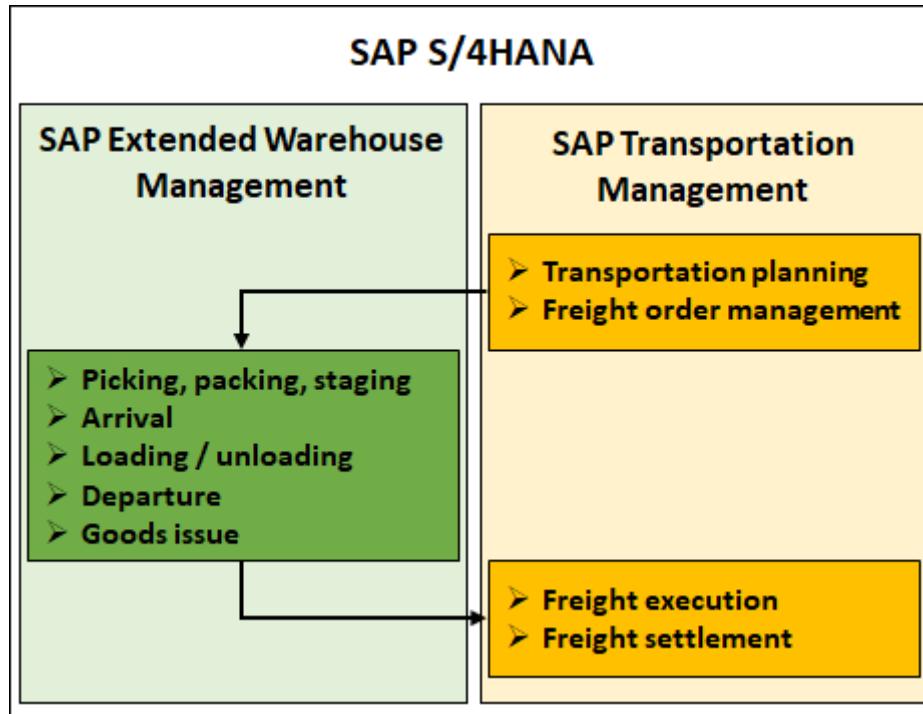


Figure 108: TM Integration with EWM (Rovang 2018)

3.3.2.4 Freight Costing and Settlement

Freight costing allows defining rates based on various criteria. Examples are:

- Different origin/destination point classifications (Country, Region, Zone, ZIP-code, point-to-point, point-to-zip, point-to-state, zip-to-zip and state-to-state)
- Equipment (container type/size)
- Minimum, maximum rates
- Weight/volume, break weight, dimensional weight
- Distance, discounts
- Tolls, taxes, etc.

Rate tables can be maintained in and uploaded from Excel individually and as mass upload. Charges of freight costs can be based on conditions and events (e.g., discount for late deliveries and agreements can be consumed).

Mode-specific capabilities in freight costing and settlement include:

- Rule 11 on freight order (rail)
- Resolution base for resources (rail)
- Railcar-based rating with day-of-week-pricing (rail)
- Resource-ownership-based calculation (rail)
- Commodity-based charges (air and ocean)
- Prepaid and collect on ocean booking (ocean)
- Index table-based fuel surcharge calculation (road, ocean, air)

The process of freight costing and settlement is as follows:

1. Transportation charges and distributed costs are calculated in the freight order and freight booking.

2. Individual or collective processing can trigger the creation of freight settlement documents.
3. The freight settlement document triggers the creation of purchase orders and service entry sheets for transportation services.
4. Purchase order and service entry sheets are then the basis of subsequent invoice verification processes or self-billing processes using standard MM capabilities.
5. The freight settlement document simultaneously triggers postings into CO-PA (outbound) or material valuation (inbound). This part of the process is called cost distribution.

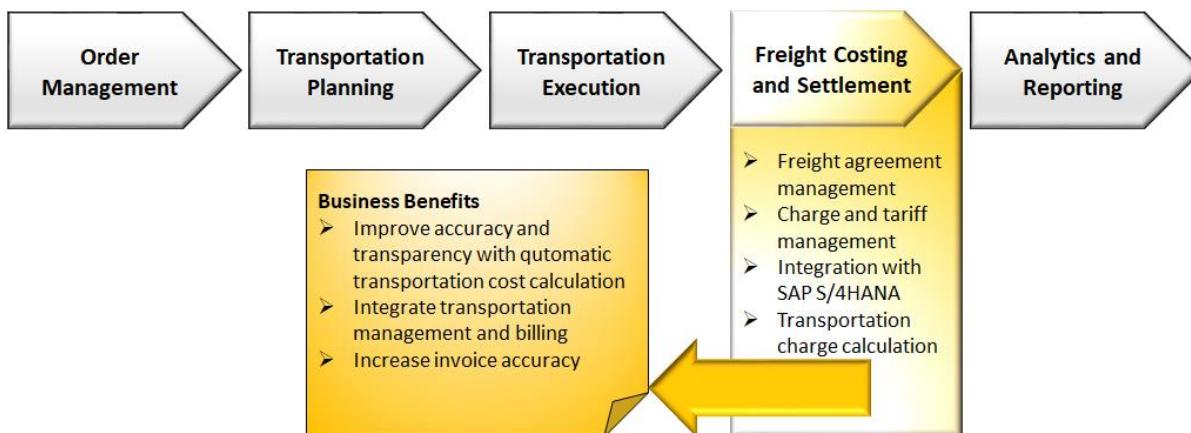


Figure 109: Freight Costing and Settlement (Rovang 2018)

Cost Distribution

The purpose of cost distribution is to:

- record delivery costs on the material for inbound scenario. This includes capitalizing transport costs and increase material value.
- record transport expense on root cause, e.g., sales order for outbound scenario. Thereby, the costs for the transport is distributed to the object that is *responsible* for the transportation requirement.

Cost distribution involves the following steps:

- Distribution of the freight costs at the level of order/delivery items based on distribution rules, such as gross weight of the order/delivery items.
- Processing of the distributed freight costs in the financials for either processing for material valuation or for expensing it at the account assignment of the source item.

3.3.2.5 Document Flow

The following figure illustrates the document flow in SAP S/4HANA TM (embedded). The main difference to a Decentralized Transportation Management – that is, when SAP TM is (like SAP EWM) installed on a separate server and not embedded in SAP S/4HANA – is the simplified document flow.

With Embedded SAP TM, all documents that built the transportation requirements, such as sales orders, purchase orders, deliveries, etc., are directly integrated in the document flow. In the Decentralized SAP TM scenario these documents are replicated as order-based transportation requirement and delivery-based transportation requirement into SAP TM.

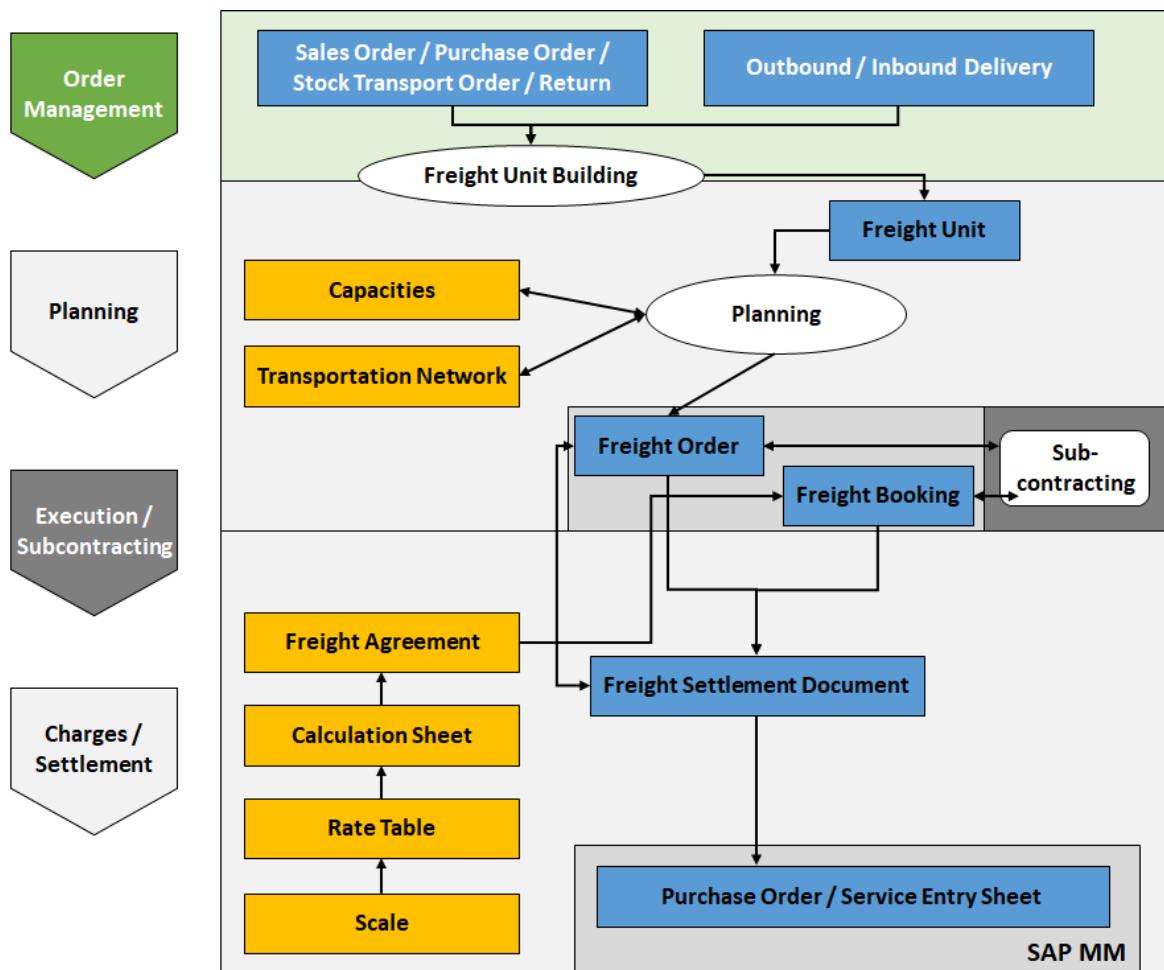


Figure 110: TM Document Flow (Rovang 2018)

3.4 Practice: Lead-to-Cash Business Process



PRACTICE

Your new customer requests 500 Speedstarletts. You will therefore complete the entire Lead-to-Cash business process. This includes the extension of the material master, the creation of the sales order, manufacturing of the product, delivery as well as invoicing and payment.

3.4.1 Sales Order Management

The production facility for the Speedstarletts is in Dallas (plant DL00). However, the distribution center responsible for shipping products to customers is located in San Diego (SD00). Thus, you will need to create the material master of the Speedstarlett in plant SD00 as well.

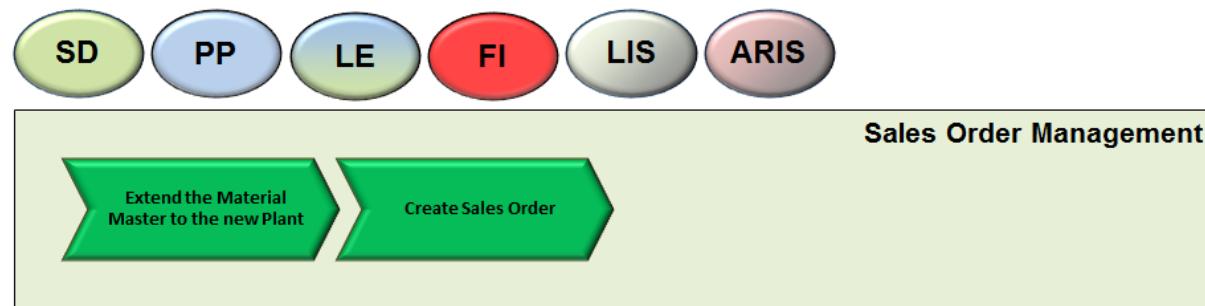


Figure 111: Process Overview: Sales Order Management

3.4.1.1 Extend the Material Master to the New Plant

In order to be able to process the Speedstarlett in the San Diego (SD00) plant within the SAP S/4HANA System, the material master must be extended to the new plant. Therefore, the required views of the material master are created in the new plant by copying them from the same views available for the organizational levels of plant DL00.

Scroll down to the tile group **Script 3- Lead-to-Cash** and open the app *Create Material*.

1. Enter material **Speedstarlett-xxxx** and industry sector **Mechanical engineering**. Enter **material type Finished Product**. Enter the **Speedstarlett-xxxx** in the field **Copy from...Material** as well and confirm with *Enter*.
Select the following views:
 - **Sales: Sales Org. Data 1 and 2**
 - **Sales: General/Plant Data**
 - **MRP 1-4**
 - **General Plant Data / Storage 1 and 2**
 - **Warehouse Management 1 and 2**
 - **Accounting 1**
 - Press **Org. Levels**

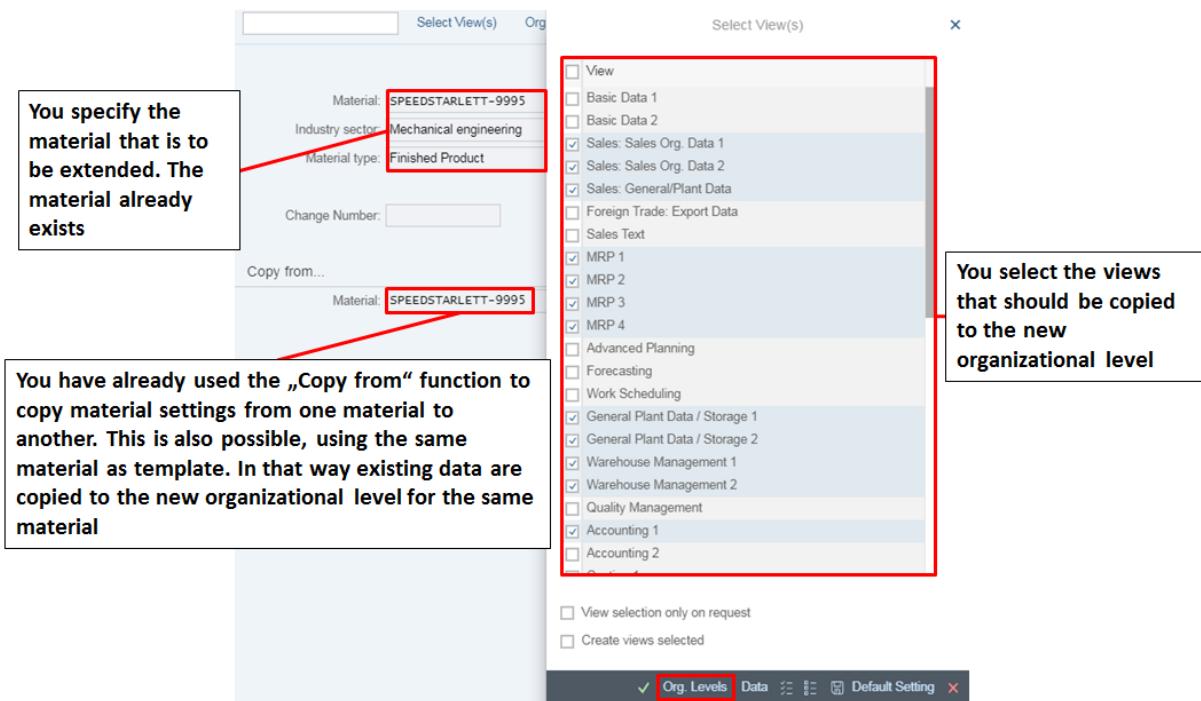


Figure 112: Extend Material Master to new Organizational Level (1): SAP-System-Screenshot

2. In the **Organizational Levels** section, enter:

Organizational levels		Copy from	
Plant	<i>SD00</i>	Plant	<i>DL00</i>
Storage Location	<i>FG00</i>	Storage Location	<i>FG00</i>
Sales Org.	<i>UW00</i>	Sales Org.	<i>UW00</i>
Distr. Channel	<i>WH</i>	Distr. Channel	<i>WH</i>
Warehouse Number	<i>100</i>	Warehouse number	
Storage Type	<i>005</i>	Storage type	

Press

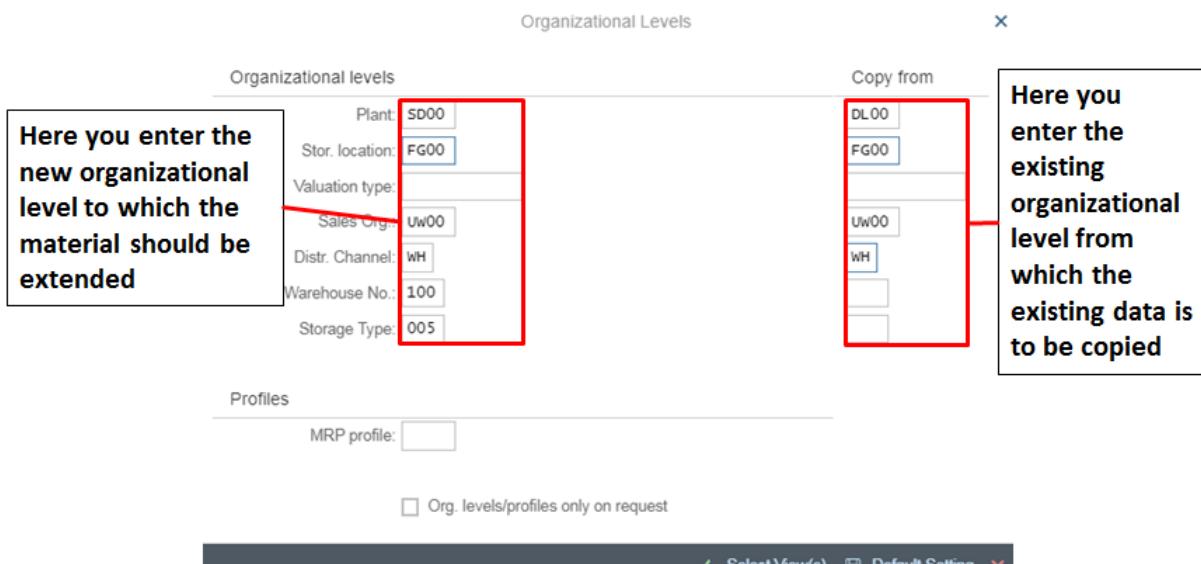


Figure 113: Extend Material Master to new Organizational Level (2): SAP-System-Screenshot

Pay attention to the notification in the status bar *Material already exists and will be extended.*

3. **Sales: sales org. 1:** Change the Delivering Plant to **SD00**. Confirm with *Enter*.

The screenshot shows the SAP interface for extending material master data. The top navigation bar has tabs for 'Basic data 1', 'Basic data 2', and 'Sales: sales org. 1'. Under 'Sales: sales org. 1', there are fields for Material (SPEEDSTARLETT-9995), Descr. (Speedstarlett-9995), Sales Org. (UW00), US West, Distr. Chl. (WH), Wholesale, and a note about 'Wholesale'. Below this is a 'General data' section with fields for Base Unit of Measure (EA), Sales unit, Unit of Measure Grp, X-distr.chain status, DChain-spec. status, Delivering Plant (SD00), Plant Dallas, Material Group, and Cash Discount (checked).

Figure 114: Extend Material Master to new Organizational Level (3): SAP-System-Screenshot

4. **Sales: sales org. 2:** Press *Enter* to copy the entries and skip to the next view.
5. **Sales: General/Plant:** Press *Enter* to copy the entries and skip to the next view.
6. **MRP 1:** Delete any entry in the **MRP group** field. Then, press *Enter* to copy the entries and skip to the next view.
7. **MRP 2:** Press *Enter* to copy the entries and skip to the next view.
8. **MRP 3:** Press *Enter* to copy the entries and skip to the next view.
9. **MRP 4:** Press *Enter* to copy the entries and skip to the next view.



The system notifies, that production versions of the reference material have not been adopted. This can be skipped with Enter. Since our Speedstarlett is only produced in plant DL00, production versions in plant SD00 are not necessary.

NOTE

10. **Plant data / stor. 1:** Press *Enter* to copy the entries and skip to the next view.
11. **Plant data / stor. 2:** Press *Enter* to copy the entries and skip to the next view.
12. **Warehouse Management 1:** Enter the following data:
 - Picking storage type 005
 - Stock removal 001
 - Storage Section Ind. 001
 - Stock placement 001Confirm with *Enter*

The screenshot shows the SAP Material Master screen. In the General data section, the Picking storage type field (005) is highlighted with a red box. A callout box contains the text: "The Storage Strategies determine how the Warehouse Management System handles the material within transfer orders". In the Storage strategies section, the Stock removal and Storage Section Ind. fields (both 001) are also highlighted with red boxes.

Figure 115: Extend Material Master to new Organizational Level (4): SAP-System-Screenshot

13. **Warehouse Management 2:** Press *Enter* to copy the entries and *save* your entries when prompted (After pressing *Enter* in view Accounting 1, whereby the message regarding currency conversion can be confirmed with Enter, too).

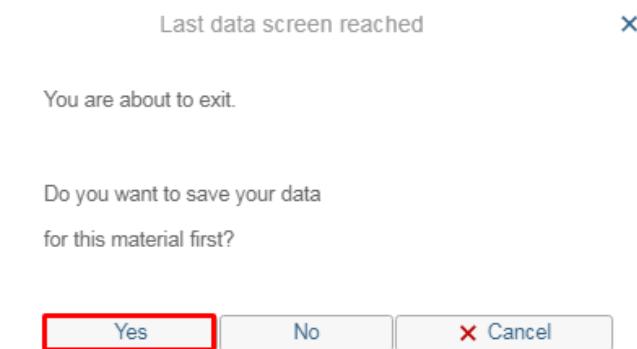


Figure 116: Extend Material Master to new Organizational Level (5): SAP-System-Screenshot

3.4.1.2 Create Sales Order

Now that the material has been created for the plant in San Diego, you can create a sales order for the customer.

To enter a sales order for your customer, scroll down to the tile group **Script 3- Lead-to-Cash** and open the app **Manage Sales Orders**. Then, click on **Create Sales Order** button.

1. Enter Order Type **OR (Standard Order)**. Clear all other fields (**Sales Organization, Distribution Channel, and Division**)! Confirm with *Enter*.
2. On the *Create Standard Order: Overview* page, enter:

- **Sold-to Party** *your customer number* from the datasheet
 - **Cust. Reference** *xyyy-Order*
Press *Enter*.
3. A new window pops up. You are prompted to select a Sales area, since the reference to a Sales area is mandatory in a sales document. Select Sales area **UW00/WH/BI** by double-clicking on the row.

The screenshot shows the SAP Create Sales Order interface. At the top, there are fields for Standard Order (empty), Net Value (0.00), Sold-To Party (25015), Ship-To Party (empty), Cust. Reference (9995-Order), and Cust. Ref. Date (empty). Below this is a navigation bar with tabs: Sales (selected), Item overview, Item detail, Ordering party, Procurement, Shipping, and Reason for rejection.

In the main area, there are several input fields: *Req. Deliv.Date (D 20.10.2017), Deliver.Plant (empty), Complete Dlv. (checkbox), Delivery Block (empty), Billing Block (empty), Card type (empty), Card Verif.Code (empty), Pyt Terms (empty), Inc. Version (empty), Incoterms (empty), and Inc. Location1 (empty). To the right of these fields is a note: "Sales area for customer".

Below these fields is a table titled "SORG DC DV Description". It contains two rows of data:

SORG	DC	DV	Description
UW00	IN	BI	US West / Internet / Bicycles
UW00	WH	BI	US West / Wholesale / Bicycles

A callout box points to the second row with the text: "Double-click on the row with sales area UW00/WH/BI". To the right of the table is a callout box containing the following text:

- You have created the customer master data for two Sales Areas
- EVERY Sales document is created with reference to a Sales Area
- You have not specified the Sales Area for this Sales Order yet (you canceled the specific fields in the initial screen)
- Thus, the system proposes all Sales Areas to choose from

Figure 117: Create Sales Order - Select Sales Area: SAP-System-Screenshot

4. Now enter the following data:
- **Req. deliv. date** 15th of the next month
 - **Material** *Speedstarlett-xyyy*
 - **Order Quantity** *500*
 - Confirm with *Enter* and skip the following notifications by pressing *Continue*.
 - If the *Standard Order: Availability Control* screen appears, press within the *Complete Delivery* area.

The system fills in several additional data. The following figure illustrates the interactions between customer master, material master and sales conditions using a fictive example.

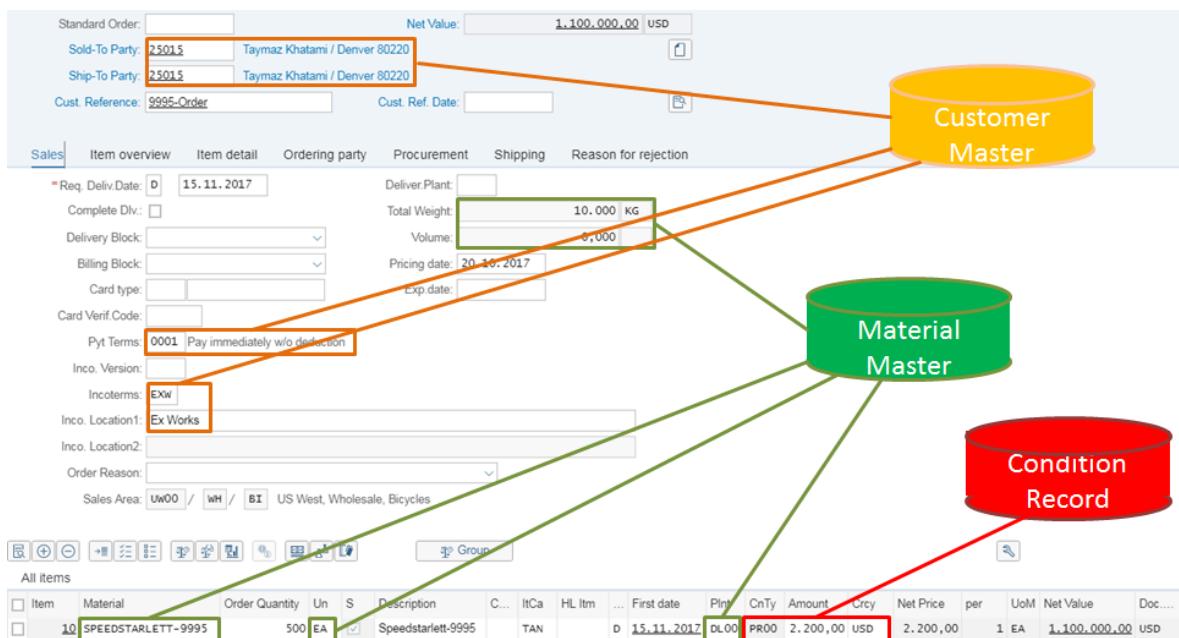


Figure 118: Master Data Interaction: SAP-System-Screenshot

5. Select the entered row with the material (**Item 10**) and choose the icon (**Item conditions**).

For comparison:

The following figure shows item data of the sales order, created by the participant with USER-number 9995.

The screenshot shows the SAP Sales Order screen with the 'Conditions' tab selected. The table lists pricing elements for Item 10 SPEEDSTARLETT-9995. The table has columns: I..., CnTy, Name, Amount, Crcy, per, UoM, Condition Value. The rows include: Price (PR00), Gross Value, Discount Amount, Rebate Basis, Net Value for Item, Net Value 2, Total, Cash Discount (SKTO), Internal price (VPRS), and Standard - USA With. A callout box points to the Price row with the text: 'Pricing condition PRO0, derived from the customer-product-specific condition record you maintained earlier'. Another callout box points to the Total row with the text: 'Income per unit and total income from this order'. A third callout box points to the Standard - USA With row with the text: 'Cost per unit (from cost estimate) and total cost of production for this order'. A fourth callout box points to the Profit per unit and total profit of the order with the text: 'Profit per unit and total profit of the order'.

Figure 119: Create Sales Order: Pricing Elements: SAP-System-Screenshot

6. Save the sales order and list the sales order number on your data sheet.

Sales Order Number:



Subsequent changes regarding the sales order can be made via transaction code VA02 (Change Sales Order)

NOTE

7. Leave the transaction by pressing **Exit**.

3.4.2 Material Requirements Planning

After entering the sales order, you want to start production. Check which materials are required for the production of the Speedstarlett to carry out required orders.

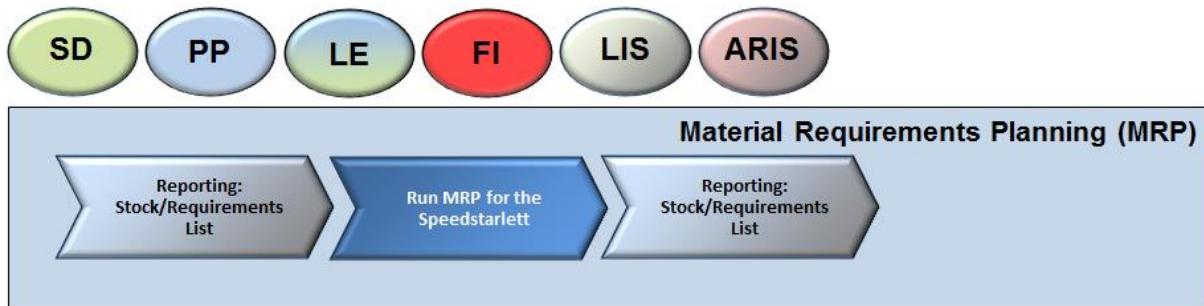


Figure 120: Process Overview: Material Requirements Planning (MRP)

3.4.2.1 Reporting: Display Stock/Requirements List

Briefly check the MRP status. You are already familiar with MRP in SAP S/4HANA from the **Plan-to-Produce** case study. At this point, you will only check which materials are in stock and whether there are material shortfalls or not. To check the MRP status, scroll down to the tile group **Script 3- Lead-to-Cash** and open the app **Monitor Stock / Requirements List**.

1. Enter your material **Speedstarlett** (*Speedstarlett-xxxx*) and plant **Dallas** (*DL00*). Confirm with **Enter**.
2. You are already familiar with this screen from the **Plan-to-Produce** unit. You can see the individual planned orders (PldOrd.) created by the MRP run. You can also see the new sales order of 500 units.



Consider, that dependent on your previous results the values within the Available Quantity column may differ. At this point it is only important that for the sales orders the values in the Receipt/Requirement column are equal to the following figure.

The screenshot shows the SAP interface for the Stock/Requirements List. The top bar includes fields for Material (SPEEDSTARLETT-9995), MRP area (DL00), Plant (DL00), MRP type (PD), Material type (FERT), and Unit (EA). Below the header is a toolbar with various icons. The main area is a table with columns: Date, MRP ..., MRP element data, Rescheduli..., ... (partially visible), Receipt/Reqmt, and Available Qty. Two specific rows are highlighted with red boxes:

Date	MRP ...	MRP element data	Rescheduli...	... (partially visible)	Receipt/Reqmt	Available Qty
20.10.2017	Stock				500-	500-
15.11.2017	CusOrd	000000036/000010/...			500-	500-
01.12.2017	PldOrd	0000000833/STCK	15.11.2017	30	880	380
01.12.2017	IndReq	VSF			380-	0
01.01.2018	PldOrd	0000000834/STCK			478	478
01.01.2018	IndReq	VSF			478-	0
15.01.2018	PldOrd	0000000835/STCK			100	100
15.01.2018	CusOrd	000000035/000020/...			100-	0
01.02.2018	PldOrd	0000000836/STCK			382	382

Two boxes highlight specific rows: one labeled "Order from this teaching unit" covers the first two rows (Stock and CusOrd on 15.11.2017); another labeled "Order from teaching unit 2" covers the last two rows (PldOrd on 15.01.2018 and CusOrd on 15.01.2018).

Figure 121: Sales Order in Stock/Requirements List: SAP-System-Screenshot

3. Also check the quantities in stock for the **Basis-module2-xxxx**. The following figure shows the dependent requirements regarding **Basis-module2** merely for the old sales order and old planned orders. You **cannot** find the dependent requirement of 500 units for Basis-module2 in this figure.

Material: BASIS-MODULE2-9995							
Basis-Module2-9995							
MRP area: DL00		DC Dallas		Plant: DL00		MRP type: PD	
Material type: HALB							
Σ	68	>Edit	Print	Date	MRP ...	MRP element data	R...
...	Date	MRP ...	MRP element data	R...	... Receipt/Reqmt	Available Qty	Pro...
	20.10.2017	Stock				0	
	26.11.2017	PldOrd	0000000840/STCK		880	880	0000
	26.11.2017	DepReq	SPEEDSTARLETT-9995		880-	0	
	27.12.2017	PldOrd	0000000841/STCK		478	478	0000
	27.12.2017	DepReq	SPEEDSTARLETT-9995		478-	0	
	10.01.2018	PldOrd	0000000842/STCK	52	100	100	

Figure 122: No Dependent Requirement (1): SAP-System-Screenshot

Also check the components **Gearing-xxxx**, **Wheel-xxxx** and **Alu-Frame-xxxx**. You can see the purchase requisitions that cover the dependent requirements (DepReq). For the components (except for ALU-Frame), you can see that materials are already in stock. They were already ordered in the *Plan-to-Produce* case study. You can also see that **no** purchase requisitions and **no** reservations were carried out **by the new sales order (with reference to the new sales order)**. Therefore, you need to carry out MRP once again to update the stock/requirements list.

Material: GEARING-9995							
Gearing-9995							
MRP area: DL00		DC Dallas		Plant: DL00		MRP type: ROH	
Material type: ROH							
Σ	68	Edit	Print	Date	MRP ...	MRP element data	R...
...	Date	MRP ...	MRP element data	R...	... Receipt/Reqmt	Available Qty	Stor...
	20.10.2017	Stock			880	0	FG00
	23.11.2017	DepReq	BASIS-MODULE2-9995		880-	0	FG00
	24.11.2017	PurReq	0010000297/00010	1.245	1.245	FG00	
	24.12.2017	DepReq	BASIS-MODULE2-9995	767-	478	FG00	
	24.12.2017	DepReq	BASIS-MODULE2-9995	478-	0	FG00	

Material: WHEEL-9995							
Wheel-9995							
MRP area: DL00		DC Dallas		Plant: DL00		MRP type: ROH	
Material type: ROH							
Σ	68	Edit	Print	Date	MRP ...	MRP element data	R...
...	Date	MRP ...	MRP element data	R...	... Receipt/Reqmt	Available Qty	Stor...
	20.10.2017	Stock			1.560	0	FG00
	26.11.2017	DepReq	SPEEDSTARLETT-9995		1.760-	200-	FG00
	27.12.2017	PurReq	0010000288/00010	26...	2.490	2.290	FG00
	27.12.2017	DepReq	SPEEDSTAR-9995		1.534-	756	FG00
	27.12.2017	DepReq	SPEEDSTARLETT-9995		956-	200-	FG00
	10.01.2018	PurReq	0010000289/00010	27...	400	200	FG00
	10.01.2018	DepReq	SPEEDSTAR-9995		200-	0	FG00
	10.01.2018	DepReq	SPEEDSTARLETT-9995		200-	200	FG00

Material: ALU-FRAME-9995							
Alu-Frame-9995							
MRP area: DL00		DC Dallas		Plant: DL00		MRP type: ROH	
Material type: ROH							
Σ	68	Edit	Print	Date	MRP ...	MRP element data	R...
...	Date	MRP ...	MRP element data	R...	... Receipt/Reqmt	Available Qty	Stor...
	20.10.2017	Stock			880	880	FG00
	23.11.2017	PurReq	0010000294/00010		880-	0	FG00
	23.11.2017	DepReq	BASIS-MODULE2-9995		880-	0	FG00
	24.12.2017	PurReq	0010000295/00010		478	478	FG00
	24.12.2017	DepReq	BASIS-MODULE2-9995		478-	0	FG00

Figure 123: No Dependent Requirement (2): SAP-System-Screenshot

3.4.2.2 Run MRP for the Speedstarlett

Carry out MRP for the entire BOM of the product *Speedstarlett-xyyy* in plant **DL00**. Therefore, scroll down to the tile group **Script 3- Lead-to-Cash** and open the app **Schedule MRP Runs**.

1. Click on the **New** button and enter the following data:

- Job Template	Material Requirements Planning (MRP)
- Job Name	Material Requirements Planning (MRP)
- Start Immediately	select
- Plant	DL00
- Material	Speedstarlett-xyyy
- MRP controller	000
- BOM Components	select
- Scheduling	1
- Planning Mode	3
2. Choose **Schedule** and leave the current view ().

3.4.2.3 Reporting: Display Stock/Requirements List

Display the stock/requirements list for the Speedstarlett-xyyy in plant DL00 once again. Therefore, scroll down to the tile group **Script 3- Lead-to-Cash** and open the app **Monitor Stock / Requirements List**.



As you know from script 2, scheduling of Speedstarlett may take 2-3 minutes.

NOTE

Now you can see that the sales order created a new planned order and that the planned order for the planned independent requirements was reduced exactly by the quantity of the sales order requirements. In this scenario, the planned order with the amount of 880 was reduced to 380 and a new planned order with 500 was created.

Thus, it is ensured that planned independent requirements, which are used to forecast sales orders, are set off against these sales orders when they actually occur.



Depending on various factors (e.g. time interval between the processing of two case studies) your data may differ from the figure above. In this case, you can adjust the respective data manually. Therefore, double-click the first planned order and select . Change the order quantity to 500 and save. Then, open the Stock / Requirements List again. Now, a planned order with quantity 500 should be available in your stock list.

Also open your Basis-Module2 and Alu-Frame in MD04. Check whether a planned order with 500 as quantity is available within the stock list. If not, change the quantity of the first planned order / purchase requisition to 500 and refresh the list.

The screenshot shows the SAP Stock/Requirements List for material SPEEDSTARLETT-9995. The header information includes Material: SPEEDSTARLETT-9995, MRP area: DL00, DC Dallas, Plant: DL00, and MRP type: PD. A callout box on the left states: "Now the MRP run has updated the Stock/Requirements list by creating a new Planned Order for the current Sales Order." Another callout box on the right states: "Also note that the Sales Order consumes the existing Independent Requirements and Planned Orders." The table lists the following planned orders:

Date	MRP ...	MRP element data	Reschedule...	... Recop/Reqmt	Available Qty	Pro...	Stor...
20.10.2017	Stock				0		
15.11.2017	PldOrd	0000000847/STCK		500	500 0000	FG00	
15.11.2017	CusOrd	0000000036/00001...		500-	0		
01.12.2017	PldOrd	0000000848/STCK		380	380 0000	FG00	
01.12.2017	IndReq	VSF		380-	0		
01.01.2018	PldOrd	0000000849/STCK		478	478 0000	FG00	
01.01.2018	IndReq	VSF		478-	0		

Figure 124: Planned Orders in Stock/Requirements List: SAP-System-Screenshot

Next, create the two production orders (**Basis-Module2** and **Speedstarlett**).

3.4.3 Producing the Speedstarlets

In the previous steps, you noticed that you do not have sufficient finished products in stock to cover the planned independent requirements. Consequently, you must produce the required number of racing bicycles. **Therefore, create a production order.**

The planned order already contains all necessary information, e.g., the materials to be produced, the BOM, the routing and important dates. Now you need to transform the planned order into a production order.

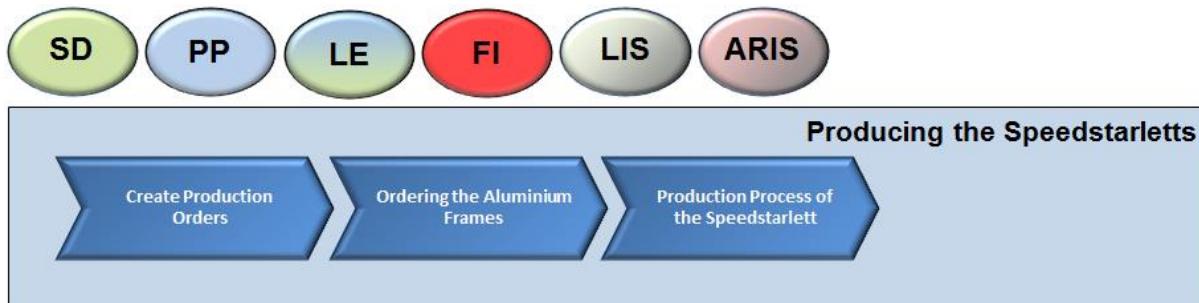


Figure 125: Process Overview: Producing the Speedstarlets

3.4.3.1 Create Production Orders

Start with the Basis-module2. Therefore, scroll down to the tile group **Script 3- Lead-to-Cash** and open the app **Monitor Stock / Requirements List**.

1. Select **material Basis-Module2-xxxx** and **plant Dallas (DL00)**. Choose **Enter**.
2. Double-click the row containing the planned order (**PldOrd**) with **500** units.
3. The screen **Additional Data for MRP Element** is displayed. Click the **> Prod.Old.** button (**Convert Planned Order to Production Order**).

The screenshot shows the SAP MRP Basis-Module2 interface. At the top, it displays material information: Material: BASIS-MODULE2-9995, Basis-Module2-9995, MRP area: DL00, DC Dallas, Ex. manuf.: [empty], Plant: DL00, MRP type: PD, Material type: HALB, Unit: EA. Below this is a grid table with columns: Date, MRP ... (highlighted with a red box), MRP element data, Receipt/Reqmt, Available Qty, Pro... (highlighted with a red box), Stor... (highlighted with a red box). The rows show data for 20.10.2017 (Stock), 10.11.2017 (PldOrd), and 10.11.2017 (DepReq). The PldOrd row has a highlighted quantity of 500. The bottom section shows additional data for MRP Element: Plnd Order: 0000000855, Order End Date: 10.11.2017, GR pr.time: 0, Order Qty.: 500, Order Start: 07.11.2017, Proc. type: E, Scrap: 0, Opening Date: 06.11.2017, Order Type: LA. A navigation bar at the bottom includes buttons: > Prod.Old. (highlighted with a red box), > PartConvProdOrder, > Proc.Old., > SubProcOrd, > Pur.Req., and a star icon.

Figure 126: MRP Basis-Module2: SAP-System-Screenshot

4. The system transfers the data from the planned order to create a new production order. Check the availability of the required items by clicking the **Material** icon (**material**).

- Click the **Missing Parts Overview** button. You can see that only the stock of aluminum frames is not sufficient. Select the -button to return to the **Production order Create: Header** screen.

Item	Material	Requirement Date	Requirement quantity	B...	Batch	Acti...	Sto...
0010	ALU-FRAME-9995	20.10.2017	500	EA		0010	FG00

Figure 127: Missing Part Overview for Basis-Module2: SAP-System-Screenshot



If more material is missing (e.g. gearings), you did not order enough material in previous parts. In this case order the missing (or more) material as you have learned before. That means create a purchase order and then post goods receipt. All necessary steps are described in case study 2 (Plan-to-Produce).

- Release the order (the order **Status** is currently **CRTD** – created) by clicking the **Release Order** symbol. If necessary, click on the button within the popup. The system confirms the order release in the status bar. The order status changes to **REL** (released).
- Save the production order and list its number:

Production Order 1 (Basis-Module2):

- Leave the current view and within the tile group **Script 3- Lead-to-Cash** select the app **Monitor Stock/ Requirements List** again. Enter your **Basis-Module2-xyyy** as **Material** and **DL00** as **Plant**. Instead of the planned order, the system displays the production order (**Prod.Org.**).

MRP area:	DL00	DC Dallas	Ex. manuf.:						
Plant:	DL00	MRP type:	PD						
		Material type:	HALB						
<input type="button" value="Σ"/>	<input type="button" value="68"/>	<input type="button" value=">Edit"/>	<input type="button" value="Print"/>	<input type="button" value="Date"/>	<input type="button" value="GR"/>	<input type="button" value="ST On"/>	<input type="button" value="On"/>	<input type="button" value="Vendor"/>	<input type="button" value="Cust."/>
...	Date	MRP ...	MRP element data	Rescheduli...	...	Receipt/Reqmt	Available Qty	Pro...	Stor...
<input type="button" value="Q"/>	20.10.2017	Stock					0		
<input type="button" value="Q"/>	10.11.2017	DepReq	SPEEDSTARLETT-9995			500-	500-	FG00	
<input type="button" value="Q"/>	26.11.2017	PldOrd	0000000856/STCK			380	120- 0000	FG00	
<input type="button" value="Q"/>	26.11.2017	DepReq	SPEEDSTARLETT-9995			380-	500-	FG00	
<input type="button" value="Q"/>	27.12.2017	PldOrd	0000000857/STCK			478	22- 0000	FG00	
<input type="button" value="Q"/>	27.12.2017	DepReq	SPEEDSTARLETT-9995			478-	500-	FG00	
<input type="button" value="Q"/>	10.01.2018	PldOrd	0000000858/STCK	52		100	400-	FG00	
<input type="button" value="Q"/>	10.01.2018	DepReq	SPEEDSTARLETT-9995			100-	500-	FG00	
<input type="button" value="Q"/>	16.01.2018	PrdOrd	000001000043/PP01/...	10.11.2017 10		500	0 0000	FG00	
<input type="button" value="Q"/>	27.01.2018	PldOrd	0000000859/STCK	52		382	382	FG00	
<input type="button" value="Q"/>	27.01.2018	DepReq	SPEEDSTARLETT-9995			382-	0	FG00	
<input type="button" value="Q"/>	24.02.2018	PldOrd	0000000860/STCK	52		618	618	FG00	

Figure 128: Production Order for Basis-Module2: SAP-System-Screenshot

Next, create the second production order. Again, this refers back to the first planned order created for the Speedstarlett. Therefore, scroll down to the tile group **Script 3- Lead-to-Cash** and open the app **Monitor Stock / Requirements List**.

1. Select **material Speedstarlett-xxxx** and **plant Dallas (DL00)**. Choose *Enter*.
2. Double-click the row containing the planned order (**PldOrd**) with **500** units for your new sales order.
3. The screen **Additional Data for MRP Element** is displayed. Click the **> Prod.Old.**-button (**Convert Planned Order to Production Order**). Skip a possible message regarding the document Speedstarlett-xxxx with “**Yes**“.

Plnd Order:	0000000847	Make-to-stock	Order End Date:	15.11.2017	GR pr.time:	0
Order Qty.:	500	EA	Order Start:	10.11.2017	Proc. type:	E
Scrap:	0		Opening Date:	09.11.2017	Order Type:	LA
> Prod.Old. -> PartConvProdOrder -> Proc.Old. -> SubProcOrd -> Pur.Req. ★ ✕						

Figure 129: Planned Order for the Speedstarlett: SAP-System-Screenshot

4. The system transfers the data from the planned order and creates a new production order. You can see that the status of this order is CRTD, that the quantity was transferred from the planned order and that a finish date is stated.
5. Release the order by clicking the **Release Order** symbol. If necessary, click on the **Release Order**-button within the popup.
6. Save the production order and list its number:

Production Order 2 (Speedstarlett):

7. Leave the current view and within the tile group **Script 3- Lead-to-Cash** select the app **Monitor Stock/ Requirements List** again. Enter your **Speedstarlett-xxxx** as **Material** and **DL00** as **Plant**. Instead of the planned order (if necessary, scroll down), the system displays the production order (**Prod.Ord.**).

Date	MRP element data	Receipt/Reqmt	Available Qty
20.10.2017	Stock		0
15.11.2017	CusOrd 0000000036/000010/...	500-	500-
01.12.2017	PldOrd 0000000848/STCK	380	120- 0000 FG00
01.12.2017	IndReq VSF	380-	500-
01.01.2018	PldOrd 0000000849/STCK	478	22- 0000 FG00
01.01.2018	IndReq VSF	478-	500-
15.01.2018	PldOrd 0000000850/STCK	100	400- 0000 FG00
15.01.2018	CusOrd 0000000035/000020/...	100-	500-
16.01.2018	PrdOrd 000001000044/PP01/... 1... 10	500	0 0000 FG00
01.02.2018	PldOrd 0000000851/STCK	382	382 0000 FG00
01.02.2018	IndReq VSF	382-	0

Figure 130: Production Order for the Speedstarlett: SAP-System-Screenshot

3.4.3.2 Ordering the Aluminum Frame

For the production of the Speedstarlett, the only item missing is the aluminum frame because if you completed case study 2 properly, a sufficient quantity of all other materials was ordered already. First, create a purchasing info record and then, create a purchase order for the aluminum frame.

3.4.3.2.1 Create Purchasing Info Records and Conditions

Create a purchasing info record and a condition record for the aluminum frame. Therefore, scroll down to the tile group **Script 3- Lead-to-Cash** and open the app **Create Purchasing Info Record**.

1. Enter the **number of your vendor** from the Purchase-to-Pay case study (alternatively you can use the F4 help function) in the **Vendor** field. **Material** is the aluminum frame (**Alu-Frame-xxxx**), **Purchasing Organization** is **GBI US (US00)** and **Plant** is **Dallas (DL00)**. Leave the **Info Record** field empty and confirm with **Enter**.
2. You see the *Create Info Record: General Data* screen. Some data were already transferred from the material master. You do not need to change them. Click the **Purch. Org. Data 1** symbol.
3. Enter a **Standard Quantity** of **100 (EA)** and a **Net price** of **250 USD** per unit. Click the **Conditions** symbol.
4. Select the line containing **condition type PB00** and click on **Scales**.
5. Configure the condition so that the **price** is **250 USD** from a **Scales quantity** of **1 piece** and that from a **Sales quantity** of **500**, the **price** is **200 USD**.

	Header Data	Details	Additional Data	Scales	Validity Periods	Free Goods
Variable key						
Vendor	Material		POrg	Plant	Cat	Description
125020	ALU-FRAME-9995		US00	DL00	0	Standard
Validity						
*Valid From: 20.10.2017		*Valid to: 31.12.9999				
<input type="button"/>						
Condition supplements						
<input checked="" type="checkbox"/>	CnTy	Name	Amount	Unit	per	UoM
<input checked="" type="checkbox"/>	PB00	Loss Price	250,00	USD	1	EA
Variable key						
Vendor	Material		POrg	Plant	Cat	
125020	ALU-FRAME-9995		US00	DL00	0	
Validity						
*Valid From: 20.10.2017				Scale Basis: <input type="checkbox"/> Quantity scale		
*Valid to: 31.12.9999				Check: <input type="checkbox"/> None		
<input type="button"/>						
Scales						
Scale Type	Scale quantity	* ...	Amount	* Unit	* per	* UoM
From	1 EA		250,00	USD	1 EA	
	500				200	

Figure 131: Create Condition Record for Alu-Frame: SAP-System-Screenshot

6. **Save** your entries and list the number of the info record. Finally, press **Exit**.

Purchasing Info Record (Aluminum Frame):

3.4.3.2.2 Create Purchase Order

To create the order, scroll down to the tile group **Script 3- Lead-to-Cash** and open the app **Monitor Stock / Requirements List**.

1. Select **material aluminum frame (Alu-Frame-xyyy)** and **plant Dallas (DL00)**. Confirm with **Enter**.
2. Double-click the line containing the purchase requisition with the quantity **500**.
3. The screen **Additional Data for MRP** appears. Click the **> Purchase Order** icon to create a purchase order.

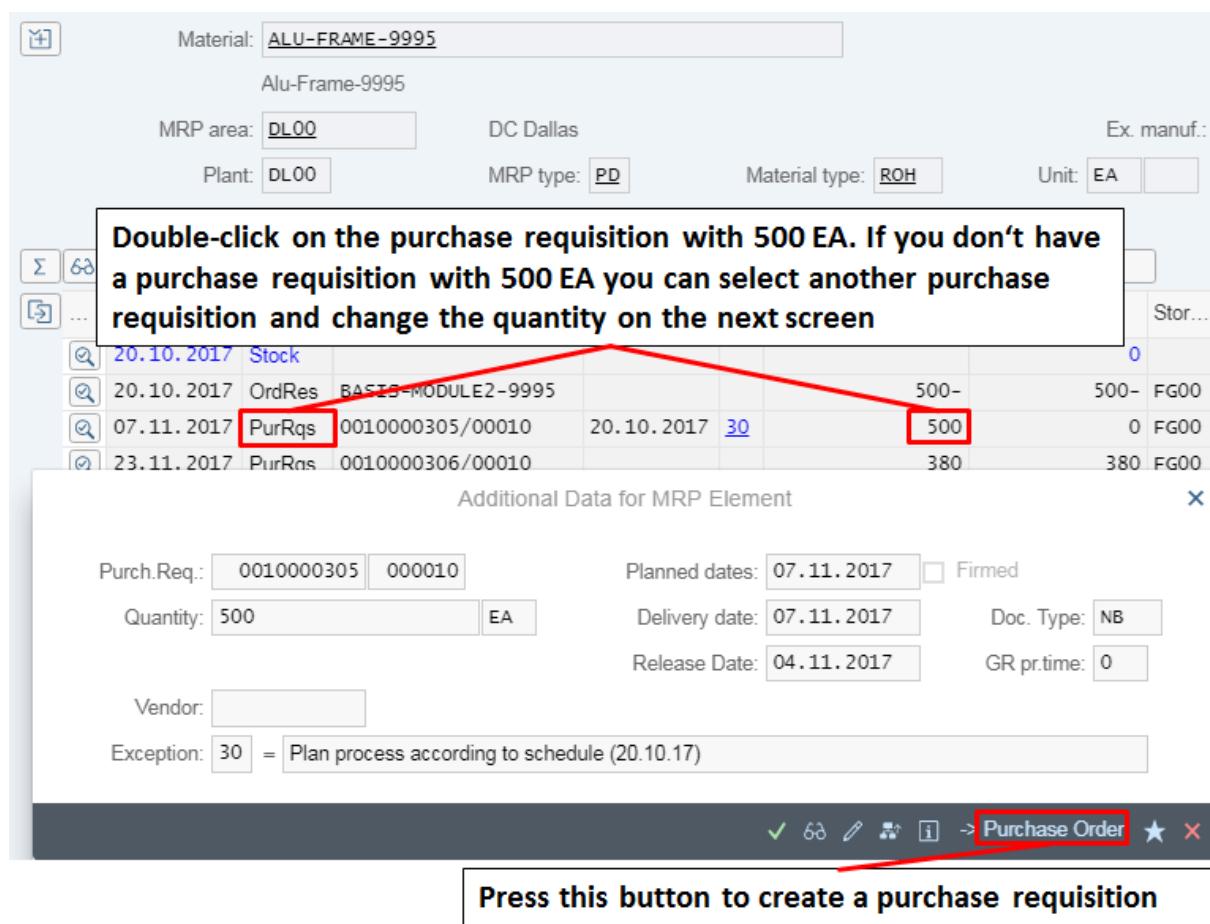


Figure 132: Create Purchase Order (1): SAP-System-Screenshot

8. You are forwarded into the **Create Purchase Order** view (a notification regarding purchasing organization can be ignored since you will enter it later). In the left frame (vendor, source of supply, category, etc.) you can see a purchase requisition to your vendor. For clarity reasons, you can enlarge the left window if necessary.
9. Select the number of the open purchase requisitions (on the left hand side below the document overview window) and click the button (**Adopt / Copy**) in the left window. As a result of this, the detailed data from the purchase requisition is copied to the new **purchase order**.
10. Now, enter **US00** as **Purchasing Organization** and **your Vendor account (see data sheet Purchase-to-Pay)** as Vendor. Confirm with **Enter**.

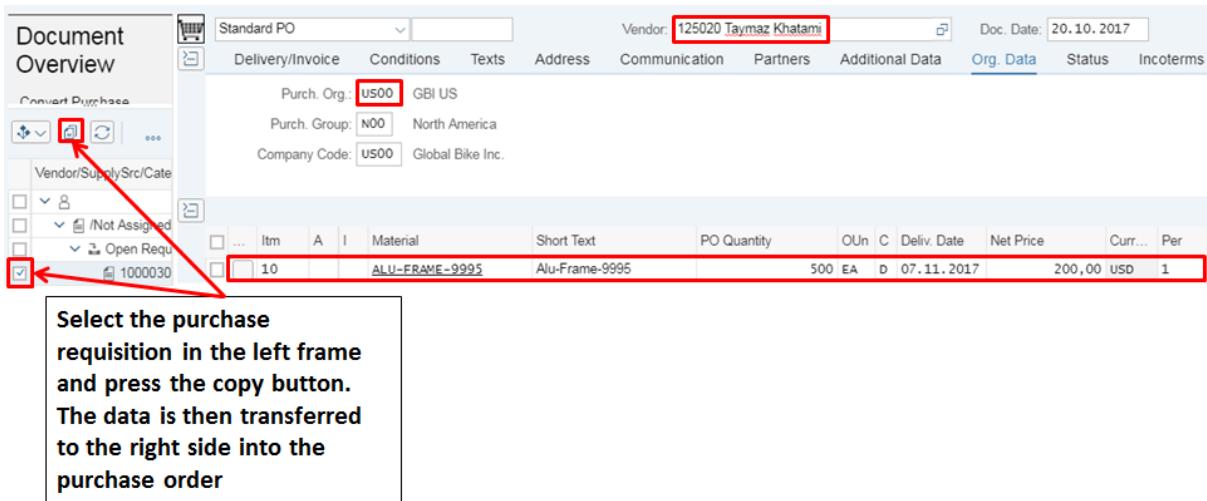


Figure 133: Create Purchase Order (2): SAP-System-Screenshot

11. Save the order and skip a possible message regarding occurred messages by saving. List the number on your data sheet.

Purchase Order for Aluminum Frame:

12. Update the list by clicking the Refresh symbol. The purchase requisition (Pur.Req.) is converted to a purchase order delivery schedule line (POItem). Close the current view.

Date	MRP element data	Rescheduli...	... Receipt/Reqmt	Available Qty	Stor...
20.10.2017	Stock			0	
20.10.2017	OrdRes BASIS-MODULE2-9995			500-	500 FG00
07.11.2017	POitem 4500000030/00010	20.10.2017 10	500	0	FG00
23.11.2017	PurRqs 0010000306/00010			380	380 FG00
23.11.2017	DepReq BASIS-MODULE2-9995			380-	0 FG00
24.12.2017	PurRqs 0010000307/00010			478	478 FG00
24.12.2017	DepReq BASIS-MODULE2-9995			478-	0 FG00

Figure 134: Create Purchase Order (3): SAP-System-Screenshot

3.4.3.2.3 Posting the Goods Receipt for a Purchase Order

To facilitate the case study, we assume that the vendor delivers the goods at the same day.



HINT

In case you forgot to list your order numbers, you can find them out by using the Monitor Stock / Requirements List and entering the material name. You find the number in the row of your Purchase Order (POitem) in the column MRP element data.

Scroll down to the tile group **Script 3- Lead-to-Cash** and open the app **Post Goods Movement**.

1. On the upper part of the screen, select **Goods Receipt** from the left drop-down menu and select **Purchase Order** from the right drop down menu.
2. Enter **your order number** for the purchase order Alu-Frame in the field on the right hand side of the drop-down menu. Press *Enter*.
3. The system proposes goods receipt quantities according to the purchase order. Enter * in the **Delivery Note** field.
4. **Select the Item Ok field on the bottom of the screen** to mark the goods receipt document as checked.
5. **Save**.
6. List the document number goods receipt and press **Exit**.

Material Document for Aluminum Frame:



Check carefully, whether a sufficient quantity of gearing-xyyy and wheel-xyyy for production is available in unrestricted-use stock for the manufacturing of 500 Speedstarletts (or Basis-Module2, respectively). Just consider that you need more than 500 gearings and 1000 wheels on stock for the production process! If this is not the case, you need to re-order the respective components on your own.

Date	MRP ...	MRP element data	R...	... Receipt/Reqmt	Available Qty	Stor...
20.10.2017	Stock				500	
20.10.2017	OrdRes	BASIS-MODULE2-9995		500-	0	FG00
23.11.2017	PurRqs	0010000306/00010		380	380	FG00
23.11.2017	DepReq	BASIS-MODULE2-9995		380-	0	FG00
24.12.2017	PurRqs	0010000307/00010		478	478	FG00
24.12.2017	DepReq	BASIS-MODULE2-9995		478-	0	FG00

Figure 135: Available Quantity of Alu-Frame: SAP-System-Screenshot

3.4.3.3 Production Process of the Speedstarlett

In this chapter you are going to perform the necessary actions for the production process of the Speedstarlett. This includes the following steps for the production order of the Basis-module2 and the Speedstarlett accordingly:

- goods issue of the components to the first production order (Basis-module2)
- confirmation of the first production order (Basis-module2)

- goods receipt for the first production order (Basis-module2)
- goods issue of the components to the second production order (Speedstarlett)
- confirmation of the second production order (Speedstarlett)
- goods receipt for the second production order (Speedstarlett)

3.4.3.3.1 Enter Goods Issue for the first Production Order (Basis-Module2)

Next, post the goods issue for the production order. This is to make materials required for the production of the Basis-module available to the production center. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Post Goods Movement**.

1. On the upper part of the screen, select **Goods Issue** from the left drop-down menu and select **Order** from the right drop down menu.
2. Enter your order number for the *first production order (Basis-Module2-xxxx)* in the field on the right hand side of the drop-down menu. Press *Enter*.
3. The system proposes the two correct material positions. Enter * in the **Material Slip** field. Furthermore, within the *second row*, select the **OK** field and in the lower area, select the **Item OK** field (therefore, scroll down).

The screenshot shows the SAP Post Goods Movement interface. At the top, there are fields for Document Date (20.10.2017), Posting Date (20.10.2017), and Material Slip (*). Below this is a table with two rows of material data:

Line	Mat. Short Text	...	OK	Qty in UnE	EUn	SLoc	Order
1	Alu-Frame-9995	<input type="checkbox"/>	<input type="checkbox"/>	500	EA	Finished Goods	1000043
2	Gearing-9995	<input type="checkbox"/>	<input checked="" type="checkbox"/>	500	EA	Finished Goods	1000043

At the bottom of the table, there are buttons for Save, Delete, Contents, and other navigation. Below the table is another section with fields for Material (Alu-Frame-9995), Material Group (RAW), and Equipment. The 'Item OK' checkbox is highlighted with a red box. The status bar at the bottom shows Line: 1.

Figure 136: Goods Issue for Basis-Module2 Production Order: SAP-System-Screenshot

4. **Save (Post)** and list the document number.

Material Document Number (Goods Issue) Basis-Module2:

3.4.3.3.2 Confirmation of the first Production Order (Basis-Module2)

Your next task is to **confirm** the production orders for the Basis-module 2. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Confirmation for Production Order**.

1. In the **Order** field, enter *the number* of the *first production order* for the **Basis-Module2**. Press **Enter**.
2. Select the confirmation type **Final Confirmation** and **save**.
3. The system issues a notification that the confirmation was saved.

3.4.3.3.3 Goods Receipt for the first Production Order (Basis-Module2)

Once completed the Production order, you need to post the good receipt for your production order in your storage location. The goods receipt transfers the finished products from the Work place to the storage location of the Plant. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Post Goods Movement**.

1. On the upper part of the screen, select **Goods Receipt** from the left drop-down menu and select **Order** from the right drop down menu.
2. Enter your order number for the *first production order (Basis-Module2-xxxx)* in the field on the right hand side of the drop-down menu. Press **Enter**.
3. The system proposes the correct material position. Within the **Delivery Note** field, enter *. Furthermore, select the **Item OK** field (therefore, scroll down) on the lower part of the screen to mark the goods receipt document as checked.

Line	Mat. Short Text	...	OK	Qty in UnE	EUn	SLoc
1	Basis-Module2-9995			500	EA	Finished Goods

Figure 137: Goods Receipt for the First Production Order: SAP-System-Screenshot

4. **Save (Post)** the goods receipt and note the material document number in your data sheet.

Material Document Number (Goods Receipt) Basis-Module2:

Finally, check that the production of the Basis-Module 2 is completed and the finished good is available on stock. Therefore, scroll down to the tile group **Script 3- Lead-to-Cash** and open the app **Monitor Stock / Requirements List**.

Date	MRP ...	MRP element data	Receipt/Reqmt	Available Qty	Pro...	Stor...
20.10.2017	Stock	SPEEDSTARLETT-9995		500-	500	0	FG00
20.10.2017	OrdRes	0000000856/STCK		380	380	0000	FG00
26.11.2017	PldOrd	SPEEDSTARLETT-9995		380-	0	0000	FG00
27.12.2017	PldOrd	0000000857/STCK		478	478	0000	FG00
27.12.2017	DepReq	SPEEDSTARLETT-9995		478-	0	0000	FG00

Figure 138: Produced Basis-Module2: SAP-System-Screenshot

3.4.3.3.4 Enter Goods Issue for the Second Production Order (Speedstarlett)

Now that the semi-finished product is available from storage location FG00, we can produce our finished product, i.e., the Speedstarlett. We start again with the goods issue of the materials to production. Again, the system will carry this step out automatically.

Within the tile group **Script 3 – Lead-to-Cash** select the app **Post Goods Movement**.

1. On the upper part of the screen, select **Goods Issue** from the left drop-down menu and select **Order** from the right drop down menu.
2. Enter your order number for the *second production order (Speedstarlett-xxxx)* in the field on the right hand side of the drop-down menu. Press *Enter*.
3. The system proposes the two correct material positions. The system proposes the two correct material positions. Enter * in the **Material Slip** field.
4. Furthermore, within the *second row*, select the **OK** field and in the lower area, select the **Item OK** field (therefore, scroll down).
5. **Save (Post)** and list the document number.

Material Document Number (Goods Issue) Speedstarlett:

3.4.3.3.5 Confirmation of the second Production Order (Speedstarlett)

Since all materials are available for production, we can carry out the production process. We assume again, that production is completed very fast so that the only thing left to do is the confirmation. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Confirmation for Production Order**.

1. In the **Order** field, enter *the number of the second production order (Speedstarlett)*. Press *Enter*.

2. Select the confirmation type **Final Confirmation**.
3. **Save**.
4. The system issues a notification that the confirmation was saved.

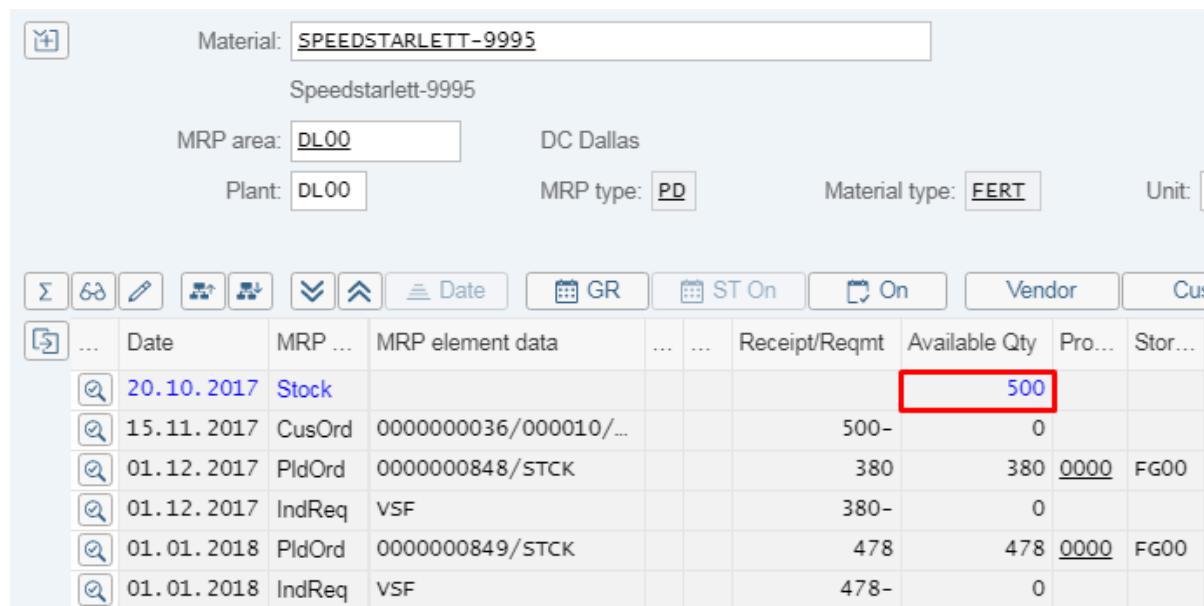
3.4.3.3.6 Goods Receipt for the second Production Order (Speedstarlett)

Once completed the Production order, you post the good receipt for your production order in your storage location. The goods receipt transfers the finished products from the Work place to the storage location of the Plant. Within the tile group **Script 3 – Lead-to-Cash** select the app **Post Goods Movement**.

1. On the upper part of the screen, select **Goods Receipt** from the left drop-down menu and select **Order** from the right drop down menu.
2. Enter your order number for the **second production order (Speedstarlett-xxxx)** in the field on the right hand side of the drop-down menu. Press **Enter**.
3. The system proposes the correct material position. Within the **Delivery Note** field, enter *. Furthermore, select the **Item OK** field (therefore, scroll down) on the lower part of the screen to mark the goods receipt document as checked.
4. **Save (Post)** the goods receipt and note the material document number in your data sheet.

Material Document Number (Goods Receipt) Speedstarlett:

Finally, check within the **Stock / Requirements List** app that the production of the Speedstarlett is completed and the finished good is available on stock.



The screenshot shows the SAP Stock / Requirements List interface. At the top, there are input fields for Material (SPEEDSTARLETT-9995), MRP area (DL00), Plant (DL00), and MRP type (PD). Below the header, there is a toolbar with various icons. The main area is a grid table with columns: Date, MRP ... (dropdown), MRP element data, ... (two dropdowns), Receipt/Reqmt, Available Qty, Pro..., and Stor... (dropdown). The table contains several rows of data, with the 'Available Qty' column highlighted in red for one row where it shows the value 500.

Date	MRP ...	MRP element data	Receipt/Reqmt	Available Qty	Pro...	Stor...
20.10.2017	Stock			500		
15.11.2017	CusOrd	0000000036/000010/...		500-	0	
01.12.2017	PldOrd	0000000848/STCK		380	380	0000 FG00
01.12.2017	IndReq	VSF		380-	0	
01.01.2018	PldOrd	0000000849/STCK		478	478	0000 FG00
01.01.2018	IndReq	VSF		478-	0	

Figure 139: Produced Speedstarlett: SAP-System-Screenshot

3.4.4 Stock Transfer

Now that you have produced the Speedstarletts, the next step is to deliver the finished product to the customer. Currently, the finished goods are stored in the storage location of the production plant in Dallas (DL00). However, the distribution center of the GBI company is in San Diego (SD00). Consequently, you need to transfer the materials from the plant in Dallas to the Plant in San Diego, before they can be shipped to the customer. Therefore, **plant SD00** (San Diego) uses a **Stock Transport Order** to request the goods:

- Plant **DL00** (Dallas) is in charge of **goods issue** from its stock.
- Plant **SD00** (San Diego) is in charge of the **goods receipt** and the further processing of the material (internal transportation) in its warehouse by using the warehouse management system.

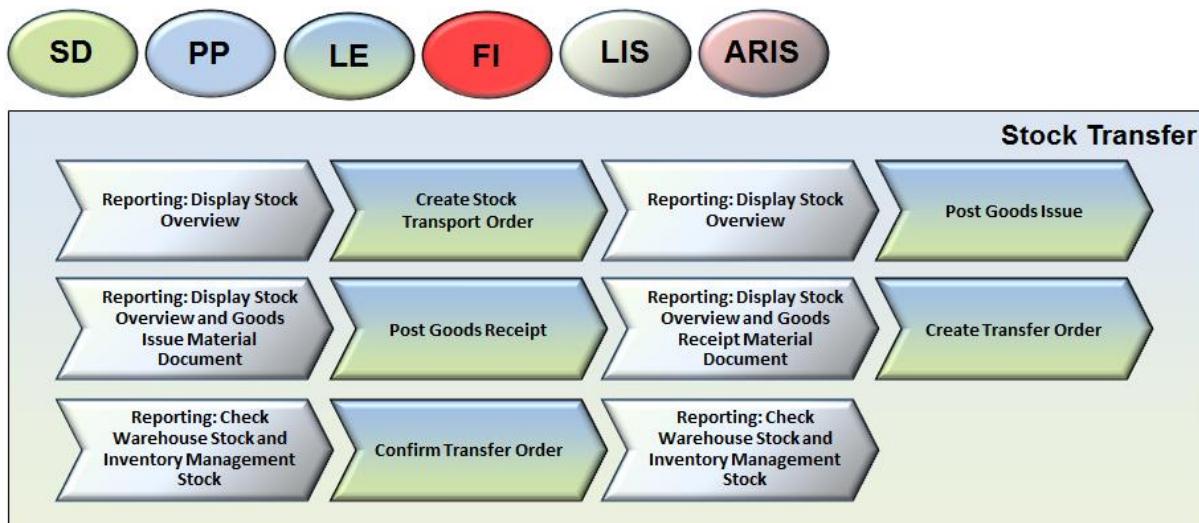


Figure 140: Process Overview: Stock Transfer

When Warehouse Management (LE-WM) is active in SAP S/4HANA, all internal and external goods movements must be managed by a responsible warehouse number.

3.4.4.1 Reporting: Display Stock Overview

Display the stock overview in **Inventory Management** to view the current stock situation. To display the stock overview, call up within the tile group **Script 3 – Lead-to-Cash** the app **Stock Overview**.

1. Enter

<ul style="list-style-type: none"> - Material - No Zero Stock Lines - Company Code - Plant - Storage Location - Batch - Special Stock 	<ul style="list-style-type: none"> <i>Speedstarlett-xyyy</i> <i>deselect</i> <i>select</i> <i>select</i> <i>select</i> <i>select</i> <i>select</i>
---	---
- Delete any entries in the **Plant** and **Storage Location** field and press **Execute**.

The screenshot shows the SAP System interface for Inventory Management. It includes four main sections:

- Database Selections:** Material: speedstarlett-9995, Plant: [] to: [] Storage Location: [] to: [] Batch: [] to: []
- Stock Type Selection:** Also Select Special Stocks Also Select Stock Commitments
- List Display:** Special Stock Indicator: [] to: [] *Display version: 1 Display Unit of Measure: [] No Zero Stock Lines Decimal Place as per Unit Aggregated Stock
- Selection of Display Levels:** Company Code Plant Storage Location Batch Special Stock

Figure 141: Current Storage Situation in Inventory Management (1): SAP-System-Screenshot

2. You can see that plant DL00 (Dallas) has an unrestricted-use stock of 500 units (alternatively, the number you produced in the previous teaching unit), while no Speedstarlettes are stored in San Diego.

The screenshot shows the SAP System interface for Inventory Management, specifically the Stock Overview section for Speedstarlett-9995. It includes the following details:

Client/Company Code/Plant/Storage Location/Batch/Special Stock	Unrestricted use
Full	500,000
US00 Global Bike Inc.	500,000
DL00 Plant Dallas	500,000
Receiving Valuated Stock in Tr	
FG00 Finished Goods	500,000
SD00 DC San Diego	
Receiving Valuated Stock in Tr	
FG00 Finished Goods	

Annotations:

- A red box highlights the row for "DL00 Plant Dallas". A callout box states: "You see that the in the US subsidiary of the GBI company 500 units of Speedstarlettes are stored in storage location FG00 of plant DL00. The stock category is Unrestricted use."
- A red box highlights the row for "SD00 DC San Diego". A callout box states: "The stock in plant SD00 – which is the Distribution Center of GBI US – is currently zero."

Figure 142: Current Storage Situation in Inventory Management (2): SAP-System-Screenshot



Dependent on the current system settings it may happen that between plant and storage location there are displayed further rows. Since these rows are not relevant for further processing, you can ignore them.

NOTE

- Leave the transaction.

3.4.4.2 Create Stock Transport Order

You will transfer the 500 units of the Speedstarletts that the customer ordered from the unrestricted-use stock in Dallas to San Diego. Therefore, you create a **Stock Transport Order** in plant SD00 (San Diego). As you have learned from the theory, one benefit of using Stock Transport Orders is that "You can plan goods receipt at the receiving plant". Without the Stock Transport Order, a goods issue must have been created in Dallas and the colleagues in San Diego would have no chance to initiate this process.

To create a Stock Transport Order in San Diego choose within the tile group **Script 3 – Lead-to-Cash** the app **Create Purchase Order**.

- Select order type **Stock Transp. Order** from the left upper drop-down field.



For further processing, it is very important that you select the order type **Stock Transp. Order**. Therefore, pay attention to choose the correct order type.

CAUTION

- Enter the subsequent header data:

- Supplying Plant	DL00
- Purch. Org.	US00
- Purch. Group	N00
- Company Code	US00
- Expand the position overview and enter the following position data:

- Material	Speedstarlett-xyyy
- PO Quantity	500
- Plant (Plnt)	SD00 (San Diego)
- Storage Location (SLoc)	FG00 (Finished Goods)
- Press *Enter* and confirm any system notifications again with *Enter*

Material	Short Text	PO Quantity	Plant	Stor. Location
SPEEDSTARLETT-9995	Speedstarlett-9995	500 EA	DC San Diego	Finished Goods

Figure 143: Create Stock Transfer: SAP-System-Screenshot

4. Press **Save**. Skip possible notifications by saving again.
5. List the number of the Stock Transport Order on your data sheet and leave the transaction by pressing **Exit**.

Stock Transport Order:

3.4.4.3 Reporting: Display Stock Overview

Again, display the stock overview in **Inventory Management** to view the stock situation after posting the Stock Transport Order. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Stock overview**.

1. Enter

- Material	<i>Speedstarlett-xxxx</i>
- No Zero Stock Lines	<i>deselect</i>
- Company Code	<i>select</i>
- Plant	<i>select</i>
- Storage Location	<i>select</i>
- Batch	<i>select</i>
- Special Stock	<i>select</i>
- Delete any entries in the Plant and Storage location field and press Execute .	
2. You can see that plant DL00 (Dallas) has still an unrestricted-use stock of 500 units (alternatively, the number you produced in the previous teaching unit), while 500 units of Speedstarlett are displayed in stock category On-order Stock for San Diego.

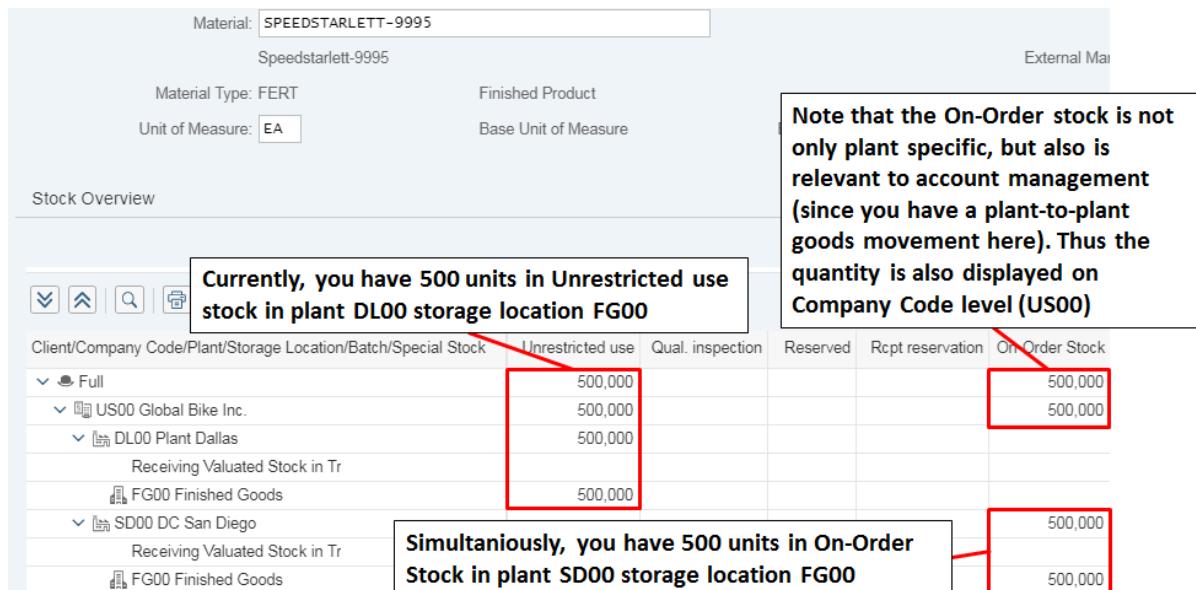


Figure 144: Storage Situation after Stock Transport Order: SAP-System-Screenshot

3. Leave the transaction by pressing **Exit**

3.4.4.4 Post Goods Issue

Now, post a **goods issue** of 500 units of the material **Speedstarlett-xxxx** from plant **DL00**, storage location **FG00** to transfer the material from Dallas to San Diego. You use your Stock

Transfer Order created in San Diego as reference. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Post Goods Movement**.

1. On the upper part of the screen, select **Goods Issue** from the left drop-down menu and select **Purchase Order** from the right drop down menu.
2. Enter the number of your **Stock Transport Order**. The **movement type** should be **351**.
3. Press **Enter**.
4. Select the **Where** tab from the item detail and enter **Storage location FG00 (Finished Goods)**.
5. Check the **Item OK** flag.

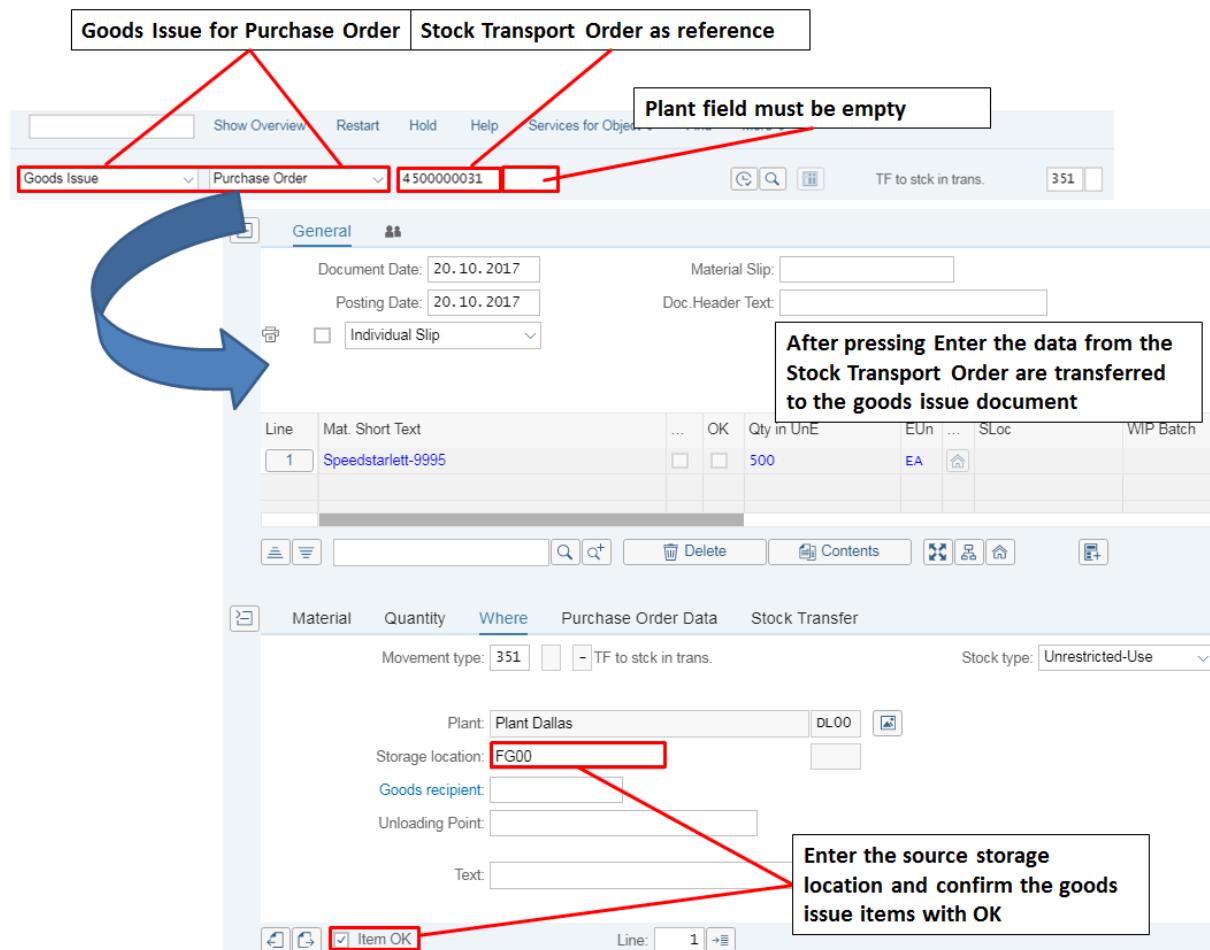


Figure 145: Post Goods Issue: SAP-System-Screenshot

6. **Save (Post)** and list the document number.
7. A material document is created. Remember from the theory: when posting a goods issue, a material document is always created. List the material document number and leave the transaction by pressing **Exit**.

Goods Issue Transport Order:

3.4.4.5 Reporting: Display Stock Overview and Goods Issue Material Document

Once again, display the stock overview in **Inventory Management** to view the stock situation after posting the Stock Transport Order. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Stock Overview**.

1. Enter
 - **Material** *Speedstarlett-xyyy*
 - **No Zero Stock Lines** *deselect*
 - **Company Code** *select*
 - **Plant** *select*
 - **Storage Location** *select*
 - **Batch** *select*
 - **Special Stock** *select*
 - Delete any entries in the **Plant** and **Storage location** field and press **Execute**.
2. You can see that plant DL00 (Dallas) has now an unrestricted-use stock of 0 units (alternatively, the number you produced in the previous teaching unit -500), since the goods issue posting is the final step of the material leaving plant DL00.
500 units of Speedstarletts are still displayed in stock category *On-order Stock* for San Diego, since you have not yet posted any goods receipt in San Diego.

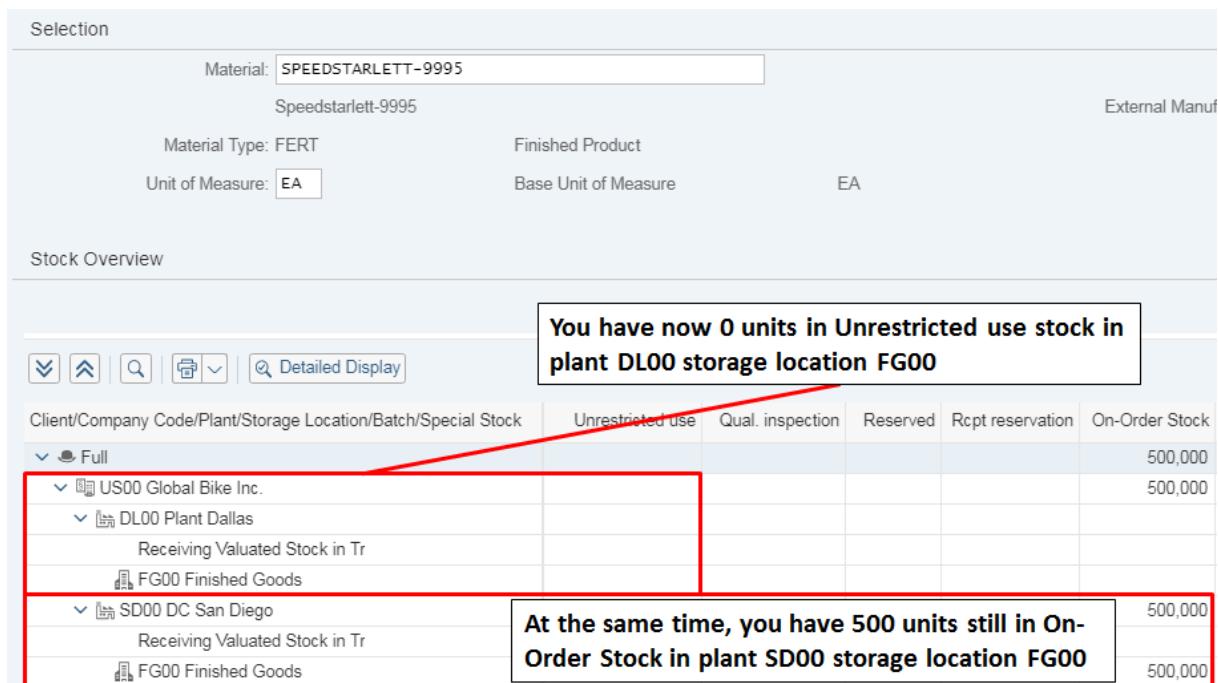


Figure 146: Storage Situation after Goods Issue Posting: SAP-System-Screenshot

3. Leave the transaction and display the material document that was generated with the **goods issue**. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Post Goods Movement**.
4. From the dropdown menus, select operation **Display** and reference **Material Document**. Enter the **number** of your **Material Document (Goods Issue Transport Order)** and press **Execute**.
5. Open the **Doc.info** tab and press . Then within the popup double-click on **Accounting Document**.

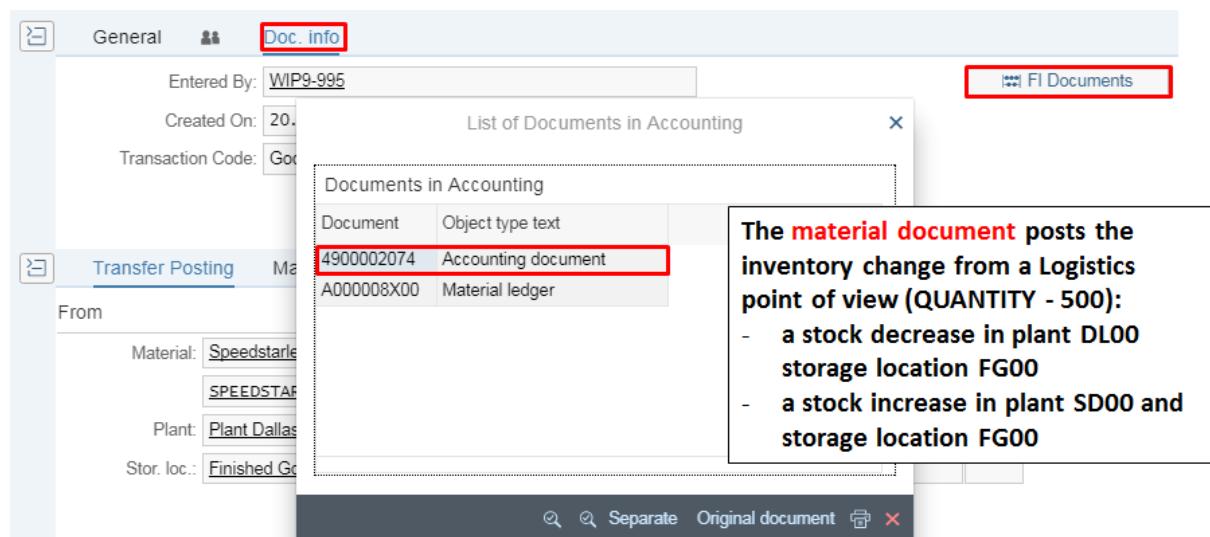


Figure 147: Effects of Goods Movement on Stock and Accounting (1): SAP-System-Screenshot

6. You can see the corresponding value-based posting in Account Management.

The screenshot shows the 'Data Entry View' for an accounting document. It includes fields for Document Number (4900002074), Document Date (20.10.2017), Reference, and Currency (USD). A callout box to the right contains the following text:

The corresponding accounting document posts the inventory change from a Financial point of view (VALUE - 500*1140 = 570.000):

- A value decrease on account 200100 (Inventory Finished Goods)
- A value increase on account 200100 (Inventory Finished Goods)

Even if no changes in valuation occurs (here: both plants belong to the same Company Code and the same account is booked) an accounting document is created anyway in a plant-to-plant goods movement

Below this, a table shows accounting entries. A red box highlights the second row. A red arrow points from the text in the callout box to the highlighted row in the table.

Co...	Item Key	... Account	Description	Amount Curr.	Tx
US00	1 99	200100	Inv-FG	570.000,00-	USD
	2 89	200100	Inv-FG	570.000,00	USD

Figure 148: Effects of Goods Movement on Stock and Accounting: SAP-System-Screenshot

7. Go one step back () and close the popup *Lists of Documents in Accounting*.
8. On the **Transfer Posting** tab, select *stock overview* () for the destination (**Dest**) position.
9. Position the cursor on the **storage location FG00 Finished Goods** row and select the **Detailed Display** or scroll to the right. The storage location-specific transfer stock type is referred to as On-Order Stock. Note the On-Order Stock quantity displayed.

On-Order Stock quantity:

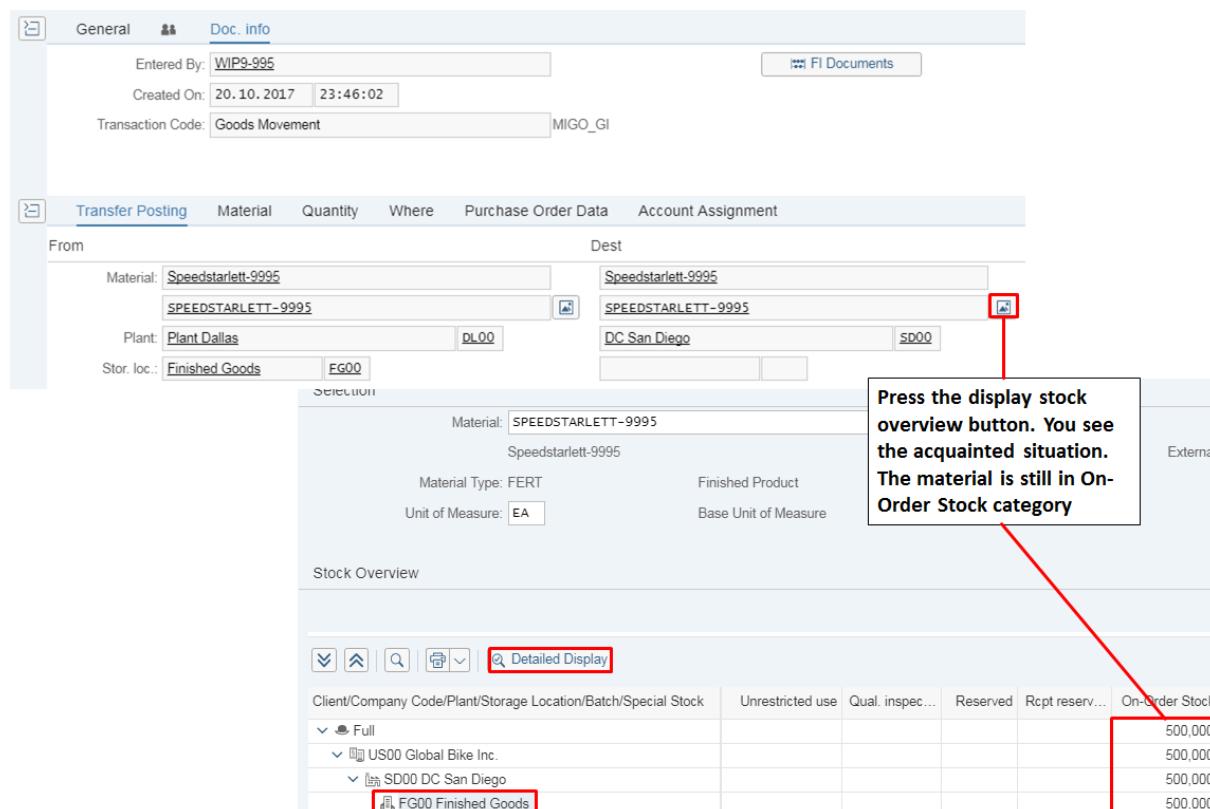


Figure 149: Stock Overview: SAP-System-Screenshot

3.4.4.6 Post Goods Receipt

Now we assume that transportation of the Speedstarletts was carried out very quickly. The goods arrived at plant SD00. Post the goods receipt for the Stock Transfer Order for the material Speedstarlett. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Post Goods Movement**.

1. Select the operation **Goods Receipt** and the **Purchase Order** reference from the drop-down fields. Enter the **Stock Transport Order** number. Make sure that the **plant field** is empty and choose *Execute*.



Figure 150: Post Goods Receipt (1): SAP-System-Screenshot

2. Check the following data on the **Material**, **Quantity** and **Where** tabs
 - Material **Speedstarlett-xyyy**
 - Quantity **500**
 - Plant **SD00**
 - Storage location **FG00**

3. In the **Delivery Note** field, enter *. Check whether the **Item OK** flag is set.

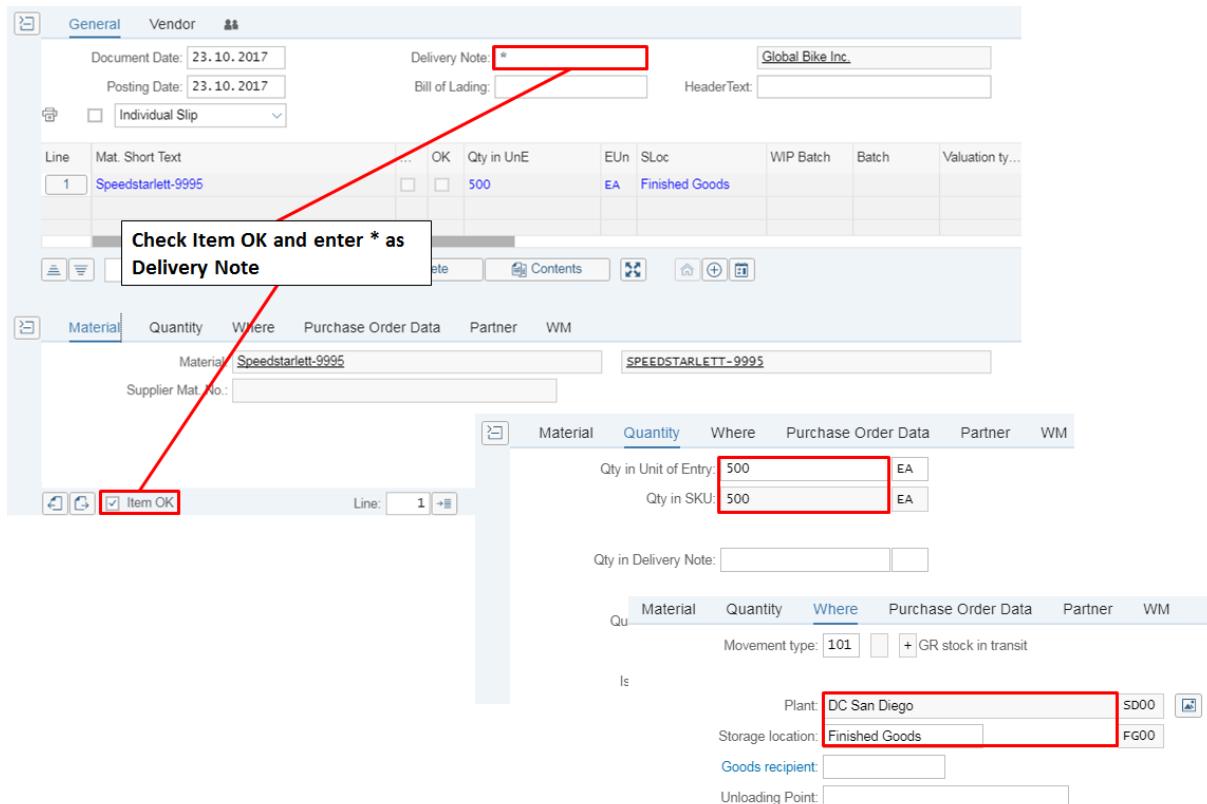


Figure 151: Post Goods Receipt (2): SAP-System-Screenshot

4. Select **Save (Post)**.
5. You see that another material document is created. List the **material document number** and leave the transaction by pressing **Exit**.

Goods Receipt Transport Order:

3.4.4.7 Reporting: Display Stock Overview and Goods Receipt Material Document

Once again, display the stock overview in **Inventory Management** to view the stock situation after posting the Stock Transport Order. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Stock Overview**.

1. Enter

- Material	<i>Speedstarlett-xxxx</i>
- No Zero Stock Lines	<i>deselect</i>
- Company Code	<i>select</i>
- Plant	<i>select</i>
- Storage Location	<i>select</i>
- Batch	<i>select</i>
- Special Stock	<i>select</i>
- Delete any entries in the **Plant** and **Storage location** field and press **Execute**.

2. You can see that plant DL00 (Dallas) has now an unrestricted-use stock of 0 units (alternatively, the number you produced in the previous teaching unit -500), since the goods issue posting is the final step of the material leaving plant DL00.
- 500 units of Speedstarletts are now displayed in stock category *Unrestricted-use* for San Diego, since you have posted the goods receipt in San Diego.

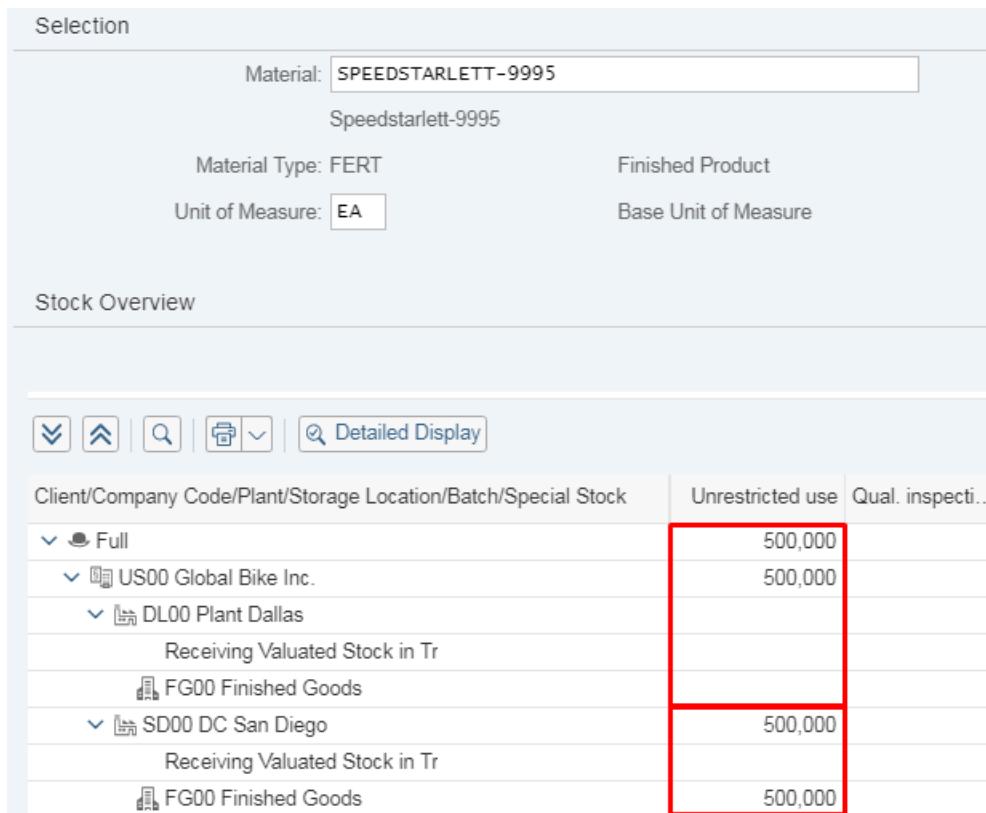


Figure 152: Storage Situation after Goods Receipt Posting: SAP-System-Screenshot

- Now again, leave the current view and display material document which was generated with posting **goods receipt**. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Post Goods Movement**.
- Select **Display** and **Material Document** from the respective dropdown menus and enter your *material document number (Goods Receipt Transport Order)*. Select **Execute**.
- Open the **Doc.info** tab and press **FI Documents**. You will receive the message that no subsequent documents have been found in Accounting. Do **not leave** the view.

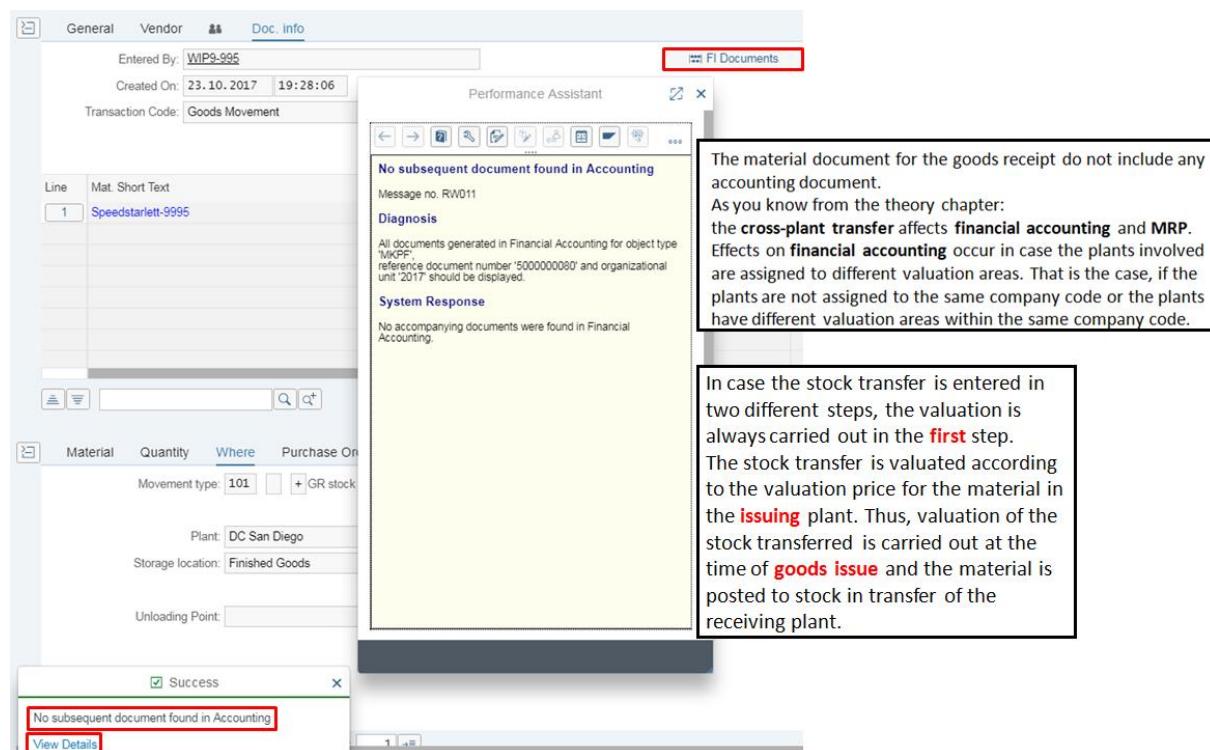


Figure 153: Effects of Goods Receipt on Accounting: SAP-System-Screenshot

The Speedstarletts were now received in plant SD00. Check the item's storage location FG00 in plant SD00 and determine the storage area (storage type) it is currently located in.

1. Close the system notification regarding subsequent documents and open the **WM** tab.
2. On the **WM** tab, look for the **storage type** and the **transfer requirement number** and note them on your data sheet. Leave the view by pressing **Exit**.

Storage Type 1:

TR Number:

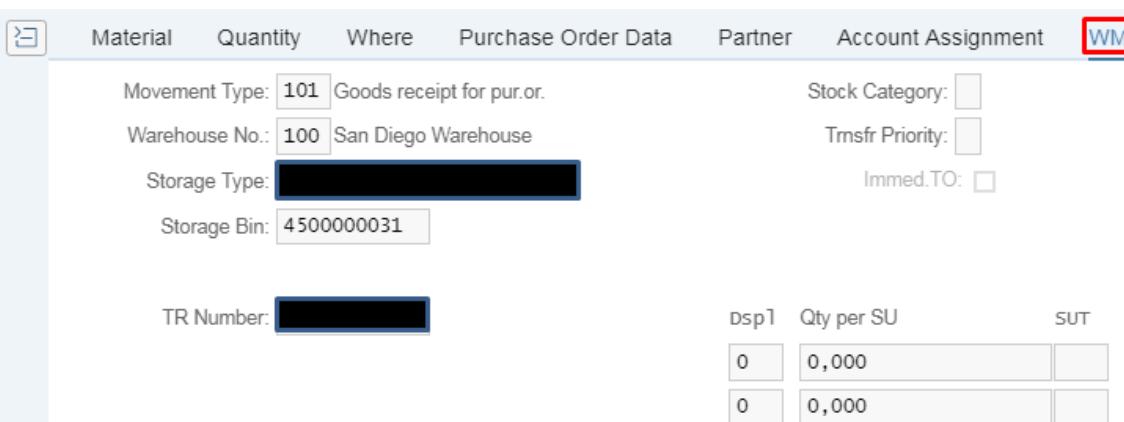


Figure 154: Storage Type and Transfer Requirements Number: SAP-System-Screenshot



NOTE

Depending on the current system settings it is possible that an Account Assignment tab between Partner and WM tab is available. Since this tab is not relevant for further processing, you can ignore it.

3.4.4.8 Create Transfer Order

Since the plant SD00 is managed by the SAP S/4HANA system's Warehouse Management, all goods movements in this plant are relevant for SAP LE-WM and handled by the corresponding warehouse number. Thus, the goods receipt in plant SD00 has created a transfer requirement. Display the transfer requirement and create a transfer order with reference to it in order to move the material within the warehouse from one stock type to another. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Display Transfer Requirement**.

1. Enter the following data:
 - Warehouse number **100**
 - Material **Speedstarlett-xxxx**
 - Plant **must be empty**
 - Confirm your entries with **Enter**.
2. Select the **TR number** line and press **TO in Foreground** (or **More → TO in Foreground**) in the function bar.

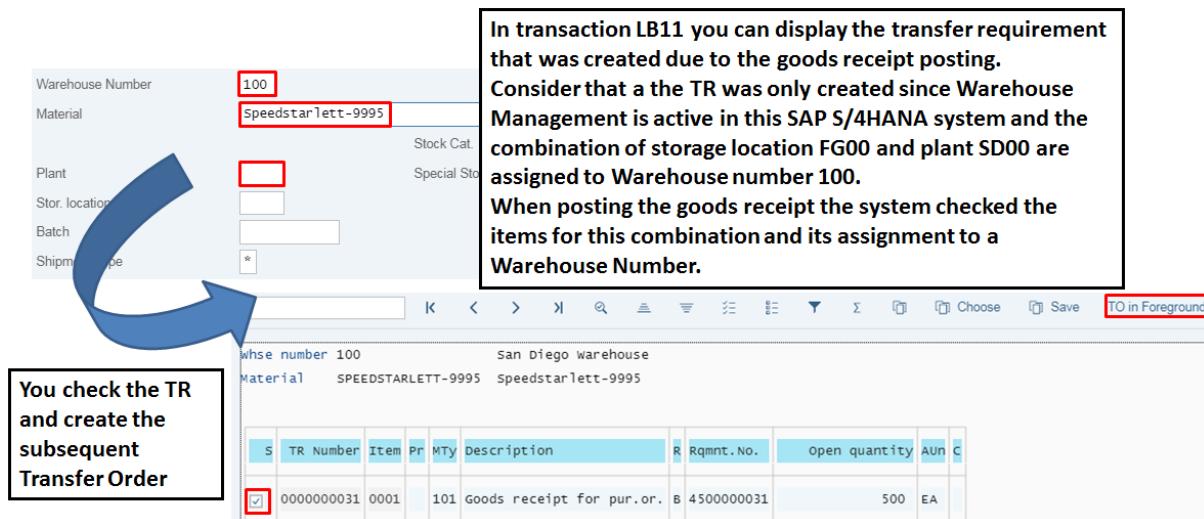


Figure 155: Create Transfer Order (1): SAP-System-Screenshot

3. On the next screen select **More → Edit → Put Away → Background** from the menu.

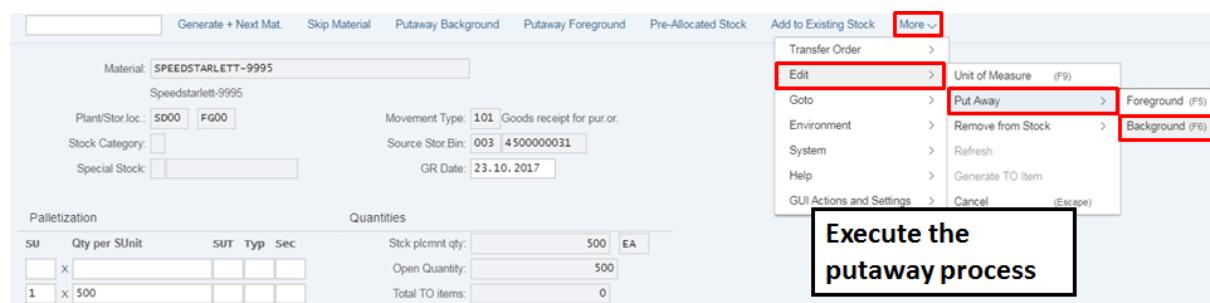


Figure 156: Create Transfer Order (2): SAP-System-Screenshot

4. With the Transfer Order, the material is moved into a new **storage type** in the warehouse and it is assigned to a new **storage bin**. List the storage type (Type) and the destination location (Destination Bin).

Storage Type 2:

Destination Location:

Material:	SPEEDSTARLETT-9995				
Speedstarlett-9995					
Plant/Stor.loc.:	SD00	FG00			
Movement Type:	101	Goods receipt for pur.or.			
Stock Category:					
Source Stor.Bin:	003	4500000031			
Special Stock:					
GR Date:	23.10.2017				
Palletization			Quantities		
SU	Qty per SUnit	SUT	Typ	Sec	
<input type="checkbox"/>	x				
<input type="checkbox"/>	x 500				
Stck plcmnt qty:	500		EA		
Open Quantity:	0				
Total TO items:	500				
Items					
<input type="checkbox"/> Itm	Dest.target quantity	SUT	Type	Sec	Destination Bin
<input checked="" type="checkbox"/> 1	500				
Dest.storage unit	T	Batch			

Figure 157: Destination Storage Type and Destination Bin: SAP-System-Screenshot

5. Press **Save (Post)**. List the transfer order.

Transfer Order Inbound Delivery:

6. Leave the transaction by pressing **Exit**.

3.4.4.9 Reporting: Check Warehouse Stock and Inventory Management Stock

In Warehouse Management now list the Quant, which is assigned to your Speedstarlett. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Bin Status Report**.

1. Enter the following data:
 - Warehouse number **100**
 - Storage bin **your Destination Location**
 - press **Execute**
2. Double-click the row containing your Speedstarlett-xxxx.
3. Write down the **number within the Quant field** on your data sheet.
4. In addition, position your cursor in the **Quant** field and open **F1 help**. What is the purpose of the Quant field? Write down the answer in your data sheet. Finally, press **Exit** twice

Quant:

Definition of Quant:

3.4.4.10 Confirm Transfer Order

Confirm the transfer order to actually move the quantity of 500 Speedstarletts to the receiving storage location. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Confirm Transfer Order**.

1. Enter the following data
 - **TO Number** *your Transfer Order Number (Inbound Delivery)*
 - **Warehouse number** *100*
 - Press **Enter**.
2. Make sure that **your material** is contained in the transfer order.

Active worklist	Inactive items	Confirmed intern.	Confirmed						
Item	Material	Plnt	Batch	D...	Dest. Bin	Actual qty	AUn	DI	Dest.diff.qty
1	SPEEDSTARLETT-9995	SD00		001	STBN-1-000	500	EA		

Figure 158: Confirm Transfer Order: SAP-System-Screenshot

3. **Save (Post)** the transfer order confirmation. Leave the transaction by pressing **Exit**.

3.4.4.11 Reporting: Check Warehouse Stock and Inventory Management Stock

Check the warehouse stock in warehouse **100** for the material **Speedstarlett-xyyy** again. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Bin Status Report**.

1. Enter the following data:
 - Warehouse number *100*
 - Storage bin *your Destination Location*
 - press **Execute**
2. Double-click on the row containing your Speedstarlett-xyyy.
3. 500 racing bicycles should now be in *Available stock* of the warehouse in San Diego with the storage type 001. Finally, press **Exit** twice

Material:	SPEEDSTARLETT-9995	
Speedstarlett-9995		
Plant/Stor.loc.:	SD00	FG00
Batch:		
Stock cat.:		
Special stk.:		
Picking Area:		
Stock data		
Total stock:	500	EA
Avail.stock:	500	
Stock for put.:	0	
Pick quantity:	0	
Weight:	22.046,244	LB
Cap.consumpt.:	0,000	
GR Date:	23.10.2017	
GR Number:	5000000080	1
Last movement:	23.10.2017	19:49:18
Document number:	2031	1
Certificate No.:		

Figure 159: Warehouse Stock: SAP-System-Screenshot

3.4.5 Shipping Processing

Now that you have supplied the distribution center in San Diego with the product ordered by the customer, you are ready to process the outbound delivery and send the product to the customer. The first step is to adjust the sales order and create a delivery document to initiate the shipping process.

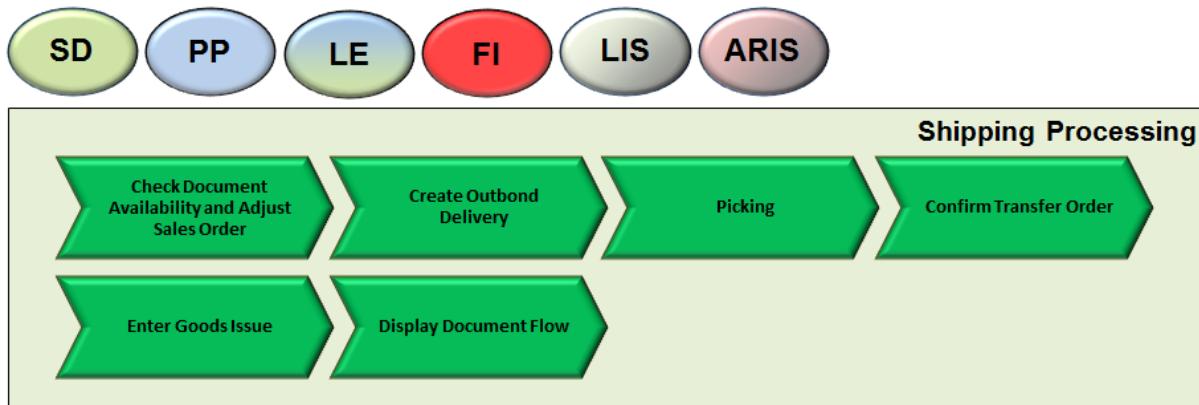


Figure 160: Process Overview: Shipping Processing

3.4.5.1 Check Document Availability and Adjust Sales Order

First check the availability of the product for your sales order document and adjust the sales order accordingly. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Manage Sales Orders**.

1. In the upper area, enter your **Sales Order** number in the **Sales Order** field and press **Go**.
2. Then, within the result list, click on the row containing your sales order () and switch to the editing mode by pressing the respective button ().
3. On the *Change Standard Order XXX: Overview* screen you can see in the Item details that the sales order item is assigned to plant DL00. Select **More → Edit → Check Document Availability** from the menu to check the product availability for shipping.

The screenshot shows the SAP "Change Standard Order XXX: Overview" screen. The "Sales" tab is selected. In the header, the "Standard Order" field contains "36". The "Net Value" field shows "1.100.000,00". The "Sold-To Party" field is "25015 Taymaz Khatami / Denver 80220". The "Ship-To Party" field is "25015 Taymaz Khatami / Denver 80220". The "Cust. Reference" field is "9905-Order". The "Cust. Ref. Date" field is empty. A context menu is open on the right, with the "Check Document Availability" option highlighted with a red box. The menu also includes "List Orders", "Document", "Edit", "Goto", "Extras", "Environment", "System", "Help", "GUI Actions and Settings", "Batch Determn", "Overall Network Scheduling", "Assign Contract", "Check Dangerous Goods", "New Pricing Document", "Incompletion Log", and "Cancel". At the bottom, there is a table with columns: Item, Material, Order Quantity, Un, S, Description, Customer Material Numb, ItCa, ..., First date, Pint, CnTy, Amount, Crcy, Net Price, per, UoM. One row is selected, showing "10 SPEEDSTARLETT-9995" and "DL00" in the Pint column.

Figure 161: Available-to-Promise Check (1): SAP-System-Screenshot

4. The system performs an Availability-to-Promise check and determines that there are no Speedstarlets on stock in plant DL00 (Dallas) that can be shipped to the customer. Press the **Other plants** button, select plant **SD00 (DC San Diego)** then press **Check plant**.

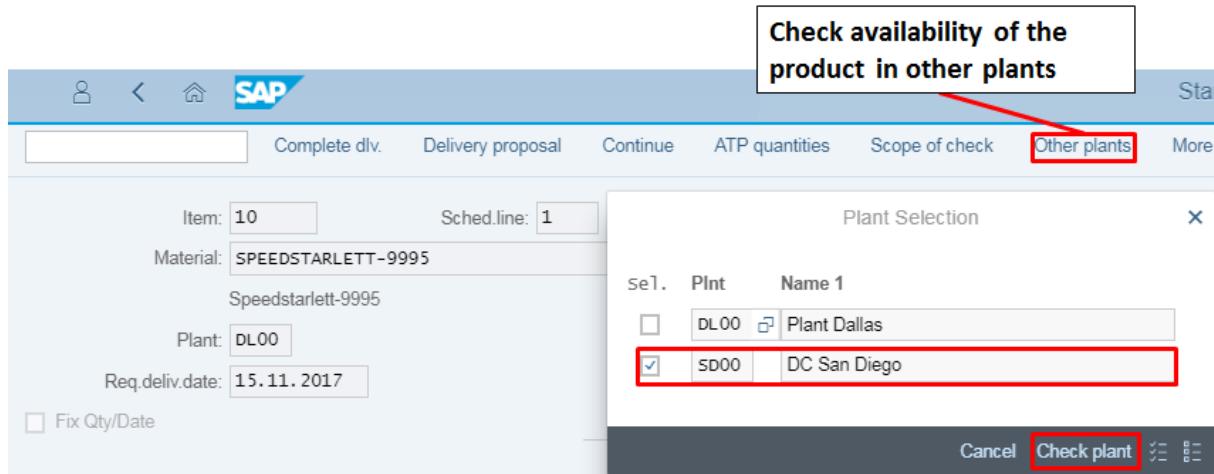


Figure 162: Available-to-Promise Check (2): SAP-System-Screenshot

5. The new availability check for plant SD00 reveals that the product is available there. Select the proposed row and press **Plant**.

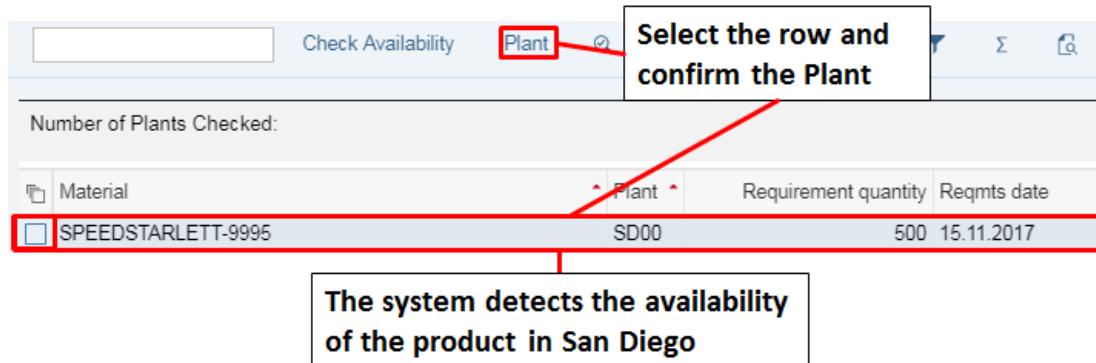


Figure 163: Available-to-Promise Check (3): SAP-System-Screenshot

6. The system takes you now back to the initial screen of your sales order. Note that the plant has now been changed to **SD00** (San Diego). Mark the item row with the Speedstarlett and select **More → Goto → Item → Schedule lines** from the menu.



NOTE

Dependent on the system settings changing the plant is not performed automatically. In this case you can overwrite plant DL00 manually with plant SD00 and confirm with Enter.

Item	Material	Order Quantity	UoM	Description	Customer Material Numbr	ItCa	... First date	PInt	CnTy	Amount	Crcy	Net Price
<input type="checkbox"/>	10 SPEEDSTARLETT-9995	500	EA	Speedstarlett-9995	TAN	D 15.11.2017	SD00	PR00		2.200,00	USD	

Figure 164: Available-to-Promise Check (4): SAP-System-Screenshot

7. Since you want to deliver the products as soon as possible to your customer and the material is available on stock, change the **Delivery Date** of the schedule line to **today's date**.

Delivery Date	Order quantity	Rounded qty	Confirmed Qty	S...	Delivery Block	Delivered qty
D 23.10.2017	500	500	500	EA		0

Figure 165: Available-to-Promise Check (5): SAP-System-Screenshot

8. **Save** the order and leave the transaction by pressing **Exit**.

3.4.5.2 Create Outbound Delivery

Now it is time to create the outbound delivery document for shipping out the products to the customer. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Create Outbound Delivery**.

- Enter the following data:

- **Shipping point** *SD00*
 - **Selection date** *current date*
 - **Order** *your sales order number*
 - Press *Enter*.
2. The system now opens a delivery document. Select the **Picking** tab. Enter storage location **FG00**.

All Items	Itm	Material	Plnt	SLoc	Deliv. Qty	Un	Picked Qty
<input type="checkbox"/>	10	SPEEDSTARLETT-9995	SD00	FG00	<input type="button" value="🔍"/>	EA	

Figure 166: Create Delivery Document: SAP-System-Screenshot

3. *Save* the document and list the delivery document number on your data sheet. Press *Exit*.
Delivery Document:

Next, open the newly created delivery in the change mode and answer the following questions. List the answers on your data sheet. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Change Outbound Delivery**.

Enter the number of your delivery document, choose *Enter* and open the **Picking** tab.

1. Which **Delivery Quantity** has the position in your delivery document?
2. Which **Picked Quantity** has the first item? Can you modify this entry?

Take a look at the **Document Flow** by clicking the symbol.

3. What is the **Status** of the standard order?
4. What is the **Status** of the delivery?

Close the view and press *Exit*.

3.4.5.3 Picking

The next step of the shipping process is **picking**. Create the transfer order as follow-up of your outbound delivery. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Create Transfer Order**.

1. Enter
 - **Warehouse Number** *100*
 - **Delivery** *your delivery number*
 - **Foreground/Background** *Foreground*
 - **Adopt Pick Quantity** *1*

- Press *Enter*.
- 2. The system generates the transfer order.

The screenshot shows the SAP Create Transfer Order interface. At the top, there are fields for Warehouse Number (100), Delivery Priority (0), Delivery (80000007), Picking Date (23.10.2017), Shipping Point (SD00), and Loading Date (23.10.2017). Below these are tabs for Active Worklist, Inactive items, and Processed items. The Active Worklist tab is selected, showing a table of items. The table has columns for Delivery, Item, Material, Description, SLoc, Plant, Batch, Picking quantity, and S... . One row is visible: Delivery 80000007, Item 10, Material SPEEDSTARLETT-9995, Description Speedstarlett-9995, SLoc FG00, Plant SD00, Batch, Picking quantity 500 EA.

Figure 167: Create Transfer Order: SAP-System-Screenshot

3. Press *Save (Post)* and list the **number of the transfer order** on your data sheet. Press *Exit*.

Transfer Order Outbound Delivery:

3.4.5.4 Change of Status Outbound Delivery (1)

Now, look at the impacts of picking on your delivery. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Change Outbound Delivery**.

1. Enter the number of your delivery document, choose *Enter* and open the **Status Overview** tab.
2. As you can see, there is a **C** (completely processed) in the **Pick.stat** (Picking status) field whereas in the **WM activity status** (Warehouse Management Status) field there is still a **B** (Partially processed).

The screenshot shows the SAP Change Outbound Delivery interface. At the top, there are fields for Outbound Deliv. (80000007), Document Date (23.10.2017), and Ship-to party (25015). Below these are tabs for Item Overview, Picking, Loading, Transport, Status Overview, and Goods Movement Data. The Status Overview tab is selected, showing the Overall Status - Delivery table. This table has columns for Delivery, OPS, PS, WM, C, Good..., BS, Sta, TS, OvCS, POD..., In Plant, DTU... . A row is visible: Delivery 80000007, OPS C, PS B, WM C, Good... A, BS A, Sta, TS, OvCS, POD..., In Plant, DTU... . Below this is the Delivery Item Status (All Items) table, which has columns for Item, Material, Pick..., PS, WMStat, Conf... , GS, BS, IBS, POD..., DTU... . A row is visible: Item 10, Material SPEEDS1, Pick... C, PS B, WMStat B, Conf... A, GS A, BS A, IBS, POD..., DTU... . The 'Pick...' and 'WMStat' columns are highlighted with red boxes.

Figure 168: Change of Status Outbound Delivery (1): SAP-System-Screenshot

3. Close the view without saving.

3.4.5.5 Confirm Transfer Order

Confirm the transfer order to move the quantity of 500 Speedstarletts from the storage bin in Warehouse 100 where you placed the materials previously (Chapter 3.2.4) to the receiving “storage bin”, which in this case is the outbound delivery document.

Within the tile group **Script 3 – Lead-to-Cash** select the app **Confirm Transfer Order**.

1. Enter the following data
 - **TO Number** *your Transfer Order number (Outbound Delivery)*
 - **Warehouse number** *100*
 - Press **Enter**.
2. Make sure that **your material** is contained in the transfer order and that it is transferred from the Storage Bin **STNB-X-XXX** to your **outbound delivery**.

D	Material	PInt	Batch	S	Typ	Stor. Bin	Target Quantity	AUn	C
<input checked="" type="checkbox"/>	SPEEDSTARLETT-9995	SD00		S	001	STBN-1-000	500	EA	
1	Speedstarlett-9995			D	004	0080000007	500		

Figure 169: Confirm Transfer Order: SAP-System-Screenshot

3. **Save (Post)** the transfer order confirmation. Press **Exit**.

3.4.5.6 Change of Status Outbound Delivery (2)

Now, look at the impacts of confirming transfer order (Outbound Delivery) on your delivery. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Change Outbound Delivery**.

1. Enter the number of your delivery document, choose **Enter** and open the **Status Overview** tab.
2. As you can see, there is also a **C** (completely processed) in the **WM activity status** (Warehouse Management Status) field, now.

Lieferung	GSK	PS	WM	Quitt...	WS	FS	SuSt...	TS	GSKR	LEB ...	Im W...	LBAS...
80000006	C		C	C	A	A		A				

Pos	Material	Kom...	PS	WM-...	Quitt...	WS	FS	Status...	LEBS...	LBAS...
10	SPEEDS1			C	C	A	A			

Figure 170: Change of Status Outbound Delivery (2): SAP-System-Screenshot

- Close the view without saving.

3.4.5.7 Enter Goods Issue

Now the picking of the material is completed and the product is transferred with the transfer order to the outbound stock area. You can deliver the product with an outbound delivery by posting the goods issue.

Within the tile group **Script 3 – Lead-to-Cash** select the app **Change Outbound Delivery**.

- Enter the **number** of your **delivery document** and press **Enter**.
- Ensure that the picking quantity and the delivery quantity on the **picking** tab are the same.

Outbound Deliv.:	80000007	Document Date:	23.10.2017						
Ship-to party:	25015		Taymaz Khatami / Denver 80220						
Item Overview		Picking	Loading	Transport	Status Overview	Goods Movement Data			
Pick Date/Time:		23.10.2017	00:00:	OverallPickStatus: C Fully picked					
Warehouse No.:		100	San Diego Warehouse	OverallWMStatus: C WM trsf ord confirmld					
All Items									
<input type="checkbox"/>	Itm	Material	Plnt	SLoc	Deliv. Qty	Un	Picked Qty	Un	Batch
<input type="checkbox"/>	10	SPEEDSTARLETT-9995	SD00	FG00	500	EA	500	EA	

Figure 171: Post goods Issue: SAP-System-Screenshot

3. Select **Post Goods Issue** (or **More → Post Goods Issue**). A message is issued that the delivery was saved. Finally, press **Exit**.

3.4.5.8 Display Document Flow

Display the document flow once again. Within the tile group **Script 3 – Lead-to-Cash** select the app **Change Outbound Delivery**.

1. Enter your **delivery number** and select the **Document Flow**.
2. You can see that the status of the delivery is now **Being processed**, while sales order, transfer order, and goods issue are already **Completed**.
3. Although delivery is completed physically (the customer received the goods!), the status of the delivery document is not completed, yet. This occurs only when the invoice for the delivery was created and thus, when the process “leaves” the SD module. After that, it is a “problem” of financial accounting.

Document	On	Status
Standard Order 0000000036	20.10.2017	Completed
→ Outbound Delivery 0080000007	23.10.2017	Being processed
WMS Transfer Order 0000002032	23.10.2017	Completed
GD goods issue:delvy 4900002109	23.10.2017	Complete

Figure 172: Document Flow Sales Order Process - Delivery: SAP-System-Screenshot

4. Finally, press **Exit**.

3.4.6 Billing Processing

After posting goods issue, you can create an invoice for products that were delivered physically to the customer. Carry out the billing process for your delivery and record the net value of the invoice.

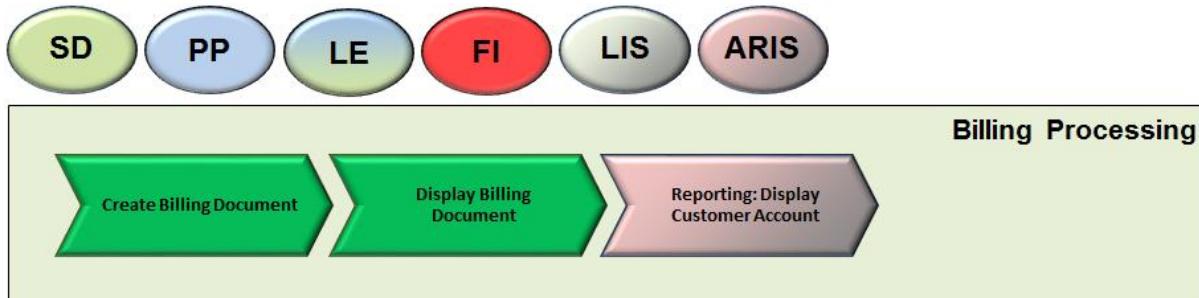


Figure 173: Process Overview: Billing Processing

3.4.6.1 Create Billing Document

Within the tile group **Script 3 – Lead-to-Cash** select the app **Create Billing Documents**.

- At the bottom of the screen, on the right-hand side click on the settings button and make sure all four options are set to **OFF**.

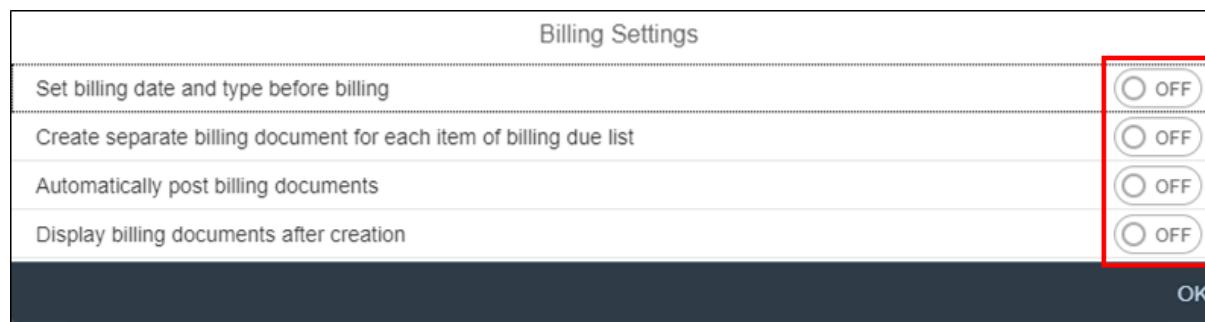


Figure 174: Billing Settings: SAP-System-Screenshot

- Now, in the **SD document** field, enter *your delivery number* and press **Enter**.
 - Select the line *containing your delivery* and press **Create**.
 - The system provides the billing number in a pop-up screen. Any notifications regarding output determination can be ignored. Write down this billing number on your data sheet.
- Billing Document:**

3.4.6.2 Display Billing Document

Display the generated billing document. document flow. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Display Billing Document**.

- Type in the number of your billing document and press **Enter**.
- List the **Net Value** of the invoice on your data sheet.

Net Value:

- Select the row containing your Speedstarlett and select **Pricing Conditions Header** to display the header data of the **pricing conditions**.

4. Select the **Conditions** tab. List the **Internal price** (**Condition Value** column) on the data sheet. What is the **profit margin (Standard - USA)** (**Condition Value** column) of the order?

Internal Price:

Profit Margin:

5. Go one step back () and select **Display Document Flow**.
6. You can see that the delivery was completed with billing accomplished. The invoice document is completed as well. Only one accounting document (the “problem” of financial accounting) was created that is not cleared, yet. This step will be completed when the customer pays the invoice.



If the status of the billing document (invoice) should be **BLOCKED**, go one step back into the initial screen of your billing document and select **More → Change**. Then, select **More → Billing → Release Accounting**.

NOTE

Business Partner 0000025015 Taymaz Khatami			
Document	On	Status	
Standard Order 0000000036	20.10.2017	Completed	
Outbound Delivery 0080000007	23.10.2017	Completed	
Invoice 0090000014	23.10.2017	Completed	
Accounting Document 0090000010	23.10.2017	Not Cleared	

Figure 175: Document Flow Sales Order Process - Billing: SAP-System-Screenshot

3.4.6.3 Reporting: Display Customer Account

Now check the current status of the customer account. First, display your customer account via the native app **Manage Customer Line Items** (S/4HANA+Fiori view) which focusses simplification. Therefore, within the tile group **Script 3 – Lead-to-Cash** select the app **Manage Customer Line Items**.

1. Within the **Customer** field, enter **your customer number** and confirm by pressing **Go**.
2. An overview of all billing and payment documents that were processed for this customer is displayed. So far the list only contains one item, which was generated when you created the billing document in the previous step. The column *Assignment* contains the billing document number (SAP SD) while the column *Journal Entry* contains the corresponding document number of the accounting document in SAP FI. Write down the accounting document number.

Accounting Document Number Billing:

Customer:		Company Code:		*Status:	Billing document		Date:			Hide Filter Bar		Filters (4)		Go	
25015 (TAYMAZ K...)	<input type="button" value=""/>		<input type="button" value=""/>	Open Items	Billing document	Open Items	24.10.2017								
Corresponding Accounting document															
Items (1) Standard *	<input type="button" value=""/>	Edit Line Items	Create Correspondence	Block for Dunning	Unblock for Dunning	Block for Payment	Unblock for Payment	<input type="button" value=""/>							
<input type="checkbox"/> Customer	Customer	Company ...	Clearing...	Assignment	Journal Entry ...	Journal Entry ...	Journal Entry...	Special G/L	Due Net (...)	Amount (CoCd Cur.)					
<input type="checkbox"/> 25015	US00			0090000014	23.10.2017	90000010	RV			1.100.000,00 USD					1.100.000,00 USD

Figure 176: Customer account S/4HANA (1): SAP-System-Screenshot

- Now, click on the number within the **Journal Entry** field and select **Manage Journal Entry**.

Customer:		Company Code:		*Status:	Open on Key Date:	
25015 (TAYMAZ K...)	<input type="button" value=""/>		<input type="button" value=""/>	Open Items	24.10.2017	<input type="button" value=""/>
Items (1) Standard						
<input type="checkbox"/> Customer	Customer	Company ...		Journal Entry	Journal Entry ...	Journal Entry...
<input type="checkbox"/> 25015	US00			90000010	RV	

Figure 177: Customer account S/4HANA (2): SAP-System-Screenshot

- Now, you see an overview of Journal Entries. In the **Line Items** area, you can see the customer account. Here you see that the reconciliation account 110000 was *debited* with 1.100.000 USD while the P&L account 600000 (Sales Revenue) was *credited*. Leave the view and turn back to the Home page of Fiori.

Journal Entry (90000010) - Entry View					
HEADER	0 ATTACHMENTS	0 NOTES	5 RELATED DOCUMENTS		
Journal Entry ... 23.10.2017	Company C... US00 (Global Bike Inc.)	Reference: 9995-ORDER			
Posting Date: 23.10.2017	Transaction USD	Ref. Transact...: VBRK (Billing document)			
Posting period: 10 / 2017	Header Text:				
Journal Entry.... RV (Billing Doc.Transfer)		Created: by MASTER on 23.10.2017			
Line Items (2) Standard					
Journal Entry Item	G/L Account	Profit Center	Debit	Credit	
000001	110000 (Trade Receivables)		1.100.000,00 USD	0,00 USD	<input type="button" value=""/>
000002	600000 (Sales Revenue)		0,00 USD	1.100.000,00 USD	<input type="button" value=""/>
Tax (0) Standard	G/L Account	Tax Base Amount	Debit	Credit	Tax Rate
		No data			

Figure 178: Customer account S/4HANA (3): SAP-System-Screenshot

Now, in addition to the steps above, display the data from the classic SAP ERP (as it was display via SAP GUI before SAP S/4HANA) view.

As you have learned from the Theory chapters, each customer account (customer master data ID) is an account in the Accounts Receivable sub-ledger (FI-AR). For instance, the customer ID 25015 from our example is simultaneously an account in FI-AR and is synchronized with the General Ledger (FI-GL) via the reconciliation account 110000, which was entered in the customer's master data. To check the customer account in FI-AR open the SAP Easy Access Menu, first. You have learned the proceeding in *Script 0 – Introduction* in detail. Following, it is shortly described again.

1. Within the tile group **Script 0 – Introduction** select the app **SAP Easy Access Menu**.
2. Select **More → GUI Actions and Settings → Show OK Code Field** to display the command field, enter transaction code **FBL5N** and confirm.



Alternatively, you can click on Start SAP Easy Access and follow the path:
Accounting → Financial Accounting → Accounts Receivable → Account → Display/Change Line Items (FBL5N)

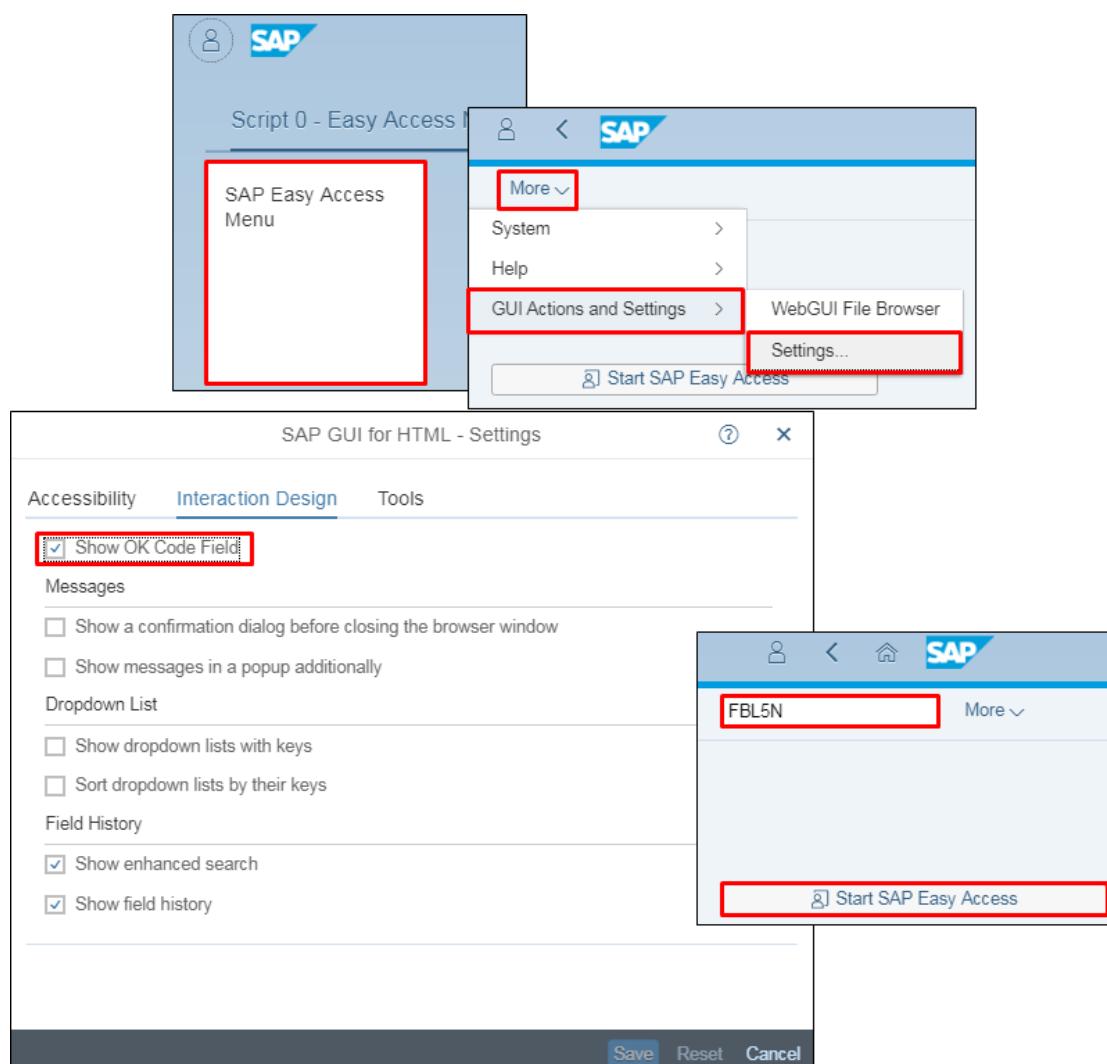


Figure 179: Using SAP Easy Access Menu

3. Enter
 - Customer account *your customer ID*
 - Company code *US00*
 - Open items *select*
 - Press *Execute*.

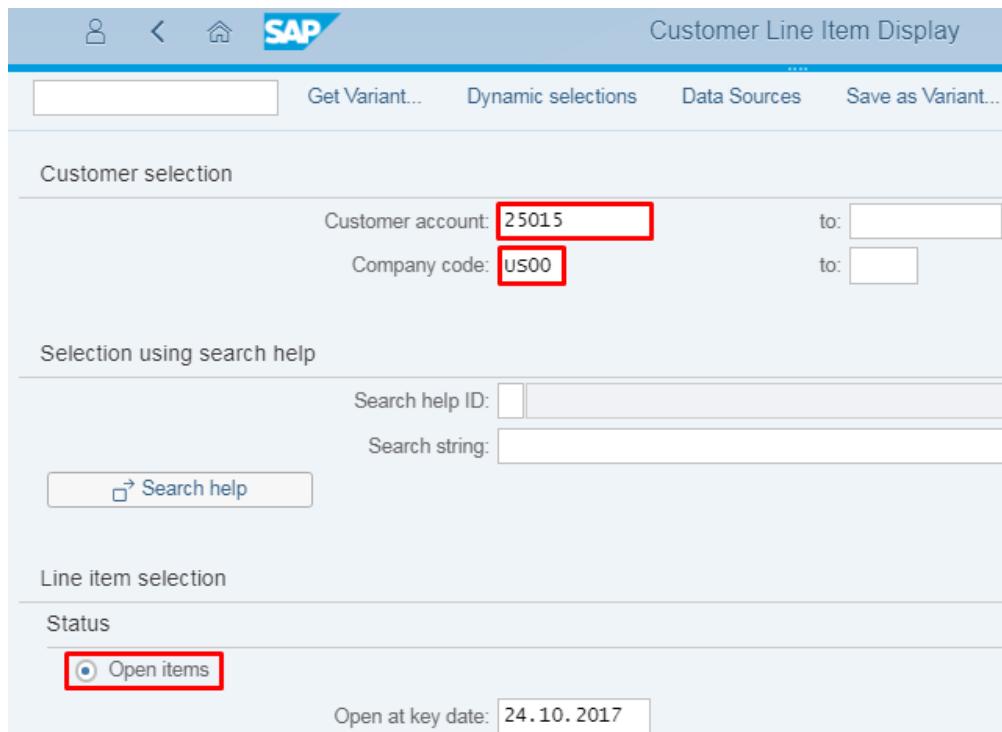


Figure 180: Customer Account in FI-AR (1): SAP-System-Screenshot

4. Double-click on the item (*document number* column) to see the details of the posting.

St	Assignment	DocumentNo	Typ	Doc..Date	S DD	Local Crcy	Amt	LCurr
<input type="checkbox"/>	0090000014	90000010	RV	23.10.2017	⚠	1.100.000,00	USD	
*						1.100.000,00	USD	
**	Account 25015					1.100.000,00	USD	

Figure 181: Customer Account in FI-AR (2): SAP-System-Screenshot

5. The Details of the accounting document are displayed.

Customer: 25015 Taymaz Khatami
CoCode: US00
Global Bike Inc. Denver
Line Item 1 / Invoice / 01
Amount: 1.100.000,00 USD
Additional Data
Bus. Area:
CD Base: 1.100.000,00 CD Amount: 0,00 USD
Payt terms: 0001 Days/Percent: 0 0,000 % 0 0,000 % 0
Bline Date: 23.10.2017
Pmnt block:
Payment Ref.: 0090000014

Customer account

Reconciliation Acocunt

G/L Acc.

Doc. No.

Accounting document

Billing document as Reference

Figure 182: Customer Account in FI-AR (3): SAP-System-Screenshot

From here you can take a more detailed look at the posting in SAP FI that was performed automatically when you created the billing document.

6. Click on [Call Up Document Overview](#) to see the details of the posting in the sub-ledger Accounts Receivable (SAP FI-AR).
 - First, the **Data Entry** view is displayed. This is the point of view of the Accounts Receivable sub-ledger (FI-AR) on the accounting document. You can see that in our case the customer account 25001 (of course your account number will differ since your own account is displayed) was **debited** with 1.100.000 USD while the P&L account 600000 (Sales Revenue) was **credited**.
 - By clicking on the **General Ledger View** button (or **More → General Ledger View**), you can display the same posting from the point of view of the General Ledger (FI-GL). Here you see that the reconciliation account 110000 was **debited** with 1.100.000 USD while the P&L account 600000 (Sales Revenue) was **credited**.

Note that these two views correspond to the same posting. That is, only one accounting document was generated when the billing document was created, which includes two different perspectives (FI-AR and FI-GL) on the same process.

Enterprise Resource Planning with SAP S/4HANA

Script 3: Lead-to-Cash Business Process

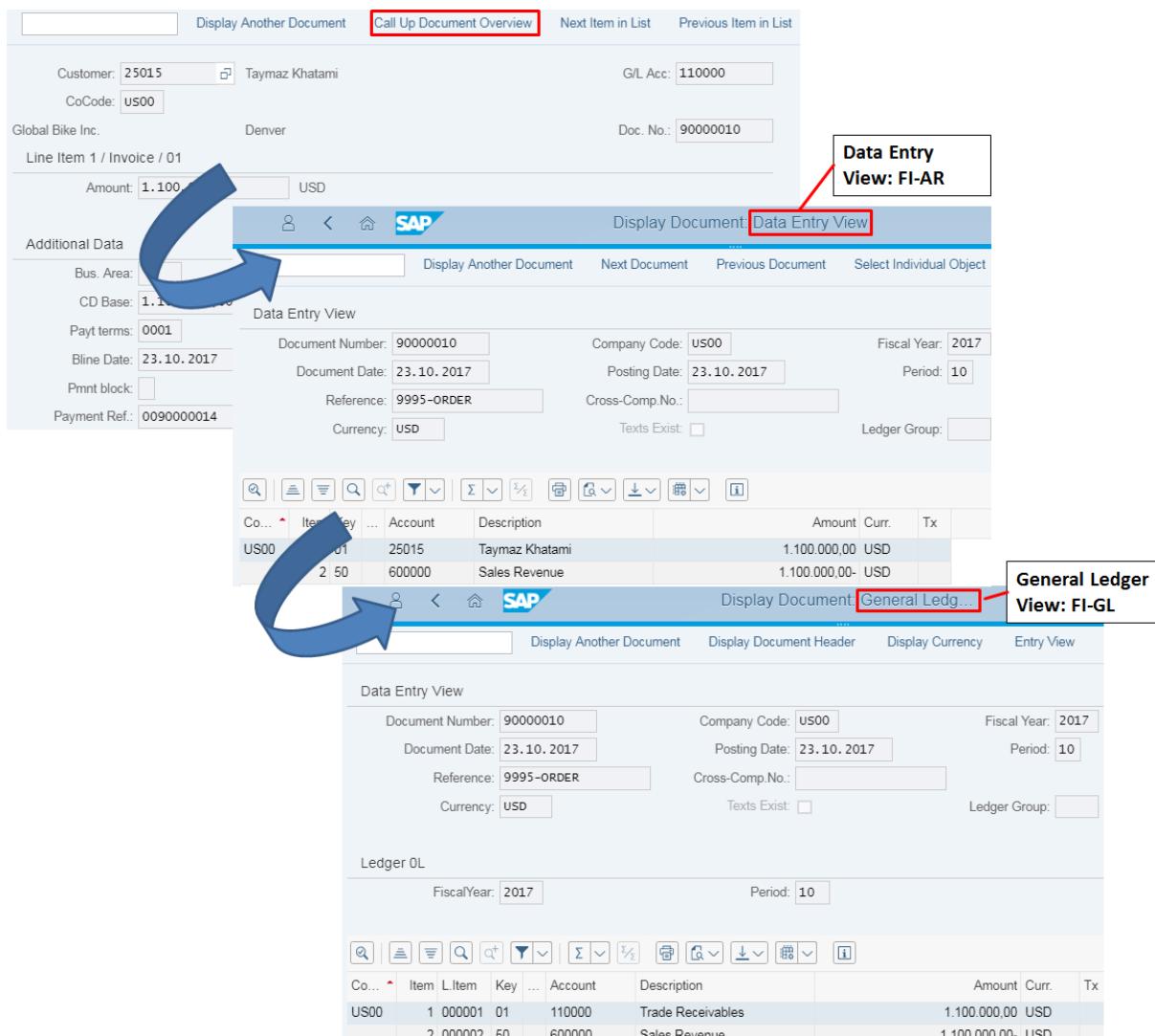


Figure 183: Customer Account in FI-AR (4): SAP-System-Screenshot

7. Leave the transaction.

3.4.7 Customer Payment

The last step of the Lead-to-Cash business process is the customer payment. The customer paid the invoice. Now the payment must be booked on the customer account.

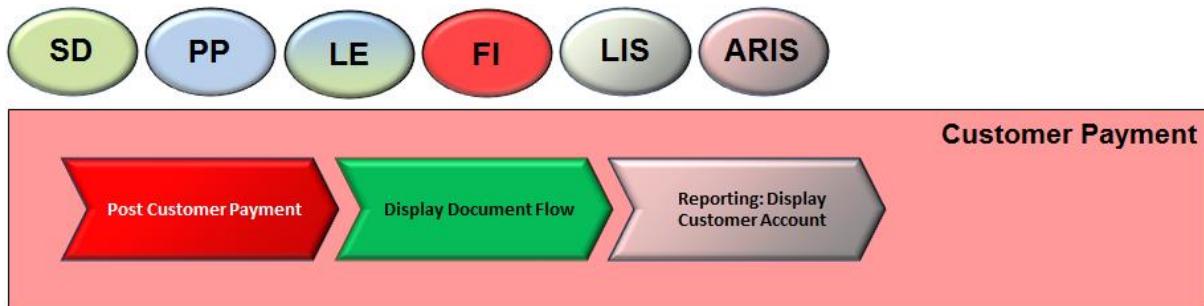


Figure 184: Process Overview: Customer Payment

3.4.7.1 Post Customer Payment

Within the tile group **Script 3 – Lead-to-Cash** select the app **Post Incoming Payments**.

1. On the *Post Incoming Payments* screen, enter the subsequent data:

- Company Code	US00
- Posting Date	<i>current date</i>
- Journal Entry Date	<i>current date</i>
- Journal Entry Type	DZ (Customer Payment)
- G/L Account	100000
- Amount	<i>Net value from your billing document</i>
- Currency	USD
- Account Type	Customer
- Account ID	<i>your customer ID</i>
- Press Propose Items .	

The screenshot shows the SAP 'Post Incoming Payments' interface. The top navigation bar includes icons for user, back, forward, SAP logo, and search. The title is 'Post Incoming Payments'. A message 'Balance: 0,00' is displayed. The main area has a section titled 'Payment' with a dropdown arrow. It contains two tabs: 'General Information' and 'Bank Data'. Under 'General Information', fields are filled with: Company Code (US00), Posting Date (24.10.2017), Journal Entry Date (24.10.2017), Value Date (dd.MM.yyyy), Reference, Period (00), and Journal Entry Type (DZ (Customer Payment)). Under 'Bank Data', fields include: G/L Account (100000), House Bank (empty), Amount (1.100.000,00), Fees (0,00), Assignment (empty), Exchange Rate (empty), and Amount/CCod... (0,00). To the right, there is an 'Open Item Selection' section with a note: 'Use this section to enter information (such as the invoice number, customer number, payment reference, or reason for payment) to help the system find the right items.' A 'Propose Items' button is located at the bottom right of this section. The status bar at the bottom right shows 'Proposed Items'.

Figure 185: Enter Incoming Payment of the Customer (1): SAP-System-Screenshot

2. The system now proposes the open item. Within the **Proposed Items** area, click on **Clear**. This step is necessary, since cleared items with 0 balance can be posted.

The screenshot shows the SAP Fiori Payment screen. It has two main sections: 'General Information' and 'Bank Data'. In 'General Information', fields include Company Code (US00), Posting Date (24.10.2017), Journal Entry Date (24.10.2017), Value Date (24.10.2017), Reference, Period (10), and Journal Entry Type (DZ (Customer Payment)). In 'Bank Data', fields include G/L Account (100000), House Bank, Amount (1.100.000,00), USD, Fees (0,00), Assignment, and Exchange Rate. At the bottom, there are tabs for 'Proposed Items', 'Post to G/L Account', 'Post on Account', 'Attachments (0)', and 'Notes (0)'. Below these tabs is a search bar with a 'Clear All' button, which is highlighted with a red box.

Figure 186: Enter Incoming Payment of the Customer (2): SAP-System-Screenshot

3. Save (*Post*) the document and list the *accounting document number*.

Accounting Document Number (Payment):

4. Leave the transaction.

3.4.7.2 Display Document Flow

Display the entire document flow one last time. Within the tile group **Script 3 – Lead-to-Cash** select the app **Change Outbound Delivery**.

1. Enter *your delivery number* and confirm with *Enter*.
2. Next, press the **Document flow** () button.
3. You can see that all documents that have been created during the process were completed or cleared, respectively.

The screenshot shows the Document Flow Sales Order Process - Payment screen. It displays a table of documents with columns for Document, On, and Status. The table includes:

Document	On	Status
Standard Order 0000000036	20.10.2017	Completed
→ Outbound Delivery 0080000007	23.10.2017	Completed
WMS Transfer Order 0000002032	23.10.2017	Completed
GD goods issue:delvy 4900002109	23.10.2017	Complete
Invoice 0090000014	23.10.2017	Completed
Accounting Document 0090000010	23.10.2017	Cleared

Figure 187: Document Flow Sales Order Process - Payment: SAP-System-Screenshot

3.4.7.3 Reporting: Display Customer Account

Finally, display the customer account once again. Either open the customer account via transaction code **FBL5N** or within the SAP Easy Access Menu, follow the path:

Accounting → Financial Accounting → Accounts Receivable → Account → Display/Change Line Items

1. Enter
 - **Customer account** *your customer ID*
 - **Company code** *US00*
 - **All items** *select*
 - Press **Execute**.

The screenshot shows the SAP Fiori interface for displaying a customer account. In the 'Customer selection' section, the 'Customer account' field contains '25015' and the 'Company code' field contains 'US00', both of which are highlighted with red boxes. In the 'Line item selection' section, the 'All items' radio button is selected (highlighted with a red box), and other fields like 'Open at key date' and 'Posting date' also have red boxes around them.

Figure 188: Customer Account in FI-AR (1): SAP-System-Screenshot

2. Again, the overview of the customer account is displayed. Now you can see that the customer payment posting has created a new item, which clears the original posting from the billing document. Thus, the customer account is balanced out (Total amount 0). Double-click on the new item (accounting document number for payment) to see the details of the posting.

The screenshot shows a SAP system interface for managing customer accounts. At the top, there are fields for Customer (25015), Company Code (US00), Name (Taymaz Khatami), and City (Denver). A red arrow points from a callout box labeled "Accounting document for the payment" to the list of accounting documents below. The list includes two entries: one for a billing document (Document No. 1400000005) and one for a payment document (Document No. 0090000014). Both entries show a debit to account 25015 and a credit to account 100000 (Bank). The final row shows a balance of 0,00 for account 25015.

St	Assignment	Document No	Typ	Doc.. Date	S	DD	Local Crcy	Amt	LCurr	Clrng doc.
<input type="checkbox"/>	[green square]	1400000005	DZ	24.10.2017			1.100.000,00-	USD	1400000005	
<input type="checkbox"/>	[green square]	0090000014	RV	23.10.2017			1.100.000,00	USD	1400000005	
*	[green square]						0,00	USD		
** Account 25015							0,00	USD		

Figure 189: Customer Account in FI-AR (2): SAP-System-Screenshot

The Details of the accounting document are displayed. From here you can take a more detailed look at the posting in SAP FI that was performed automatically when you booked the customer payment.

- Click on [Call Up Document Overview](#) to see the details of the posting in the sub-ledger Accounts Receivable (SAP FI-AR).
 - First, the **Data Entry View** is displayed. This is the point of view of the Accounts Receivable sub-ledger (FI-AR) on the accounting document from the payment. You can see that the customer account 25015 was **credited** with 1.100.000 USD while the Balance sheet account 100000 (Bank) was **debited**.
 - By clicking on the button [General Ledger View](#), you can display the same posting from the point of view of the General Ledger (FI-GL). Here you see that the reconciliation account 110000 was **credited** with 1.100.000 USD while the Balance sheet account 100000 (Bank) was **debited** when the money was received on the bank account.

Note that with this second posting, the amount from the billing document posting was cleared. That is,

- After the billing document posting the customer account (and the reconciliation account) was **debited** with 1.100.000 USD.
- After the payment document posting the customer account (and the reconciliation account) was **credited** with 1.100.000 USD.

Thus, the accounts balance is again at 0, which was also reflected in the overview of transaction FBL5N.

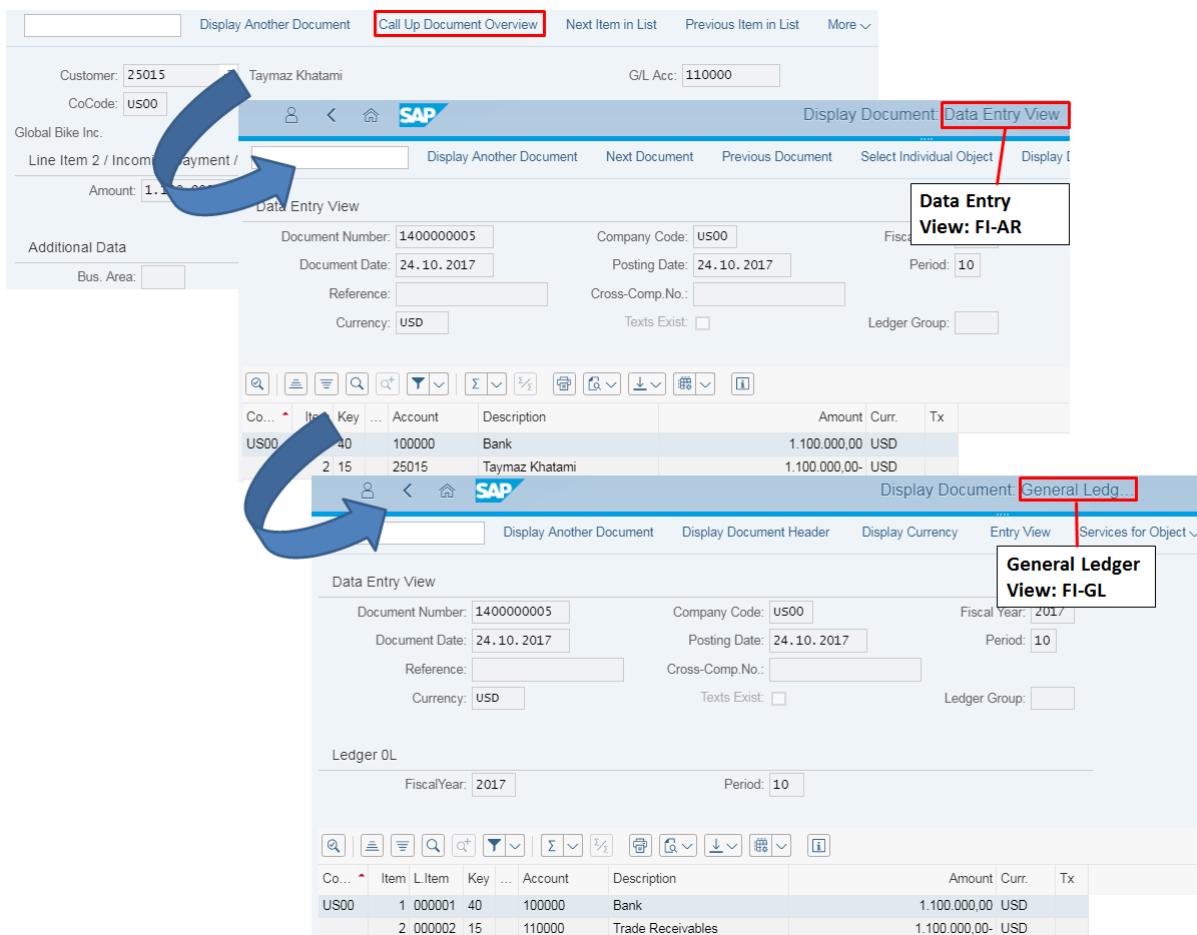


Figure 190: Customer Account in FI-AR (4): SAP-System-Screenshot

4. Leave the transaction.

With this, the **Lead-to-Cash business process** is completed. Now you can focus on the information systems in sales and distribution.

3.4.8 Reporting using the Sales Information System

The sales department needs to carry out reporting and analyses on document level for the current sales processes. You will now learn to handle the list display functions.

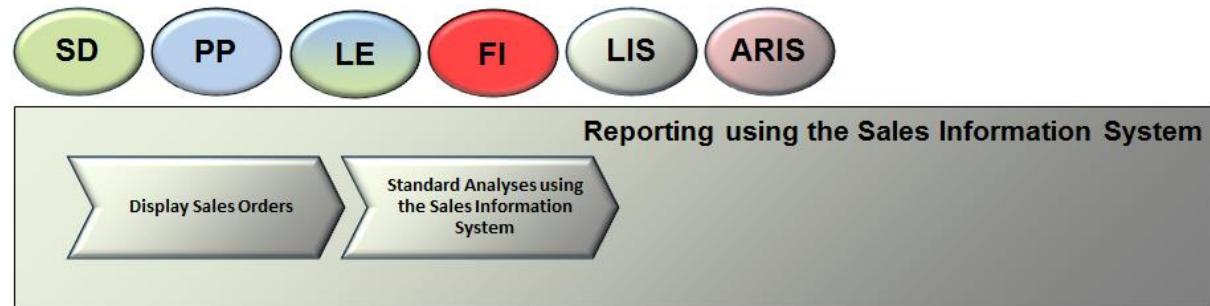


Figure 191: Process Overview: Reporting using the Sales Information System

3.4.8.1 Display Sales Orders

Display a report for all sales orders of your own *customer*. Within the tile group **Script 3 – Lead-to-Cash** select the app **List Sales Orders**.

1. On the **List of Sales Orders** screen, enter the number of *your customer* in the **Sold-to party** field and **UW00** as **Sales Organization**.
2. Make sure that all other fields are empty and execute.
3. You receive a trivial list with only one entry, namely the sales document from the previous cash to order process.
4. Now adjust the presentation of the data. Therefore, click on the **Change Layout** () button.
5. Decide on your own, which data you want to display. If you want to display an entry, move it to the **Displayed Columns** area. If you want to hide data, move the respective data to the right side (**Column Set** area). Therefore, mark the entry and use (Hide) or (Show).
6. Finally, confirm with **Transfer** (). You should receive a presentation similar to the following figure.

The screenshot shows the SAP Fiori interface for the "List of Sales Orders (1 Entry)" screen. The top navigation bar includes icons for user profile, back, home, and SAP logo. The main header is "List of Sales Orders (1 Entry)". Below the header is a toolbar with search, filter, print, find, and more options. The data table has the following columns: Created by, Purchase Order Number, Doc. Date, Sales doc. type, Sales document, Item, Sold-to pt, Material, Order Quantit..., Sal..., Net Value (Item), and Currency. A single row is displayed: WIP9-995, 9995-Order, 20.10.2017, OR, 36, 10 25015, SPEEDSTARLETT-9995, 500 EA, 1.100.000,00 USD.

Figure 192: Sales Orders List: SAP-System-Screenshot

7. Leave the report.

3.4.8.2 Standard Analyses using the Sales Information System

Your boss asked you to check the sales history per customer for your sales organization by performing a standard customer analysis in the sales information system. Create a top 10 list of customers according to sales and display the data graphically. Since you will carry out this report frequently, save a report version.

Perform a customer analysis in the ***sales information system*** for sales organization ***UW00***. The analysis is supposed to be carried out in the period from ***January 2004*** until the ***current date***. Within the tile group **Script 3 – Lead-to-Cash** select the app ***Customer Analysis***.

1. On the ***Customer Analysis: Selection*** screen, enter the subsequent data:
 - **Sales Organization** ***UW00***
 - **Period from** ***01.2004***
 - **Period until** ***current period***
 - **Delete** the entries in all other fields.
 - To save this variant in an ***individual variant***, choose ***Save as Variant*** or ***More → Save as Variant***.
 - Enter **Variant Name** ***Sales-xyyy*** and enter ***Sales Report xyyy*** in the **Description** field.
 - **Save** again.
 - Execute (**Execute**) the report.
2. To display the top 10 customers, click on the column header **Sales Volume** and choose the ***TOP N*** or ***More → TOP N***. On the next screen, enter ***10*** in the number field and select ***Continue***.
3. Display **customer ID** and **names** by choosing ***More → Settings → Characteristic display → Keys and description*** from the menu.
4. Since the column width is not sufficient to display both customer ID and name, adjust the column width. Click the column header **Sold-to Party** and select ***More → Settings → Column width → Characteristic*** from the menu. Enter the number ***40*** for the column width and confirm your entry.
5. Add the key figure ***Billing quantity*** and remove the key figure ***Credit Memo***. Therefore, choose ***More → Edit → Choose Key Figures***. Select the measure ***Credit Memo*** on the left hand side of the screen. Select ***Do not choose*** . On the right hand side, select ***Billing quantity***. Press ***Choose*** . Confirm with

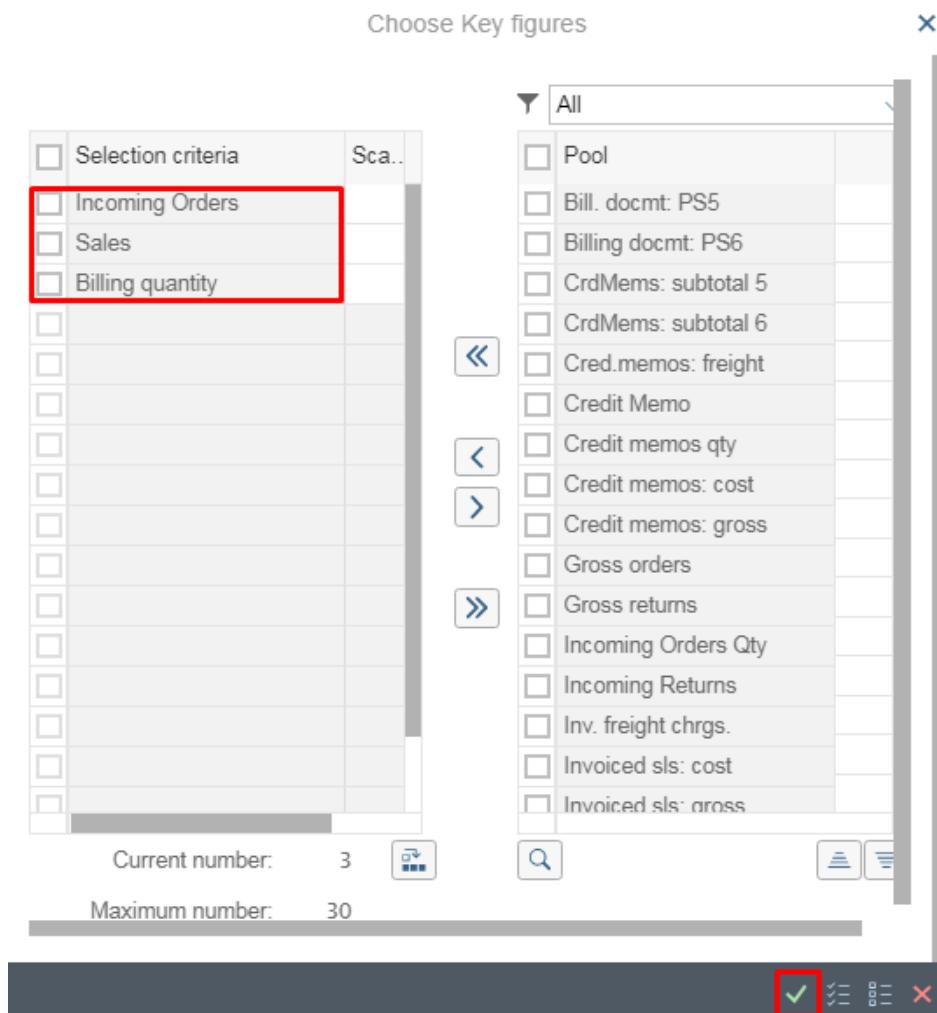


Figure 193: Choose Key Figures: SAP-System-Screenshot

6. List the name of your most important customer regarding *Sales Volume* figures on your data sheet.

Biggest Customer:

7. **Drill down** to display details for your customer. Drill down until the statistics is displays by period. Therefore, double-click on the ***name*** of your biggest customer.
8. Leave the report ***without*** saving.

Data Sheet

Congratulations! You completed the **Lead-to-Cash Business Process** case study.

The subsequent case studies are based on the results of this case study. In case your data differs from the description in the script, please contact your tutor prior to processing another case study.

Finally, please **submit the carefully completed data sheet** to your tutor (use support email address from the welcome mail) for the case study **Lead-to-Cash Business Process**.

Please comply with the naming rules. Non-compliant data sheets will not be accepted; i.e. rename the document that you downloaded from this course's download area as follows:

03-Lead-to-Cash-xxxx-zzz-lastname.doc

Thereby, you need to replace **xxxx** with your user number **without** the “**WIP**“ and without the hyphen (WIPx-yyy) and replace **zzz** with the number of the client you are working on.

Example:

Your name is **Max Mustermann**, you are working on **client 700**, and your **user number is WIP9-999**. Then, name the document as follows:

03-Lead-to-Cash-9999-700-Mustermann.doc

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