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This sample chapter explains demand planning and compares the different production methods in make-to-stock (MTS), make-to-order (MTO), and assemble-to-order (ATO) planning. It covers the different planning strategies associated with these production types, as well as strategies to support component planning. The chapter ends by discussing the differences between planned independent requirement (PIR) consumption and PIR reduction, as well as tips for organizing PIRs. Like all chapters, it contains practice questions with detailed answers to help you better understand the topic.



“Demand Management”



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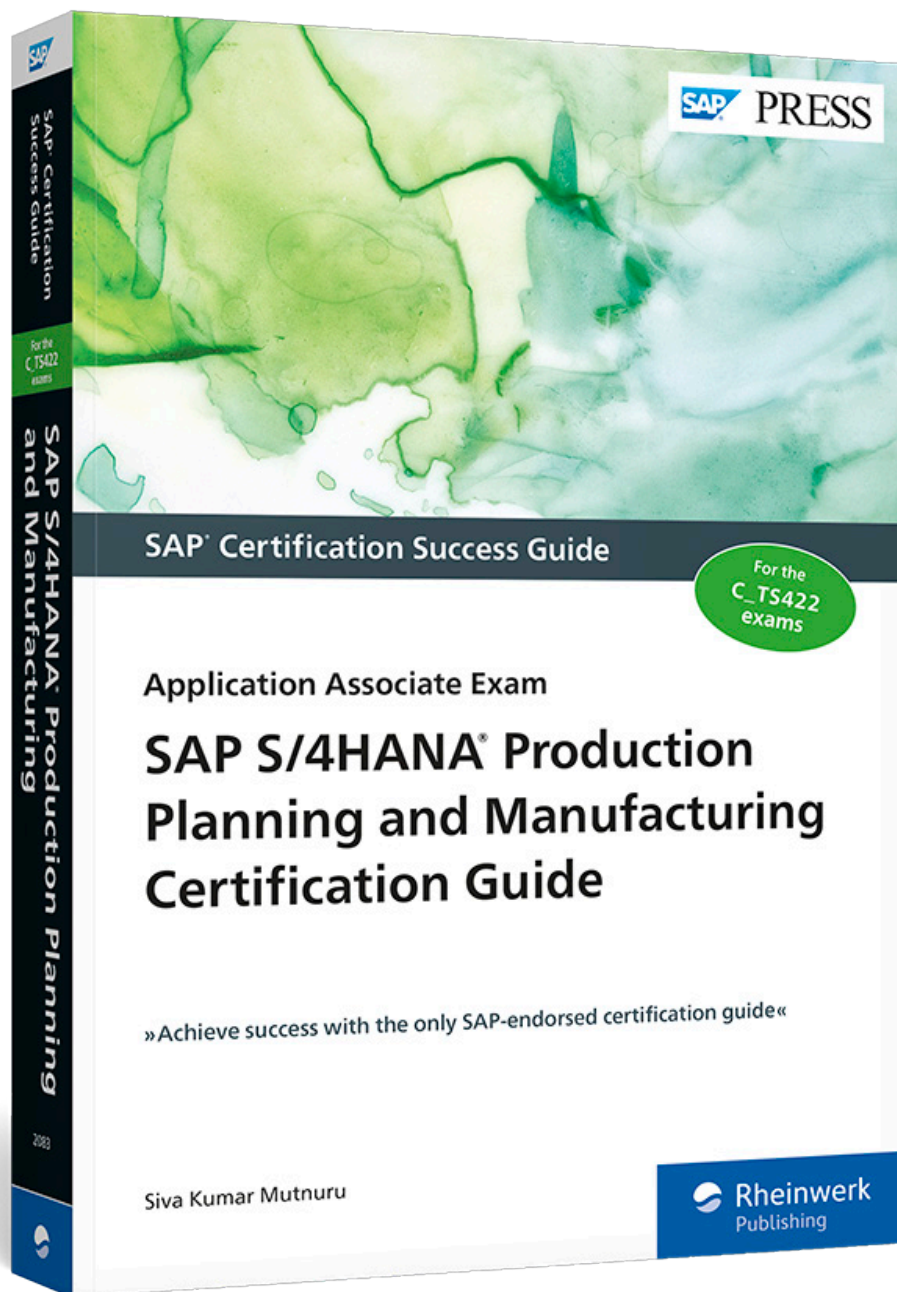
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Chapter 3

Demand Management

3

Techniques You'll Master

- Demand management and demand planning
- Make-to-stock (MTS), make-to-order (MTO), and assemble-to-order (ATO) scenarios
- Strategies supporting the planning of components
- Different planning strategies associated with production types
- Differences between planned independent requirement (PIR) consumption and PIR reduction
- Reorganization or housekeeping of PIRs

The focus of this chapter is to explain demand planning and compare the different production methods in MTS, MTO, and ATO planning. It's important to understand how to troubleshoot and customize various planning strategies. Managing PIRs and various master data field-level information is also important during implementation situations.

Real-World Scenario

As a production planning consultant, you'll be required to understand the business of the customer, classify various products, and suggest appropriate planning strategies. You'll also set up the demand planning considering various sources of forecast that may be from other systems. The consultant should have a thorough understanding of demand management concepts to discuss them and suggest those that suit the customer requirements.

In a manufacturing organization, different products or product groups may be classed under different production types. By asking the appropriate questions, you can find out how best the out-of-the-box SAP S/4HANA features or functionalities can be suggested and adapted to the business needs. If the demand management is implemented efficiently and effectively, then half the battle is already won during an SAP S/4HANA implementation.

If needed, the consultant should be able to undertake customization of new planning strategies by collaborating with sales and distribution consultants. This knowledge will be useful in managing support cases/issues also.

3.1 Objectives of This Portion of the Test

The objective of this portion of the certification is to test your knowledge in demand management and understanding of planning strategies with which you differentiate various production methods:

- Types of planning strategies and their differences
- Planning strategy to use in specific manufacturing environments
- Managing PIRs
- PIR consumption and reduction
- Influence of relevant fields in the material master on overall demand management.



Note

The demand management topic makes up 8% of the total exam.

3.2 Consumption Process and Logic

Demand management is an important activity in an organization where the customer requirements are forecasted, reconciled, and adopted to make a meaningful demand program. An effective demand program is the backbone and key input for the production plan. It's not only a forecasting process for anticipated production to meet customer demands but also a mechanism to handle real customer demands or orders in an effective way. In the overall production program where demand quantities and dates for finished products are managed, the forecast is created and managed as a PIR. In SAP S/4HANA, the output of demand management is fed into material requirements planning (MRP).

Demand planning is a separate module in SAP Advanced Planning and Optimization and SAP Integrated Business Planning for Supply Chain (SAP IBP), and extensive functionalities are available to perform demand planning. The main aim of demand planning is to forecast the demand, which can be performed in the SAP S/4HANA system, other SAP systems, or by using any third-party tools. The forecast can be translated into PIRs in the SAP S/4HANA system.

To create a demand program, the finished products or assemblies are carefully classified and analyzed, and an appropriate planning strategy is assigned. Deciding on the planning strategy for a specific product involves deciding on the overall manufacturing philosophy of the organization, which involves how the product is planned, produced, or procured. This is where the decision of whether a product will be produced for make-to-stock (MTS), make-to-order (MTO), or any other strategy is determined.

In SAP S/4HANA, the consumption process is to compare PIRs and dates with actual customer requirements or sales orders. The consumption process is defined in the Customizing for each planning strategy.

As in Figure 3.1, the consumption mode and consumption periods must be maintained in the **MRP 3** view of the material master or in the customization for demand management. **Consumption mode** determines in which direction the sales orders consume the PIRs: there are four options available to select from backward, forward, or both consumption types. If the consumption mode is maintained as forward consumption, the system will consider the PIR quantity directly after the sales order in the time axis; if backward consumption, the system looks for the PIR quantity that exists before the sales order. The consumption period is maintained in workdays and is valid from the current date. Depending on the consumption mode, sales orders, dependent requirements, and material reservations will consume PIR quantities that fall within the consumption period.

Figure 3.1 MRP 3 View: Consumption Mode and Consumption Periods

There are five options for consumption mode:

- Backward consumption only
- Backward/forward consumption
- Forward consumption only
- Forward/backward consumption
- Period-specific consumption (added in SAP S/4HANA; the other four options were available in SAP ERP also)

If you maintain the **Consumption mode** field but not the consumption periods, then the consumption of requirements will happen that are planned for the same day.

If you don't maintain a **Consumption mode** in the material master, the system uses the consumption parameters from the MRP group that is assigned to the material. If a consumption mode isn't specified in the MRP group also, the **Consumption mode** is set to 1 by default (backward consumption only) with a (backward) consumption period of 999 days.



Note

Consumption will always happen even though the parameters aren't maintained in the material master.

In the standard SAP S/4HANA system, you must maintain the consumption mode to maintain consumption periods.

3.3 Planning Strategy

In this section, we'll provide an overview of the planning strategy and then cover different strategies for MTS production.

The planning strategy holds an appropriate procedure to plan and produce a material. This is the integration or link between the production planning and manufacturing module and sales and distribution module in SAP S/4HANA. The planning strategy is the place where the requirement types of PIRs (demand management) and the requirement types from customer requirements are combined in Customizing. Figure 3.2 shows the planning strategy customization settings (Transaction OPPS) for planning **Strategy 40**.

Figure 3.2 Planning Strategy Customization

The requirements class of PIRs is linked to the requirement type of PIRs in Transaction OPM1; this customization node is available under **Production**.

In the customization area of sales and distribution, the requirement types of customer requirements defined in Transaction OVZG are combined with the requirement types of customer requirements in Transaction OVZH. Apart from these combinations, the planning strategy also holds the consumption indicator, availability check, assembly type and configuration, and so on.

The planning strategy must be assigned to a planning strategy group in the customization. In the planning strategy group, apart from the main strategy, it's also possible to assign up to seven alternative strategies, as shown in Figure 3.3. In the standard SAP system, there are some out-of-the-box planning strategies where the main strategy and alternate strategy are also given. Figure 3.3 shows planning strategy 41 where the **Main Strategy** is 40 (**Planning with Final Assembly**) and the

alternate **Strategy is 20 (Make-to-order production)**. The other examples include planning strategy 31, 32, and 33.

The main strategy will be proposed during demand management or sales order processing. It's possible to change the main strategy and replace with other strategies maintained in the planning strategy group.

The planning strategy group is maintained in the material master **MRP 3** view.

Figure 3.3 Planning Strategy Group

3.4 Strategies for Make-to-Stock Production

The main aim of the MTS environment is to provide superior customer service and make the product available as and when the customer wants it. So, in anticipation of customer orders, the stock will be produced in advance; then, as and when sales orders arrive, these orders are fulfilled from the warehouse stock. It's important to have a demand plan for these kind of products to reduce inventory-carrying costs.

In the following sections, we'll discuss some of the important MTS planning strategies: net requirements planning (planning strategy 10), gross requirements planning (planning strategy 11), planning with final assembly (planning strategy 40), and production by lot size (planning strategy 30).

3.4.1 Net Requirements Planning (Planning Strategy 10)

With this strategy, only PIRs influence production or procurement, which means the main aim of following the demand plan will be achieved, and sales orders won't influence or impact the overall demand plan. Sales orders will be displayed in the stock/requirements list, but they won't be part of net requirements calculation in MRP. Because the sales orders aren't relevant for MRP, the consumption of PIRs won't take place in this strategy. The oldest PIRs will be reduced by goods issue for the sales order delivery. This planning strategy is useful in mass production environments and is often combined with repetitive manufacturing.

This strategy is useful for products with seasonal demand where production needs to be smoothed. It uses the following requirement types:

- For independent requirements: LSF
- For customer requirements: KSL

As shown in Figure 3.4, for net requirements planning, the MRP element **IndReq** has **LSF** as its requirements type. Even though there is a customer order, it's only for informational purpose.

A...	Date	MRP e...	MRP element data	Rescheduling...	E...	Receipt/Reqmt	Available Qty	Pro...	Stor...
	21.01.2021	Stock					0		
	01.01.2021	IndReq	LSF			100-	100-		
	22.01.2021	PldOrd	0000000552/STCK	01.01.2021	30	100	0	0001	171A
	01.02.2021	PldOrd	0000000553/STCK			100	100	0001	171A
	01.02.2021	IndReq	LSF			100-	0		
	01.03.2021	PldOrd	0000000554/STCK			100	100	0001	171A
	01.03.2021	IndReq	LSF			100-	0		
	01.04.2021	PldOrd	0000000555/STCK			100	100	0001	171A
	01.04.2021	IndReq	LSF			100-	0		

Figure 3.4 Stock/Requirements List: Net Requirements Planning

Warning

For this strategy, the oldest PIRs are reduced first, and consumption mode isn't relevant. However, if the sale from stock exceeds the total PIR quantity in the past because of unplanned sales orders, then PIRs in the future are reduced if a corresponding entry is maintained in the consumption period.

3.4.2 Gross Requirements Planning (Planning Strategy 11)

For this strategy, there are many similarities with planning strategy 10 (net requirements planning). The main difference is that on-hand stock isn't considered during MRP, which means only planned quantities are produced. This strategy is mainly used where it's not possible to stop production even though the stock is available. This strategy is useful in cement, steel, or pig iron-making industries, where continuous production occurs, and shutdown of production isn't an option to optimize planning.

One additional master data parameter to be maintained for this planning strategy is setting the **Mixed MRP** field to **2** (gross requirements planning) in the **MRP 3** view (refer to Figure 3.1). As in planning strategy 10, sales orders also won't have any influence on planning for this strategy, so there's no consumption of PIRs. Reduction of PIRs takes place during goods issue for production orders, planned orders

(repetitive manufacturing), or purchase orders (trading goods). As shown in Figure 3.5, there is a special segment in the stock/requirements list, **Gross Requirements Planning**, for all the relevant PIRs and procurement elements.

This strategy uses the following requirement types:

- For independent requirements: BSF
- For customer requirements: KSL

As shown in Figure 3.5, for gross requirements planning, the **MRP element IndReq** has **BSF** as its requirements type. Even though a stock of 300 PC is available, the system planned for an additional 300 PC to fulfill PIRs.

A...	Date	MRP e...	MRP element data	Rescheduling...	E...	Receipt/Reqmt	Available Qty	Pro...	Stor...
	21.01.2021	Stock					0		
	20.01.2021	CusOrd	0000000133/000010/0001			75-	75-		
	21.01.2021	----->	Gross Requirements Plan						
	01.01.2021	IndReq	BSF			100-	100-		
	22.01.2021	PldOrd	0000000556/STCK	01.01.2021	30	100	0	0001	171A
	01.02.2021	PldOrd	0000000557/STCK			100	100	0001	171A
	01.02.2021	IndReq	BSF			100-	0		
	01.03.2021	PldOrd	0000000558/STCK			100	100	0001	171A
	01.03.2021	IndReq	BSF			100-	0		
	01.04.2021	PldOrd	0000000559/STCK			100	100	0001	171A
	01.04.2021	IndReq	BSF			100-	0		

Figure 3.5 Stock/Requirements List: Gross Requirements Planning

3.4.3 Planning with Final Assembly (Planning Strategy 40)

Planning strategy 40 is the most widely used planning strategy. This strategy combines the features of both MTS and MTO strategies, where sales orders will have influence on planning. In this strategy, MRP will generate planned orders to cover the PIRs if existing stock or planned receipts don't cover the PIRs. MRP will also consider sales orders if they exceed the PIR quantity, meaning the maximum from sales orders or PIRs will always be planning relevant.

Incoming sales orders consume PIRs so that the planning situation is always adjusted to suit the current requirements and to avoid duplicate manufacturing. This consumption of PIRs is based on the parameters either maintained in the material master or from the parameters maintained in the customization of the MRP group. With this strategy, it's possible to react quickly to customer requirements.

In Figure 3.6, the PIRs were maintained at 100 PC each on a monthly bucket from January to April. The incoming sales order consumed the PIR quantity, and the remaining PIR for the month of January is only 25 PC.

A...	Date	MRP e...	MRP element data	Rescheduling...	E...	Receipt/Reqmt	Available Qty
	20.01.2021	Stock					0
	01.01.2021	IndReq	VSK			25-	25-
	20.01.2021	CusOrd	0000000133/000010/0001			75-	100-
	01.02.2021	IndReq	VSK			100-	200-
	01.03.2021	IndReq	VSK			100-	300-
	01.04.2021	IndReq	VSK			100-	400-

Figure 3.6 Stock Requirements List: Planning with Final Assembly

This strategy uses the following requirement types:

- For independent requirements: VSK (planning with final assembly)
- For customer requirements: KSV (sales order with consumption)

Note

It's not required to have **Availability check** selected in the material master field in the **MRP 3** view while using this strategy, as this field won't impact the planning process of strategy 40.

3.4.4 Production by Lot Size (Planning Strategy 30)

Planning by lot size is only based on sales orders or sales scheduling agreements. Several sales orders can be grouped together for production collectively in a single lot. This can be achieved by lot size optimization or the rounding mechanism. As the production is purely based on sales orders, it will be challenging to anticipate the production volumes and the component requirements. Therefore, procurement of components can be performed by using planning strategy 70 (kanban components or consumption-based components). In some situations, or during production optimization, it's better to produce to a lot size, for example, for foundry operations or steel melting, where it's always economical to produce to full furnace capacity. This planning strategy is used where the production is for major customers, and the leftover stock will be sold in smaller quantities.

With this strategy, there is no need for PIRs because sales orders or schedule lines will be consumed by the deliveries. If any goods issue is made against a specific sales order, then the sales order quantity will be reduced by the system.

This strategy uses the following requirement types:

- For independent requirements: LSF (MTS production)
- For customer requirements: KL (sales order manufactured by lot size)

3.5 Strategies for Make-to-Order Production

If planning the finished product isn't possible or isn't required and based on only a specific customer requirement when the production is carried out, then this production method is MTO production. MTO production only starts when a sales order is received. Subsequently, in this section, we'll cover the MTO production (planning strategy 20), planning without final assembly (planning strategy 50), and planning with planning material (planning strategy 60) strategies.

3.5.1 Make-to-Order Production (Planning Strategy 20)

Production or procurement will only be initiated after receiving the sales order. The existing stock for the finished product won't be considered during planning. Each sales order is planned separately in an individual segment. As shown in Figure 3.7, these stock segments are created automatically when a sales order is created. Products of high value or unique nature can be produced with this production type. This strategy is used when it's hard to predict or forecast the final product. There are no PIRs involved or needed for the finished product, but to reduce the overall lead times, components can be planned with appropriate strategies separately. The sales order quantity and the requirements will be reduced with the goods issue to the order. In the MTO production, sales orders and receipts (planned orders and then production orders) are linked; that is, they have fixed pegging. When the goods receipt to production order is posted, it will be posted to the like sales order and line item's special stock. The production quantities can't be exchanged between the sales orders.

Starting from the sales order at the finished product level, the MTO production can extend to as many levels of the bill of materials (BOM) as needed. This can be achieved by maintaining the **Individual/Coll.** field in the material master **MRP 4** tab as **1-Individual Requirements Only**. It will be planned under sales order special stock.

This strategy uses the following requirement types:

- Requirements type for independent requirements: blank
- Requirements type for customer requirements: KE (individual sales order without consumption)

A...	Date	MRP e...	MRP element data	Rescheduling...	E...	Receipt/Reqmt	Available Qty	Pro...	Stor...
	21.01.2021	Stock					0		
	21.01.2021	CustSt	0000000142/000010				0		
	21.01.2021	CusOrd	0000000142/000010/0001			85-	85-		
	22.01.2021	PldOrd	0000000565/so			85	0	0001	171A
	21.01.2021	CustSt	0000000143/000010				0		
	21.01.2021	CusOrd	0000000143/000010/0001			75-	75-		
	22.01.2021	PldOrd	0000000566/so			75	0	0001	171A
	21.01.2021	CustSt	0000000144/000010				0		
	21.01.2021	CusOrd	0000000144/000010/0001			150-	150-		
	22.01.2021	PldOrd	0000000567/so			150	0	0001	171A

Figure 3.7 Stock Requirements List: MTO Production

3.5.2 Planning without Final Assembly (Planning Strategy 50)

Planning with planning material is one of the most widely used planning strategies in MTO scenarios. The main aim of this planning strategy is to allow planning of components and delay the final assembly until the receipt of the sales order. In this strategy, with reference to the PIRs entered for the finished product, the system creates planned orders of order type VP, which are nonconvertible; they are relevant for production only after the receipt of the sales order. We'll see a special planning segment called **Preplanning** in the stock/requirements list for these planned orders. This type of planned order is created so that the BOM can be exploded, and the dependent requirements are passed on to the components.

The assemblies or components are produced or procured and placed in stock well before the sales order for the final product is entered. Final assembly is triggered after the sales order has been received. The incoming sales order consumes the PIRs, which reduces the nonconvertible planned order quantity.

In this strategy, an availability check is performed only based on PIRs. A finished product is considered available if an unconsumed PIR is available for that material. The **ATP Check** indicator in the material master isn't relevant because the availability checks according to available-to-promise (ATP) logic doesn't take place.

This strategy uses the following requirement types:

- For independent requirements: VSE (planning without final assembly)
- For customer requirements: KEV (MTO with consumption)

3.5.3 Planning with Planning Material (Planning Strategy 60)

Usage of the strategy planning with planning material is justified if one or more of the components are shared between many finished products and similarities in

the manufacturing process. In this strategy, all the common parts are grouped together under a planning material. This planning material is never produced, but it will pass on the dependent requirements from the finished product to the components belonging to the planning material.

As shown in the Figure 3.8, both the finished product and the planning material should have the planning Strategy Group maintained as 60. The finished product should contain the Planning Material, Planning Plant, and Plng conv. factor (planning conversion factor) maintained. In the planning material, the appropriate consumption parameters should be maintained.

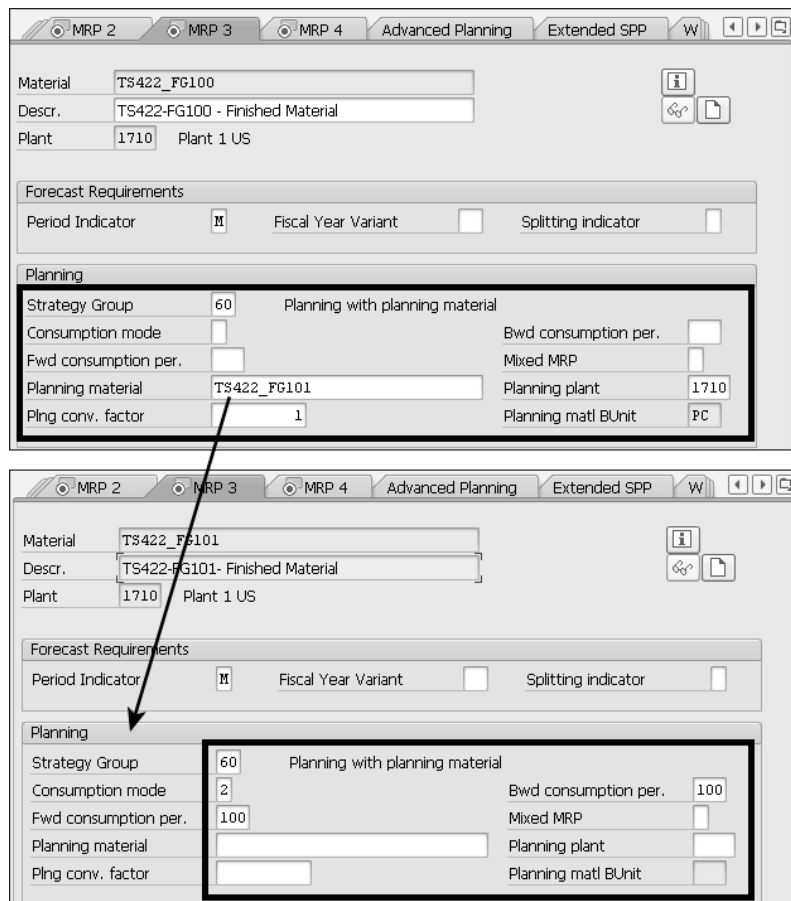


Figure 3.8 Material Master Settings for Both the Finished Material and the Planning Material

In this strategy, PIRs are created for planning material. Planned orders of type VP are created in the subsequent planning run, and the dependent requirements are passed on to the components for the early procurement and to reduce the overall lead time for production or procurement purposes. The VP planned orders are nonconvertible or can't be changed manually. As shown in Figure 3.9, when the sales orders are received for the finished product, the planning material PIRs will be consumed.

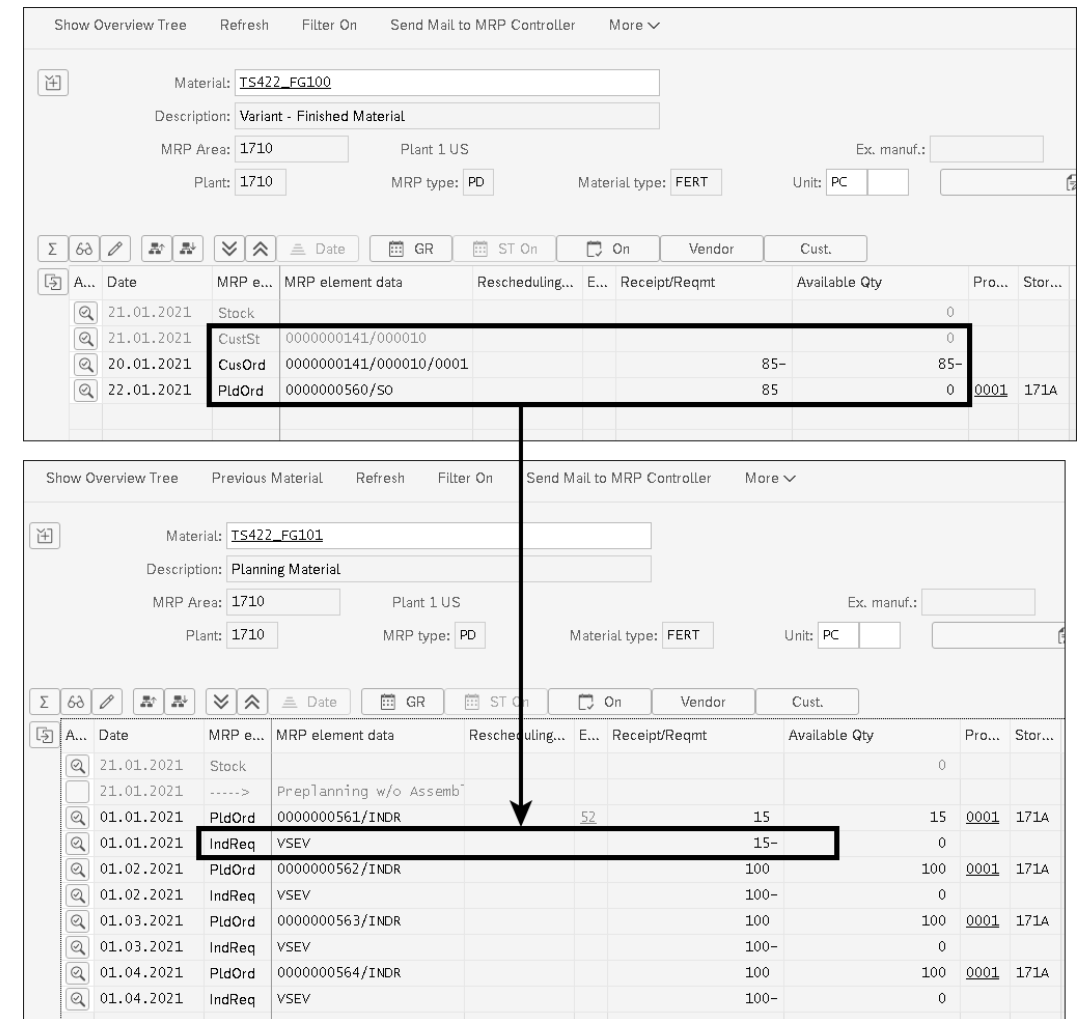


Figure 3.9 Stock Requirements List: Planning with Planning Material

This strategy is like planning strategy 63 (planning with a planning material and without MTO). The only difference is that the planned order type will be MTO in the scenario. It uses the following requirement types:

- For independent requirements: VSEV (planning the planning material)
- For customer requirements: KEVV (individual customer with planning material consumption)

3.6 Planning for Components

The main purpose of planning for components is to produce or procure the components well in advance so that the overall lead time can be reduced or customer requirements can be reacted to quickly.

In SAP S/4HANA, various planning strategies are available for planning for components, planning at the assembly level (strategy 70), planning at the phantom assembly level (strategy 59), and planning without final assembly at the assembly level (strategy 74). Planning at the assembly level is the most commonly and widely used strategy, so we'll focus on that in this section.

All these strategies can be used in MTS and MTO environments. If you want to make use of a strategy for an MTS planning of components in an MTO environment, maintain the **Individual/coll.** indicator (**MRP 4** screen) as **2**.

Planning strategy 70 is one of the most widely used planning strategies for planning for components. This strategy can be used when the component can be more reliably planned than the finished product. Even though this strategy can be used in all manufacturing environments, it's predominantly combined with MTO or ATO environments so that the needed components' availability can be ensured beforehand and customer demand can be quickly reacted to.

The material master setup for this strategy is shown in Figure 3.10. Maintain the material master with planning **Strategy Group** as **70 (Planning with final assembly)** and the **Mixed MRP** field set to **1 Subassembly planning with final assembly**.

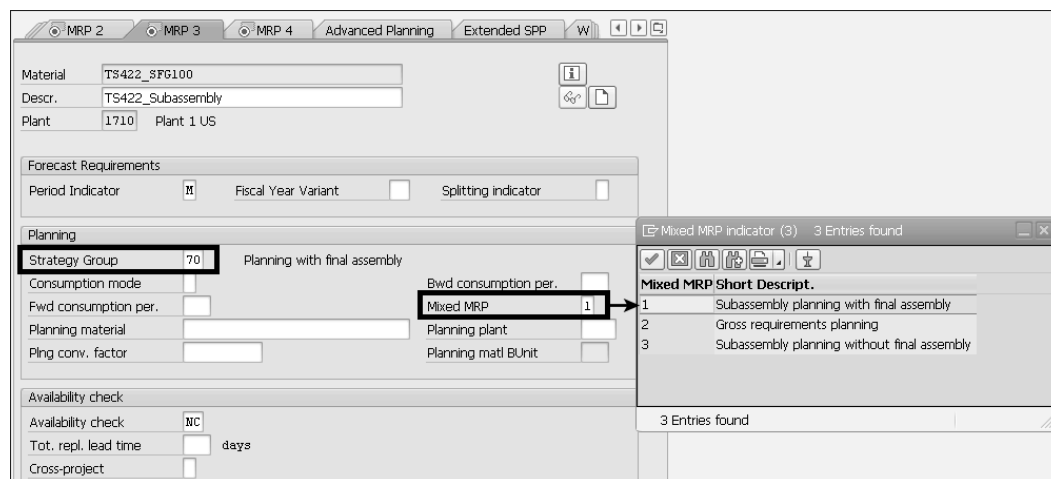


Figure 3.10 Planning at the Assembly Level: Material Master Setup

This strategy is like planning strategy 40 (planning with final assembly). In this strategy, PIRs are created for the components. The dependent requirements or order reservations from the finished products will consume the PIRs of the components.



Tip

This strategy can be used for both semifinished materials and raw materials, which means the material can be produced in-house or procured externally.

3.7 Assemble-to-Order Production

ATO production is a special type of MTO production where the main components are produced or procured well in advance, and the final assembly step will commence only after the receipt of the sales order for finished product. This strategy was pioneered by the computer manufacturing industry and then proliferated into many other industries.

As shown in Figure 3.11, various planning strategies are available for ATO in SAP S/4HANA, but the most widely used planning strategy is assembly processing with production orders (strategy 82).

Strategy	Planning strategy description	Reqs-DM	Reqs-Cu.
<input type="checkbox"/> 81	Assembly processing with planned orders		KMSE
<input type="checkbox"/> 82	Assembly processing w. production orders		KMFA
<input type="checkbox"/> 83	Assembly processing with networks		KMNP
<input type="checkbox"/> 84	Service orders		SERA
<input type="checkbox"/> 85	Assembly processing with network/project		KMPN
<input type="checkbox"/> 86	Filling with process orders "Assembly"		KMPA
<input type="checkbox"/> 89	Assembly proc. w. characteristics plng	VSE	KMSE

Figure 3.11 ATO Planning Strategies (Transaction OPPS)

With planning strategy 82, when a sales order is created, a production order will be created automatically, creating a 1:1 link between sales order and production order. Because of the link, if there is any change in sales order quantities, it will immediately reflect in the production order also.

In the SAP S/4HANA system, production order type PP04 is predefined for assembly with production orders and is assigned in **Reqmts class** (requirements class) **201**, as shown in Figure 3.12.

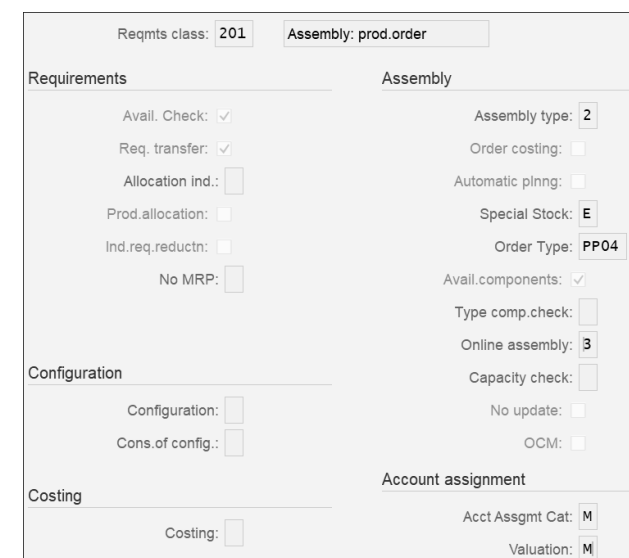


Figure 3.12 Requirements Class 201: For Assembly with Production Order

3.8 Creation of Demand Plan

Forecasting is the first step in the production planning flow. S&OP (available in SAP S/4HANA or SAP IBP) or any other tool is used to create the forecast. The forecast can be fed in the SAP S/4HANA system via demand management, which produces PIRs as output. The PIRs can be created by various means—manually entering the quantities, copying from PIRs of other materials, copying the results of S&OP, and so on—so the precursor activity to MRP is the creation of a demand plan that can span many periods.

The demand plan can be created by using the SAP GUI Transaction MD61. With SAP S/4HANA 1909 on, there is an SAP Fiori app called Maintain PIRs, as shown in Figure 3.13.



Figure 3.13 Maintain PIRs App

This is a simplified app in comparison to SAP GUI Transaction MD61. As shown in Figure 3.14, Maintain PIRs shows various key figures, such as **Accuracy - Current Period**, **Accuracy - Last Week**, **Accuracy - Last Month**, and so on. The accuracy is measured in percentage of PIRs consumed/reduced by an actual demand.

Material	Plant	Reach	Accuracy - Current Period	Accuracy - Last Week	Accuracy - Last Month	Version Active	Last Modified Date
TS422_FG101	Plant 1 US (L710)	3 Months	99999 %	0 %	100 %	Yes	21.01.2021
TS422_SFG100	Plant 1 US (L710)	3 Months	99999 %	0 %	100 %	Yes	21.01.2021

Figure 3.14 Maintain PIRs App: Key Figures

The PIRs can be uploaded or edited with this app. The upload functionality isn't available in SAP ERP. With this app, PIRs of up to 50 materials maximum can be created, monitored, or mass-maintained at a time either in months or weeks for up to 12 months or 52 weeks.

Note

If more than 50 materials are selected in the initial screen, the system displays a dialog box informing that it has limited the selected materials to 50.

Other SAP Fiori apps are also available, including Schedule Copying of Total Forecast Runs, Analyze PIR Quality, and Schedule PIR Reorganization Runs.

Forecasts are rarely accurate, which means many PIRs will still be available that aren't reduced by actual sales orders. It's a best practice to clean out PIRs by executing reorganization runs periodically via scheduled periodic background jobs. With the Schedule PIR Reorganizing Runs app, PIR reorganization runs can be performed as background jobs. This app offers three job templates, as shown in Figure 3.15:

- **PIR Reorganizing - Adjusting Requirements**
The quantities of all the selected PIRs will be matched with requirements. If there is no requirement to consume the PIR, then the PIR quantity will be set to zero.
- **PIR Reorganizing - Delete History and PIRs**
The history and header of the PIR will be deleted (if there are no PIRs).
- **PIR Reorganizing - Delete Old PIR Records**
All the PIRs with zero quantity will be deleted.

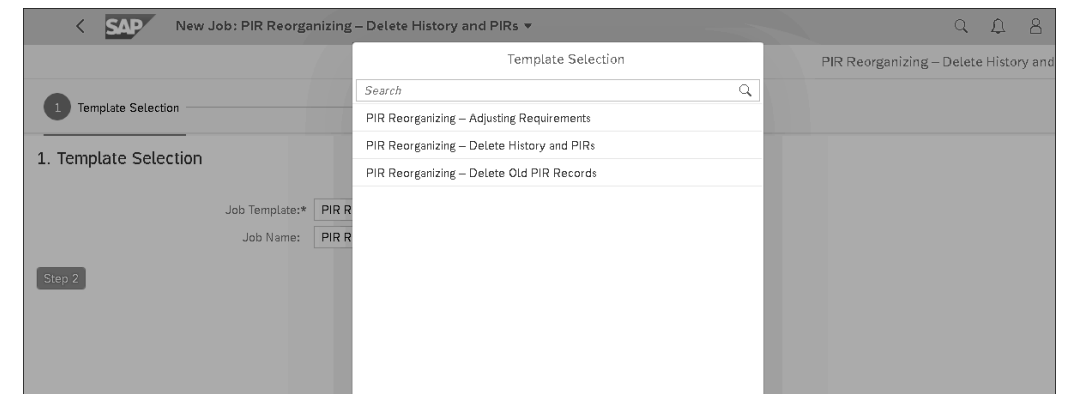


Figure 3.15 PIR Reorganization Run: Job Templates

SAP GUI Transactions MD74, MD75, and MD76 are available for PIR reorganization. SAP Note 135807 provides good generic information on the PIR reorganization.

3.9 Important Terminology

In this chapter, the following terminology was used:

- **Exception message**
Exception messages indicate the exception situations as part of the results of an MRP run.

- **Individual/Coll. indicator**

The requirements quantities of the dependent materials are stated individually or grouped together, or both can be determined with this setting

- **Mixed MRP indicator**

The **Mixed MRP** indicator is used in conjunction with some of the planning strategies and is used only in case of gross requirements planning and subassembly planning:

- Mixed MRP 1: Subassembly planning with final assembly – Planning strategy 70, 59 (Planning at Phantom Assembly Level)
- Mixed MRP 2: Gross requirements planning – Planning strategy 11
- Mixed MRP 3: Subassembly planning without final assembly – Planning strategy 74

- **MRP group**

The **MRP Group** groups material from the MRP point of view to allocate them control parameters for planning. The control parameters include the strategy group, the planning horizon, and the creation indicator for the planning run. For overall planning, the creation indicator parameters maintained in the MRP group will be prioritized over the creation indicator in the overall planning initial screen. **MRP group** is maintained in the **MRP 1** view of the material master.

- **MRP list**

This list shows the static planning situation of a material or group of materials, and the list is generated after completion of the planning run. This is only created for classic MRP.

- **PIR consumption and PIR reduction**

For planning strategy 40 (planning with final assembly), the incoming sales orders consume the PIRs, which is an example of consumption. PIRs are reduced at goods issue for delivery. For planning strategy 10 (net requirements planning), where sales orders don't have any influence, the oldest PIR is reduced first, which is an example of reduction. The consumption settings are maintained in Transaction OMPO (Maintaining Requirements Classes for PIRs). The PIR reduction is maintained in Transaction OMJJ.

- **Planning strategy**

The planning strategy represents a planning procedure for planning a material.

- **Stock requirements list**

This is a dynamic list that shows the current status of requirements of a material.

- **Total replenishment lead time**

The total replenishment lead time is the time needed to have all the BOM components available considering in-house production time and/or planned delivery time of externally procured components of the longest production path.

3.10 Practice Questions

These questions will help you evaluate your understanding of the topics covered in this chapter. They are similar in nature to those on the certification examination. Although none of these questions will be found in the exam itself, they will allow you to review your knowledge of the subject. Select the correct answers, and then check the completeness of your answers in the next section. Remember that, on the exam, you must select all correct answers and only correct answers to receive credit for the question.

1. Which of the following planning strategies are make-to-stock (MTS) strategies? (There are three correct answers.)
 - A. Production by lot size
 - B. Planning with final assembly
 - C. Planning at assembly level
 - D. Planning without final assembly

2. Which indicator in the material master record determines whether a component is procured for a specific sales order stock?
 - A. **Availability check** of the finished product
 - B. **MRP type** of components
 - C. **Individual/coll.** requirement of the component
 - D. **Mixed MRP** indicator of the finished product

3. The production is based on the forecast for finished product, and the stock is expected to be available in inventory before the customer order. You want to quickly react to the customer requirement by increasing the production. Which planning strategy should be selected?
 - A. Planning strategy 50: Planning without final assembly
 - B. Planning strategy 20: Make-to-order production
 - C. Planning strategy 40: Planning with final assembly
 - D. Planning strategy 70: Planning at assembly level

4. A material is planned with planning strategy 70 (planning at assembly level). The consumption mode maintained was backward with a consumption period of 30 days. Starting from when are the 30 days counted backwards? (There are two correct answers.)
 - A. From the scheduled line date in the case of repetitive manufacturing
 - B. From the dependent requirement date of the material

- C. From the sales order requirement date of finished product
 - D. Goods issue date for the production order
5. The **Mixed MRP** indicator is used in conjunction with which of the planning strategies? (There are two correct answers.)
- A. Net requirements planning
 - B. Gross requirements planning
 - C. MTO planning
 - D. Subassembly planning strategies
6. The stock/requirements list for a material using which MTS strategy shows the special stock segment?
- A. Net requirements planning: Strategy 10
 - B. Gross requirements planning: Strategy 11
 - C. Production by lot size: Strategy 30
 - D. Planning without final assembly and without MTO: Strategy 52
7. With reference to MTO planning strategies, which of the following statements are correct?
- A. MTO strategies should always be combined with lot-size key EX (lot-for-lot).
 - B. Rounding values should not be used.
 - C. Only answer A is correct.
 - D. Both A and B are correct.
8. True or False: In anonymous MTS production, the oldest planned independent requirement (PIR) is reduced first.
- A. True
 - B. False
9. For planning strategy 40 (planning with final assembly), if you don't maintain the consumption parameters, what happens to the PIRs? (There are two correct answers.)
- A. The customer requirements won't consume PIRs.
 - B. The customer requirements will consume the PIRs first in the past and then switch to future.
 - C. If no consumption parameters are maintained, the system will check the consumption parameters in the MRP group assigned to the material.
 - D. If no consumption parameters are maintained, then the default setting is backwards consumption for 999 days.

10. A configurable material is a material for which different variants are possible. Identify all the planning strategies for configurable materials. (There are multiple correct answers.)
- A. Planning variants with a planning material (Strategy 65)
 - B. MTO production with configuration (Strategy 25)
 - C. Planning variants without final assembly (Strategy 55)
 - D. MTO production for material variants (Strategy 26)
11. In the stock requirements list, planned orders created within the **Preplanning** segment have a special type VP. Which planning strategies are associated with this special planned order type VP? (There are multiple correct answers.)
- A. Planning without final assembly (Strategy 50)
 - B. Planning without Final Assembly and without MTO (Strategy 52)
 - C. Planning with a planning material (Strategy 60)
 - D. Planning with a planning material and without MTO (Strategy 63)
12. True or False: PIR reorganization will clear all the PIRs.
- A. True
 - B. False

3.11 Practice Answers and Explanations

1. Correct answers: **A, B, and C**
Option D, planning without final assembly (50) is an MTO strategy. The remaining strategies are MTS strategies
2. Correct answer: **C**
The **Individual/coll.** indicator in the **MRP 4** view controls how the dependent requirements are managed in individual segments specific to a sales order produced/procured collectively or planned in the same way as in the higher-level assembly.
3. Correct answer: **C**
These are the characteristics of planning strategy 40 (planning with final assembly). As indicated in the question, the production is based on a forecast of the finished product, so answers A, C, and D are incorrect.
4. Correct answers: **A and B**
For planning strategy 70 (planning at assembly level), PIRs are consumed by production order or planned order requirements or schedule lines in repetitive manufacturing and not by requirements of sales orders.

5. Correct answers: **B and D**

The **Mixed MRP** indicator is only used for subassembly planning strategies such as planning strategy 11 (gross requirements planning), 59 (planning at phantom assembly level), 70 (planning at assembly level), and 74 (planning without final assembly at assembly level).

6. Correct answer: **B**

Strategy 11 (gross requirements planning) is the only MTS planning strategy that will have a special segment in the stock/requirements list, which is used for planning purposes only. If the **Mixed MRP** indicator in the **MRP 3** view isn't maintained, then it won't be possible to maintain PIRs in Transaction MD61, as the requirements type BSF needs this indicator to be maintained.

7. Correct answer: **D**

The master data to be maintained for all the MTO strategies discussed in the question relates to MTO production (strategy 20), planning without final assembly (strategy 50), and planning with planning material (strategy 60). The lot-size key maintained should always be EX (lot-for-lot), and rounding values should not be used. Even if you maintain other lot-size keys or rounding values, these values don't take effect in MTO strategies.

8. Correct answer: **A**

In anonymous MTS production, the oldest (first in, first out [FIFO]) PIR is reduced first. If there are no PIRs left in the past, then the PIRs in the future will also get reduced, if reduction is permitted. The settings for reduction are maintained in Transaction OMJJ. During assembly planning, the PIRs are reduced when goods are issued for the production order.

9. Correct answers: **C and D**

If you don't maintain a consumption mode in the material master, the system uses the consumption parameters from the MRP group that is assigned to the material. If a consumption mode isn't specified in the MRP group also, the **Consumption mode** is set to 1 by default (backward consumption only) with a (backward) consumption period of 999 days.

10. Correct answers: **A, B, C, and D**

All the given options are correct for planning strategies for configurable materials. With these strategies, it's possible to plan almost an unlimited number of combinations of characteristics and combination value keys.

11. Correct answers: **A, B, C, and D**

All the options given are correct. In the stock requirements list, planned orders created within the **Preplanning** segment have a special type VP. They are created so that the BOM can be exploded, and dependent requirements can be passed to the components. These planned orders with order type VP aren't convertible or manually changeable, and they will be used only to pass the demand to the components.

12. Correct answer: **B**

It's a best practice to periodically run PIR reorganization to clear out old PIRs that weren't reduced by actual sales orders. PIR reorganization is executed in three different steps with these transactions and programs: Transaction MD74 (program RM6ORR20), Transaction MD75 (program RM6ORR30), and Transaction MD76 (program RM6ORR40). In SAP S/4HANA, for this purpose, there is also an SAP Fiori app called PIR Reorganization Run.

3.12 Test Takeaway

You've gained good knowledge in this chapter about demand management and demand planning, different production types, and associated planning strategies, including how the requirement types for PIRs and customer requirements interact and together form the basis for planning strategy customization. Although it's possible to create new planning strategies, care should be taken and existing options should be evaluated first. With decades of experience, SAP has already incorporated many planning strategies out of the box in SAP S/4HANA, considering most of the business scenarios in view. Managing PIRs in SAP Fiori apps and reorganizing them is an important activity. SAP has listened to the industry and provided the ability to upload PIRs with SAP Fiori apps.

As you start gaining experience with various planning strategies, by looking into stock/requirements of a material, you can quickly identify what kind of planning situation a material is undergoing and if there are any issues you can quickly troubleshoot.

You should be familiar with and have a good understanding of the material master fields that are important for demand management. Consider this chapter as the heart of production planning and manufacturing. A support or implementation consultant with thorough knowledge of the concepts discussed in this chapter will provide a good value to SAP S/4HANA implementation projects.

3.13 Summary

Demand management is the fundamental building block required for effective implementation of the SAP S/4HANA solution in a customer environment. By now, you must have internalized different production types and associated planning strategies and how the standard SAP S/4HANA system supports many business scenarios.

In the next chapter, we'll discuss MRP in detail, including the major improvements and innovations implemented in SAP S/4HANA.

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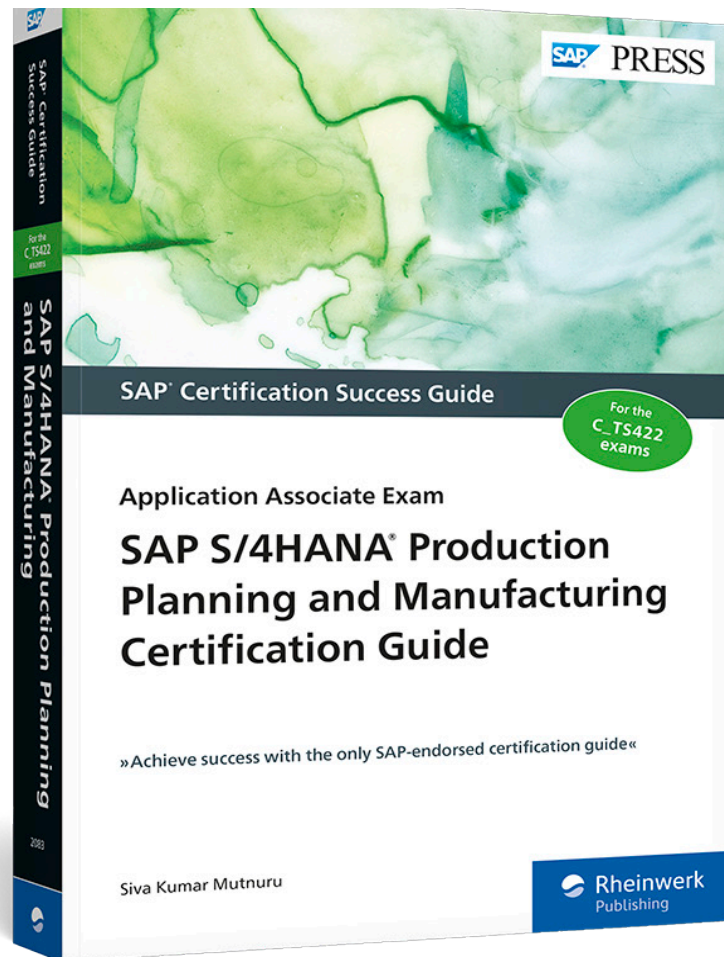
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