

Browse the Book

In this chapter, you'll learn about quality management in SAP S/4HANA. You'll explore key features and functionalities for quality planning, quality inspection, and quality improvement. You'll also discover SAP Fiori apps for quality management reporting.

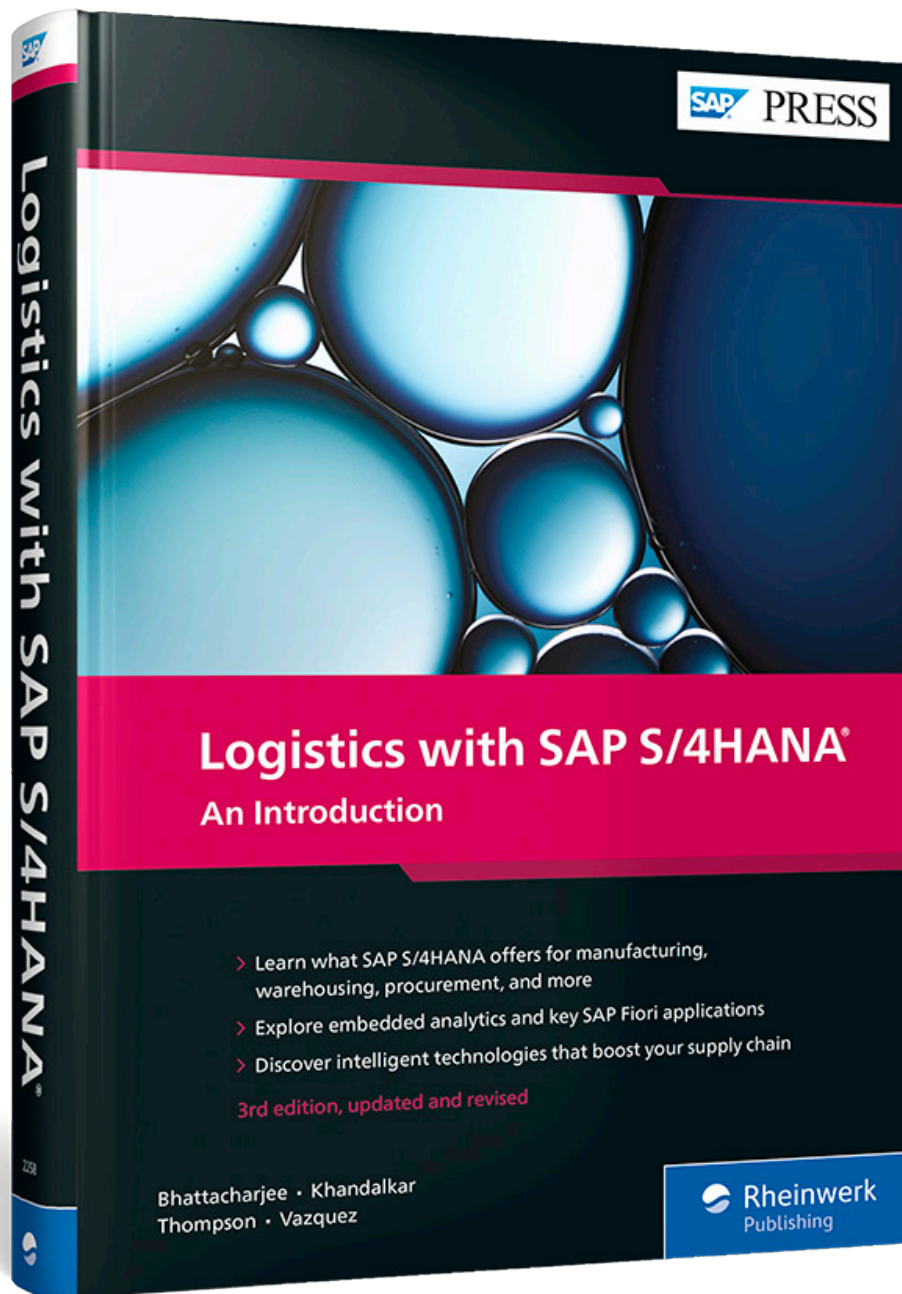
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Chapter 5

Quality Management

From the planning and implementation stages of a product's lifecycle to its marketing and use, quality management plays a part in all processes in the logistics supply chain. Detecting errors and performing corrective tasks early minimizes the effects of these errors on a product's cost and quality.

To stay competitive in today's business environment, organizations have to not only acquire new customers but also meet the expectations of their existing customer base.

Meeting predefined standards of quality is the first step. Strict adherence to quality norms for goods manufactured or services performed helps an organization track its revenue leakages and areas of potential improvement. It is imperative for companies in the manufacturing industry to implement suitable quality procedures for incoming goods to their facility and goods produced in-house before they are supplied to the customer.

The individual quality management functions are active throughout a company's logistics supply chain. Those functions include triggering process inspections upon the receipt of goods during production or during the goods issue process, checking test equipment, processing samples in the process industry, recording and processing problems in day-to-day activities with the help of quality notifications, creating certificates to verify product quality from procurement to the sales and distribution stage, recording quality-related costs during procurement, production, and sales, and many more. In a nutshell, different departments in a company process a product throughout its lifecycle. Integration of quality management processes and the exchange of information between individual areas within the company form the basis for achieving customer satisfaction.

The objective of this chapter is to showcase the functionalities and benefits that come with SAP S/4HANA for quality management. We begin in Section 5.1 by explaining key concepts around quality management, which are subdivided into three main specialties: procurement, production, and sales and distribution. In Section 5.2, we start taking a closer look at the SAP S/4HANA system, focusing on key master data simplifications in the new system that impact quality management. The bulk of the chapter explores key features and functionality around quality planning (Section 5.3), quality inspection

(Section 5.4), and quality improvement (Section 5.5). Section 5.6 highlights critical reports that are available in SAP S/4HANA for quality management.

5.1 Quality Management Basics

SAP S/4HANA quality management is deeply integrated with other key areas, such as SAP S/4HANA planning for activities like work planning and procurement planning; SAP S/4HANA procurement for activities like the release of suppliers, goods receipt inspections, and complaints against suppliers; SAP S/4HANA production for activities like inspections and production checks; and SAP S/4HANA sales for activities like customer-specific inspection requests, goods issue inspections, and customer complaints. Quality management is an embedded system within SAP S/4HANA; as a result, it can access general cross-application functions and support functions within the system. For example, it can access basic functions like SAP business workflow as well as supporting functions like the engineering change management (documents, drawings, inspection plans), document management (technical delivery terms, quality assurance agreements), and classification systems (batches, class characteristics).

As we can see in Figure 5.1, quality management influences demand, production, and purchase decisions from the moment the customer places the sale order to the moment the product is delivered:

- **Sales**
Creation of customer-specific inspection specifications
- **Material requirements planning (MRP)**
Availability of products, resources, and tools
- **Production**
Inspections during production
- **Materials management**
Goods receipt inspections, vendor evaluations, and inspection stock
- **Storage**
Inspection of stock transfers and stock monitoring
- **Shipping**
Inspection for delivery

An inspection lot can be triggered at different stages in the logistics supply chain. This leads to the creation of an inspection lot.

Triggers for an inspection lot include the following:

- Goods movement (goods receipt, stock transfer, goods issue)
- Orders (production orders, maintenance orders)
- Source inspections

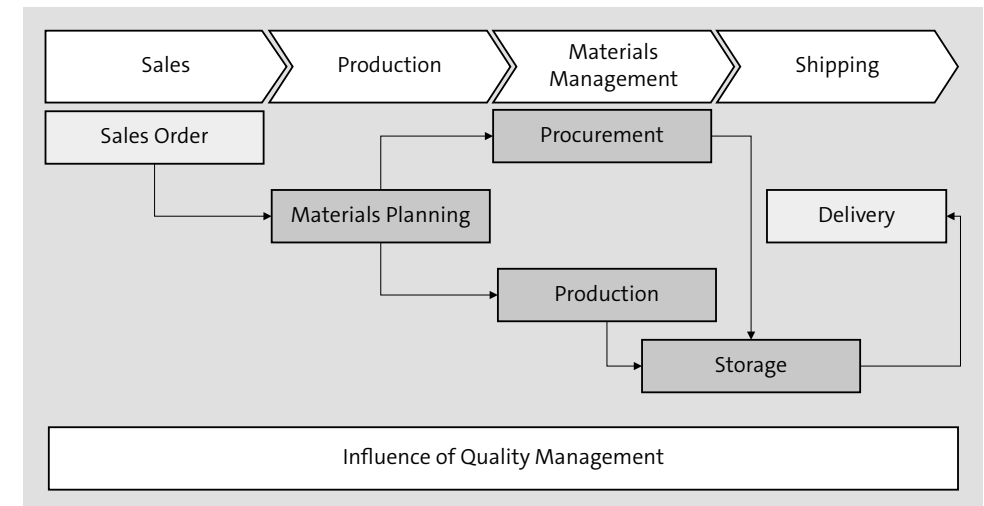


Figure 5.1 Quality Management in Logistics/Supply Chain

The inspection lot forms the basis of inspection processing. It contains all the information for the inspection, such as order, material, inspection lot size, inspection specifications, and quantity to be inspected, if required. Afterward, the inspection results are recorded for the inspection lot.

The usage decision specifies whether the goods are accepted or rejected based on the results of the inspections.

In addition to the standard processes, event-controlled processes in the supply chain are triggered when problems occur. The recording, analysis, and documentation of these problems can be controlled via quality notifications and forwarded to respective departments for further processing.

5.1.1 Quality Management in Procurement

Quality management is intertwined with the procurement functions of an organization with the following objects:

- Material
- Material and supplier
- Supplier and manufacturer

The technical delivery terms for a material are stored in the document management system (DMS) and can be included in a request for quotation (RFQ) sent to a supplier. These terms are assigned to the material master via the additional data in the material master record.

Information related to quality management in procurement is stored in the quality management view of the material master and in the quality info record for procurement. The SAP Fiori app Manage Quality Info Record allows you to display, create, edit, and manage quality information records, as shown in Figure 5.2.

The screenshot displays the SAP Fiori app 'Manage Quality Info Record' for material ZCH_30005. The interface is divided into several sections:

- Release:** Release Until: 31.12.2023; Release Quantity: 1,000,000 KG; Ordered Quantity: 0,000 KG.
- Description:** Detailed Description and Inspection Control sections.
- Inspection Control:** Actual QM System: ISO 9003, without cert., audit note >=80 (3080); QM System Valid To: -; Supplier System: -; Supplier System Valid To: -; Inspection Control: Inspection Active Regardless of Supplier Certification (1).
- Production Part Approval:** PPAP Level: No Warranty; PPAP Status: -; Enable button.

Figure 5.2 Manage Quality Info Record App

You can store the following pieces of quality control-based information for the supplier or manufacturer and the material in the quality info record:

- Release periods
- Release quantity
- Release status
- Blocking information
- Quality assurance agreement

You can also indicate whether the goods receipt inspection was deactivated or whether the goods receipt inspection or source inspection was performed.

In addition to the goods receipt inspection, we can also have the goods inspected at the suppliers' premises and released for delivery, as shown in Figure 5.3. The goods receipt

inspection or source inspection is triggered after a purchase order is issued and the delivery date is determined for the goods.

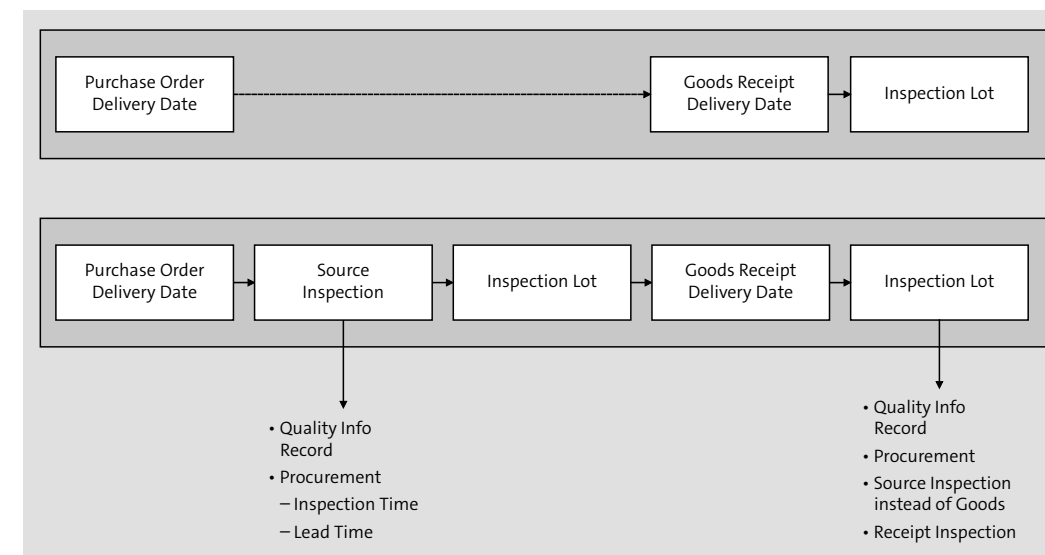


Figure 5.3 Source Inspection

5.1.2 Quality Management in Production

In production, quality management provides you with important information about the current quality of the manufactured goods and enables you to use quality notifications to implement corrective actions.

The inspection planning function is integrated in the production planning functions. Inspections during production are controlled using the inspection operations that are contained in the routing or the master recipe through the inspection specifications, which allows you to record information relevant to quality management. In the task list operation, the control key defines whether inspection characteristics are to be used.

When a production order is released, the system creates an inspection lot with the corresponding inspection specifications, like sample size, inspection frequency, and inspection characteristics. A quality notification for a production order can be created from the operation confirmation via the Confirm Production Operation app. Figure 5.4 shows how you can add a material in the Confirm Production Operation app by inputting the material number, plant, storage location, and quantity information. After adding the basic material information, you can enter and confirm the production operation information in the **Quantities**, **Material Movements**, and **Activities** tabs on the details screen, shown in Figure 5.5.

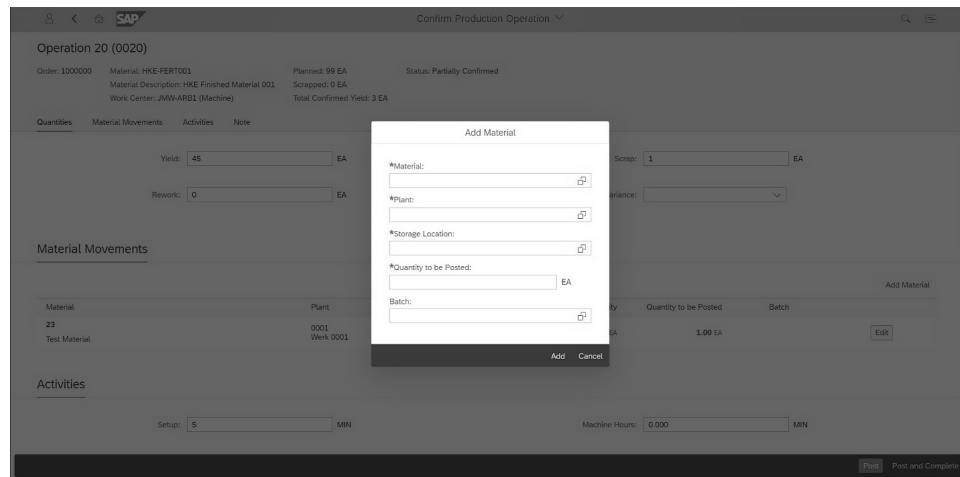


Figure 5.4 Add Material Details in the Confirm Production Operation App

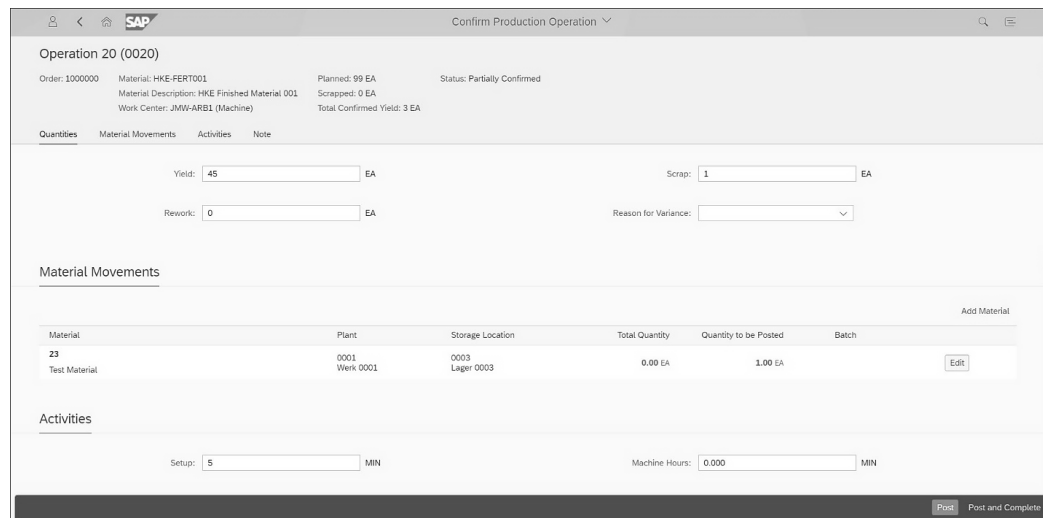


Figure 5.5 Review and Confirm the Production Operation

When a production or process order is released, an early goods receipt inspection lot (inspection lot origin O4) can be generated for this order, as shown in Figure 5.6. This inspection lot is created independently of whether an inspection lot with origin O3 exists for the relevant order. The early goods receipt inspection lot represents a combination of inspection lots. One inspection lot is created for each combination of order, batch, and storage location. Once the goods have been received, the inspection lot becomes stock relevant and can be used to manage stock.

There are advantages and limitations for the early goods receipt inspection lot. Its advantages include the following:

- Creation of the inspection lot when the order is released
- Independent inspection plan
- Automatic assignment of batch number upon goods receipt
- Early stage of inspection

Its limitations include the following:

- Only one inspection lot for each order
- Only one batch and storage location
- No direct link between inspection lot and original production order

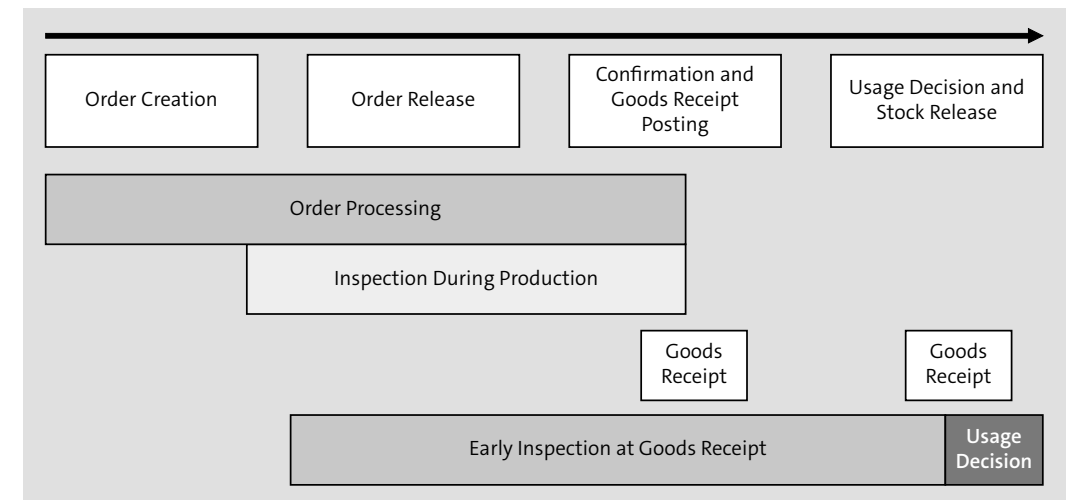


Figure 5.6 Early Inspection at Goods Receipt

5.1.3 Quality Management in Sales and Distribution and Service

The quality management component can also control inspection processing for goods issues. When the goods are shipped, the quality management component supplies the quality certificates to accompany delivery. It also enables you to process customer complaints effectively using quality notifications.

The Quality Info Record Sales app, shown in Figure 5.7, can be used to define inspection-relevant specifications for customers created as business partners. These specifications apply to all materials that are delivered to the customer and include control parameters of quality inspection, delivery category, and documents.

Using the Quality Info Record Sales app, you can do the following:

- Specify the material for material-specific inspection processes.
- Define customer specifications.
- Enter additional short or long text.

Quality Info Record In Procurement

TEST124 TEST124

Plant: Plant 0001 (0001) Supplier: Test1234 (100889) Revision Level:

GENERAL INSPECTION CONTROL STATUS QUALITY AGREEMENT ADMINISTRATIVE DATA

General

Release Until: 31.07.2017

Release Quantity: 0.000 EA

Ordered Quantity: 0.000 EA

Reset On: 31.07.2016

Long Text

Long Text:

Inspection Control

Certification

Actual QM System:

QM System Valid To:

Supplier System:

Supplier System Valid To:

Inspection Control:
Inspection Active If Supplier Not Certified

Release Quantity

Release Quantity Is Active: No

Release Quantity: 0.000 EA

Ordered Quantity: 0.000 EA

Reset On: 31.07.2016

Block

Block Function:

Block Reason:

Supplier Block:

Supplier Source Inspection

Source Inspection:

Lead Time (in Days): 0

Source Inspection Instead of GR Inspectn: No

Certificate Control

Certificate: Standard certificate receipt (print, PDF, or FAX)

Figure 5.7 Quality Info Record Sales App

When creating the delivery, the Quality Info Record Sales app helps you decide where the checks for the goods to be delivered are carried out. If an outbound delivery for a product or material is created, and if the delivery item is inspection relevant (determined by corresponding parameters in sales processes) an inspection lot is automatically generated. The inspection results of the delivery are printed on quality certificates and included with the delivery (or are directly sent to the customer).

Quality notifications can be used by the service department to process return deliveries. The problem is recorded in a quality notification for a customer complaint (notification origin Q1), and follow-on functions such as the following can be carried out:

- Create a repair order.
- Post a goods movement to the appropriate stock for the return item to be processed accordingly, like sales order stock, unrestricted use stock, or scrap.
- Execute a technical inspection.
- Confirm the result of the technical check to the repair order and complete the notification.

Depending on the technical inspection, either goods can be returned to the customer or, if scrapped, replacement parts can be sent to the customer using standard sales processes.

Returns from customers can also be processed by creating an inspection lot to perform a quality inspection to determine whether the goods can be repaired.

5.2 Master Data Simplifications

Now that we've established the basics, we want to turn our attention to SAP S/4HANA and the simplifications to master data introduced in this system compared to its effective predecessor, SAP Business Suite.

Considering the master data specific to quality management, SAP has introduced no major changes. However, master data used in conjunction with quality management and other processes has undergone some significant changes.

For example, the material master is used by several logistics applications and serves as an important integrating element. In quality management, the material master controls procurement by referencing quality documents, such as the technical delivery terms, and stipulates whether a certificate must be included in the delivery. The material master can also govern how, when, and where a quality inspection will be carried out. The inspection can occur with or without an inspection plan and can also have a record of characteristics depending on the requirement.

The key change for the material master that impacts quality management is that SAP S/4HANA now allows companies to determine the material master character length. This is a configurable value that defaults to 18 characters but can be extended up to 40 characters. (Note that this is a master data simplification that also impacts manufacturing; return to Chapter 4 for more details.)

Now that we've discussed master data changes, let's look at the core quality management processes in SAP S/4HANA.

5.3 Quality Planning

In quality planning, we define long-term information and processes as master records. Quality planning provides the basis for inspection processing. The following data is used for quality planning:

- Logistics master data
- Inspection planning data (such as master recipes, inspection plans, and material specifications)
- Quality management-specific basic data (such as master inspection characteristics (MICs), inspection methods, and sampling procedures)

We take a closer look at master data and the inspection planning process in the following sections.

5.3.1 Logistics Master Data

General logistics master data includes cross-application data and data specific to quality management.

Cross-application data is maintained in most cases in other components of the SAP system. Cross-application data used in inspection planning includes the material master, business partner, batch classification, and quality document.

Quality management data used in inspection planning includes the quality info record for procurement, quality info record for sales, material specifications, and inspection plans.

5.3.2 Inspection Planning

In inspection planning, material-related information is used when the material is inspected. Inspection plans are defined to describe how a quality inspection is processed for one or more materials. Users can also determine the inspection operations, the inspection characteristics to be checked for each inspection operation, and the test equipment to be used. It also determines which quality parameters and item characteristics need to be inspected in each operation in several key points in the supply chain and how they need to be inspected. It helps manage quality information for materials, vendors, manufacturers, and customers, and it monitors vendors' and manufacturers' quality systems.

In Figure 5.8, the inspection plan **CAR/WL** is created with material **0001-100-WHEEL** assigned to it, along with plant, supplier, and customer details.

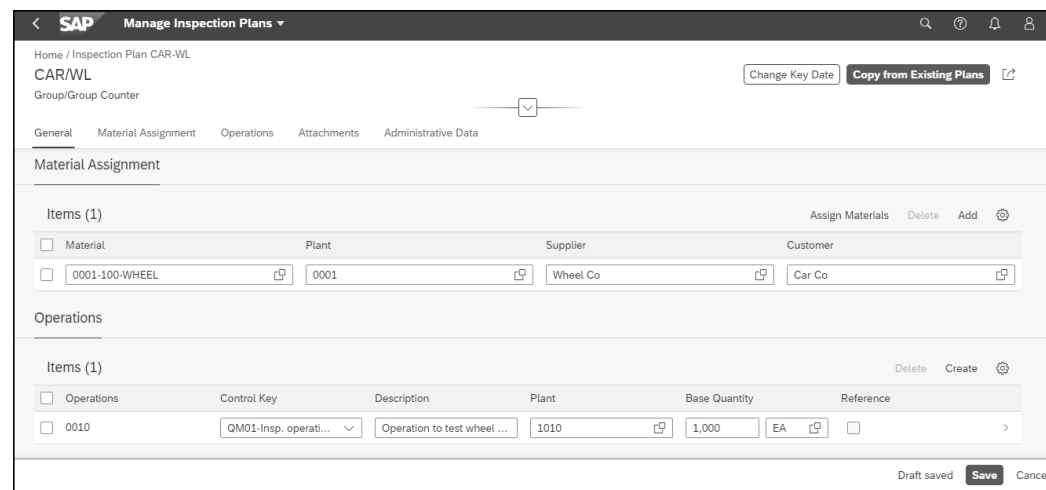


Figure 5.8 Manage Inspection Plans App

For the same inspection plan, you can assign inspection characteristics and MICs, as shown in Figure 5.9.

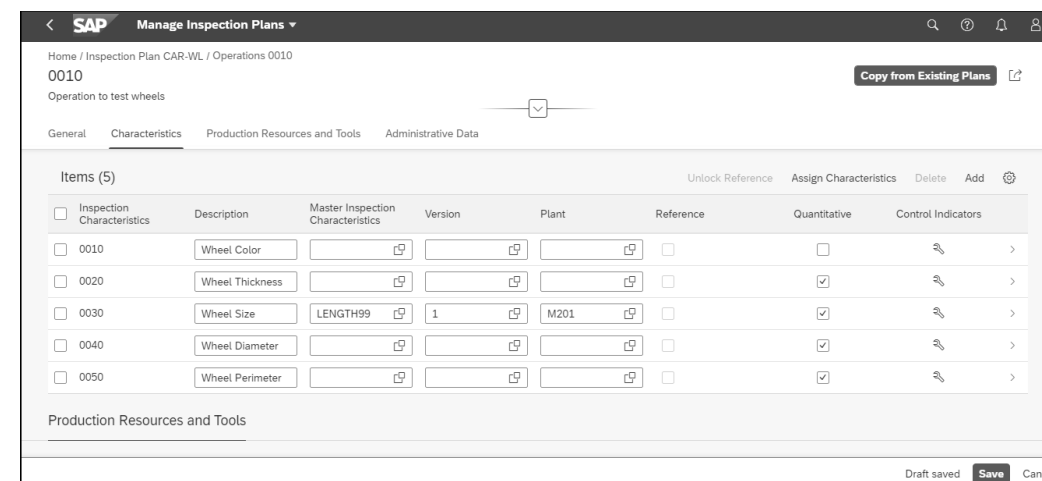


Figure 5.9 Characteristics for the Inspection Plan

5.4 Quality Inspection

Quality inspection is required whenever the goods that are currently being produced or those that were recently produced need to be checked for adherence to the standards set by the organization's quality policy.

SAP S/4HANA provides various functionalities to initiate a quality inspection and take it through the complete process of quality checks to decide whether to accept the stock by posting goods receipts or to reject it and move it to the blocked stock for corrective actions. Multiple SAP Fiori apps enable you to perform the quality inspection process with ease, and new extensibility in SAP Fiori allows you to add new features to the standard SAP Fiori apps as needed.

In production planning, production orders are created for the material and are released. Quality management controls in production planning trigger the creation of an inspection lot according to the sampling procedure defined by the system; the inspection lot is then used to record results and usage decisions per the defined MICs. Any nonconformance in the quality parameters results in the creation of quality notifications to analyze the quality gaps in the defective items and to record the corrective activities required to repair the items. The inspection lot also records the names of the personnel involved with the defect. Quality notification types are configured to distinguish between complaints against vendors and the company's internal quality issues observed during the in-process inspection. Notifications are then converted into work orders to capture the activities performed and the associated costs, which are then processed.

We discuss inspection lots and key functionality around executing quality inspections in the following sections.

5.4.1 Inspection Lots

The creation of an inspection lot can be triggered by any goods production, sale, or goods movement; for example, on the release of a production order, an inspection lot is automatically created.

In SAP S/4HANA, an inspection lot can also be created manually as required by the business through an SAP Fiori app called Inspection Lot, as shown in Figure 5.10. The manually created inspection lot is then processed further to record the results and help relevant parties make usage decisions.

In this app, you can view the inspection operations and the characteristics assigned to them and then record the results against each characteristic. The progress of each characteristic is indicated by color-coding: red signifies results that are outside the tolerance limits, green signifies results that are within the acceptable limits, and gray signifies results that have not yet been recorded. After the results are recorded, you can make the decision to accept or reject usage by clicking on the **Usage Decision** tab on the same screen.

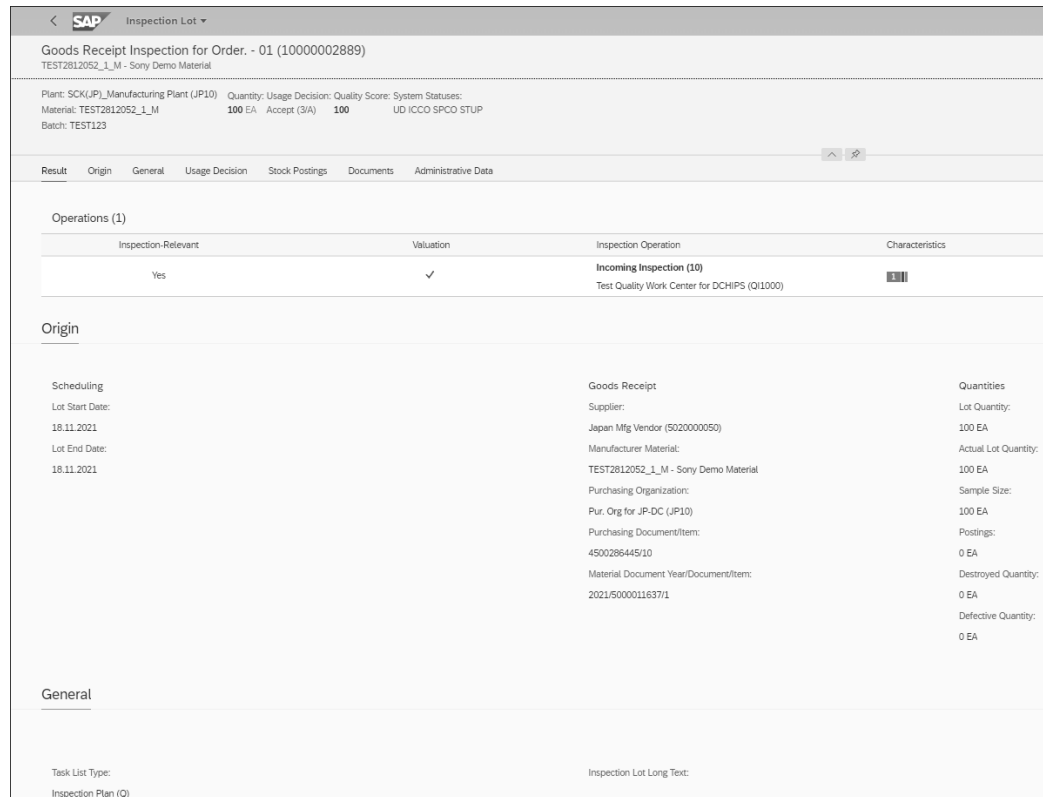


Figure 5.10 Inspection Lot App

5.4.2 Executing Quality Inspection and Inspection Lot Completion

In this section, we explore the key SAP Fiori apps used for quality inspection execution. We also discuss apps relevant for inspection lot completion.

Inspection Method

Inspection methods describe how to carry out an inspection for an inspection characteristic. They're created at the plant level and are assigned to MICs or inspection plans to describe the inspection procedure.

You can create inspection methods through an SAP Fiori app called Inspection Method. By creating them at the plant level, quality managers can standardize the inspection planning activities. Figure 5.11 shows the inspection method details for an MIC **Color Check**, which is assigned to the inspection lot of material **Cola**. The inspection method in this figure specifies that the color check will be performed after every goods receipt from the factory and will have single results. It also shows the status of the MIC and that the MIC is qualitative.

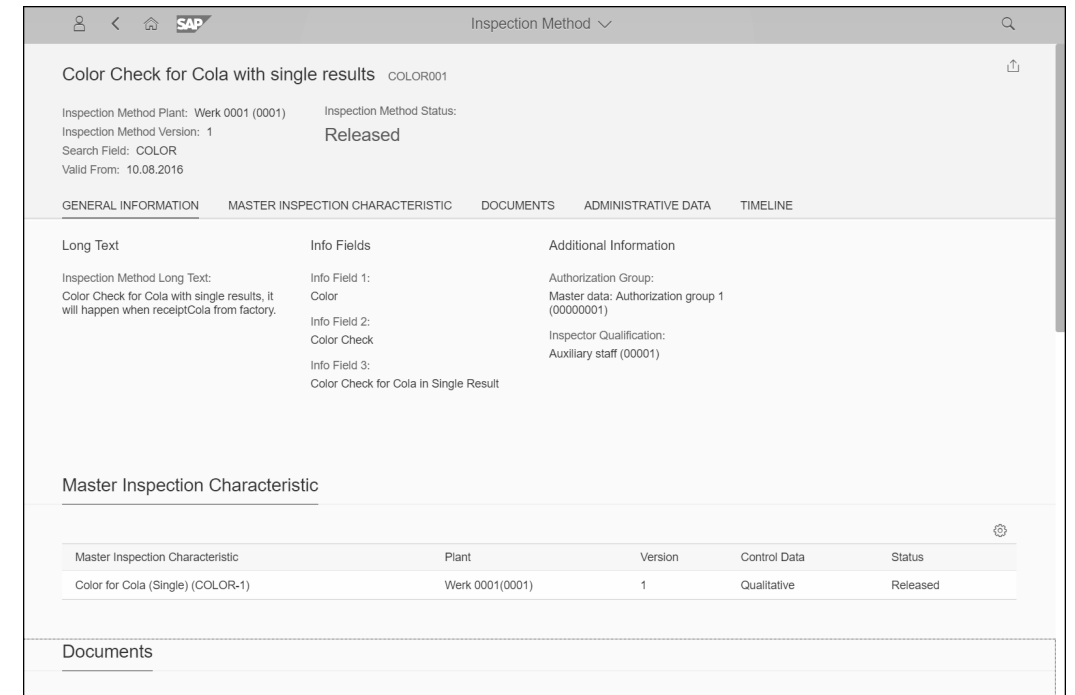


Figure 5.11 Inspection Method App

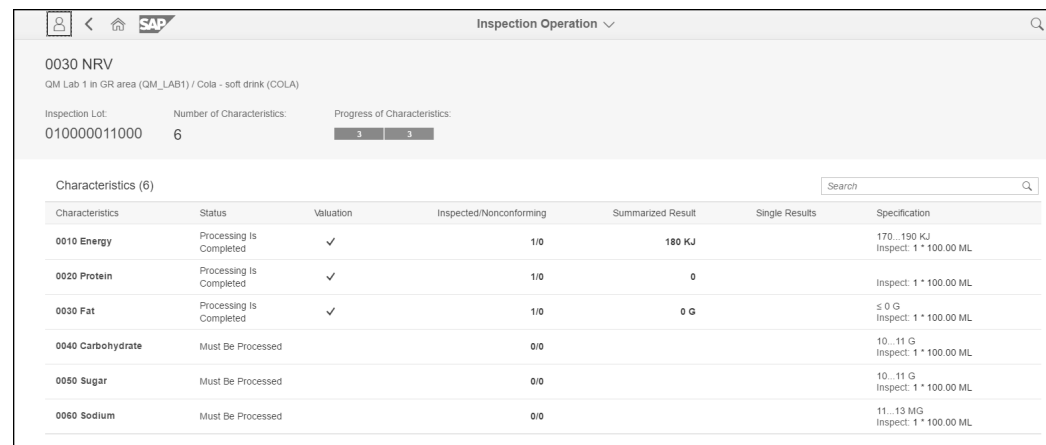
If any problems are identified during the inspection, you can record the defects and, if necessary, activate a quality notification to process these problems. Results can be recorded for quality inspection characteristics with a yes/no or on the basis of attribute codes that implicitly contain a valuation. The results are updated in the statistics and

can be used for quality control purposes. Results can be directly recorded for inspection lots, or you can select the relevant lot from a worklist.

Inspection Operation

Inspection operations define the set of activities related to the inspection lot. Using the SAP Fiori app Inspection Operation, you can create and view the characteristics against the inspection operations. The app also displays details of the results and the valuation of the characteristics maintained against each inspection operation.

For example, in Figure 5.12, inspection operation **0030 NRV** for inspection lot **010000011000** has **6** characteristics. This app enables you to view the processing status of the characteristics for the selected operation; here, processing is complete for three characteristics (**Energy, Protein, and Fat**) without any nonconformity, and the rest (**Carbohydrate, Sugar, and Sodium**) are yet to be inspected.



Characteristics	Status	Valuation	Inspected/Nonconforming	Summarized Result	Single Results	Specification
0010 Energy	Processing Is Completed	✓	1/0	180 KJ		170...190 KJ Inspect: 1 * 100.00 ML
0020 Protein	Processing Is Completed	✓	1/0	0		Inspect: 1 * 100.00 ML
0030 Fat	Processing Is Completed	✓	1/0	0 G		≤ 0 G Inspect: 1 * 100.00 ML
0040 Carbohydrate	Must Be Processed		0/0			10...11 G Inspect: 1 * 100.00 ML
0050 Sugar	Must Be Processed		0/0			10...11 G Inspect: 1 * 100.00 ML
0060 Sodium	Must Be Processed		0/0			11...13 MG Inspect: 1 * 100.00 ML

Figure 5.12 Inspection Operation App

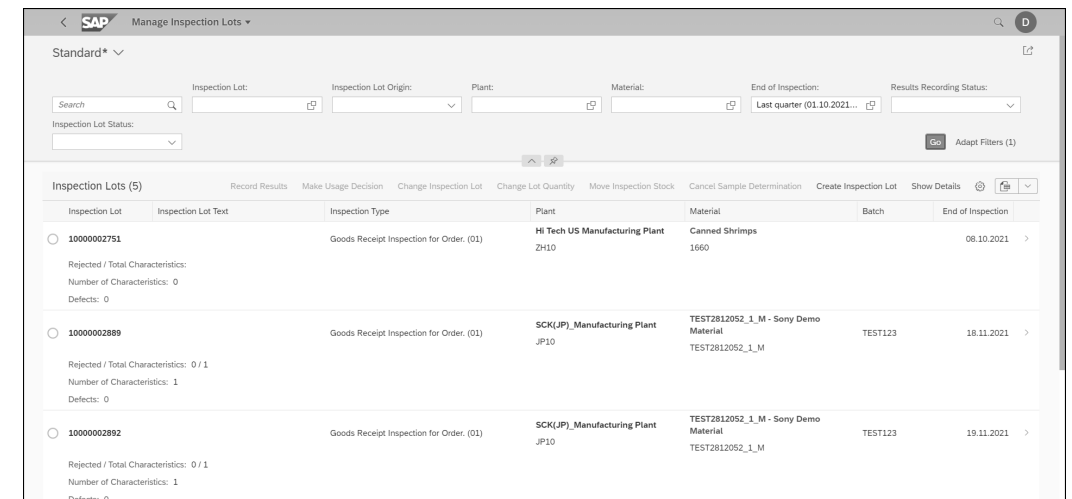
The principle of dual control can be used in recording the results to ensure that results in SAP S/4HANA are recorded by different users. This means that at least two different people have to be involved in recording inspection results.

Manage Inspection Lots

An SAP Fiori app called Manage Inspection Lots allows you to view and process the inspection lots on one screen, as shown in Figure 5.13. Filtering criteria, such as **Inspection Lot Origin, Inspection Lot Number, and Results Recording Status** can be used to display a list of inspection lots. You can select and change inspection lot details, such as lot quantity and cancel sample determination, and make usage decisions. You also can create a new inspection lot, select an existing lot, and perform subsequent actions, such as the following:

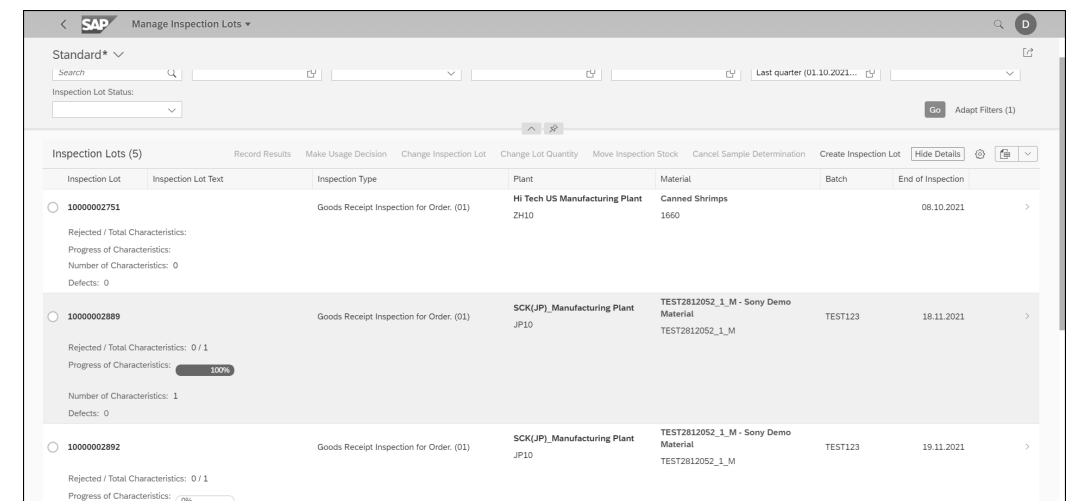
- Change inspection lot
- Change lot quantity
- Move inspection stock
- Cancel sample determination

By clicking on **Show Details**, you can see the progress made on recording inspection results against characteristics, as shown in Figure 5.14.



Inspection Lot	Inspection Lot Text	Inspection Type	Plant	Material	Batch	End of Inspection
10000002751		Goods Receipt Inspection for Order. (01)	HI Tech US Manufacturing Plant ZH10	Canned Shrimps 1660		08.10.2021
10000002889		Goods Receipt Inspection for Order. (01)	SCK(JP)_Manufacturing Plant JP10	TEST2812052_1_M - Sony Demo Material TEST2812052_1_M	TEST123	18.11.2021
10000002892		Goods Receipt Inspection for Order. (01)	SCK(JP)_Manufacturing Plant JP10	TEST2812052_1_M - Sony Demo Material TEST2812052_1_M	TEST123	19.11.2021

Figure 5.13 Manage Inspection Lots App



Inspection Lot	Inspection Lot Text	Inspection Type	Plant	Material	Batch	End of Inspection
10000002751		Goods Receipt Inspection for Order. (01)	HI Tech US Manufacturing Plant ZH10	Canned Shrimps 1660		08.10.2021
10000002889		Goods Receipt Inspection for Order. (01)	SCK(JP)_Manufacturing Plant JP10	TEST2812052_1_M - Sony Demo Material TEST2812052_1_M	TEST123	18.11.2021
10000002892		Goods Receipt Inspection for Order. (01)	SCK(JP)_Manufacturing Plant JP10	TEST2812052_1_M - Sony Demo Material TEST2812052_1_M	TEST123	19.11.2021

Figure 5.14 Progress of Characteristics Feature in the Manage Inspection Lots App

Record Inspection Results

The SAP Fiori app called Record Inspection Results enables you to select multiple inspection lots at the same time and record results centrally. This can save a lot of time and effort. Defects can be created for the inspection lot, inspection characteristic, or inspection operation, as shown in Figure 5.15, which can be viewed in the Process Defects and Manage Defects apps.

In Figure 5.16, for creating a defect for inspection characteristic 8000, you can record the nature of the defect by Defect Code and Defect Code Group.

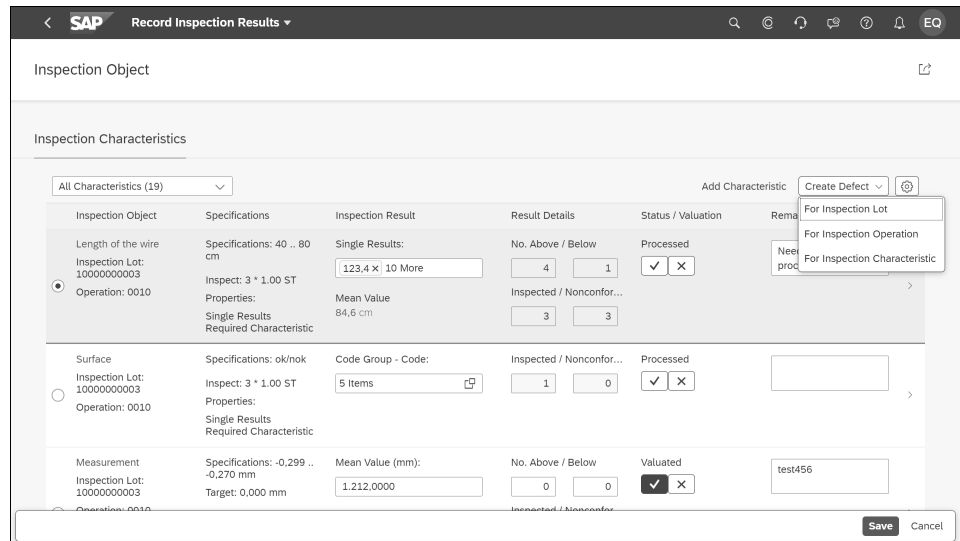


Figure 5.15 Defect Creation Options in the Inspection Results Recording Screen

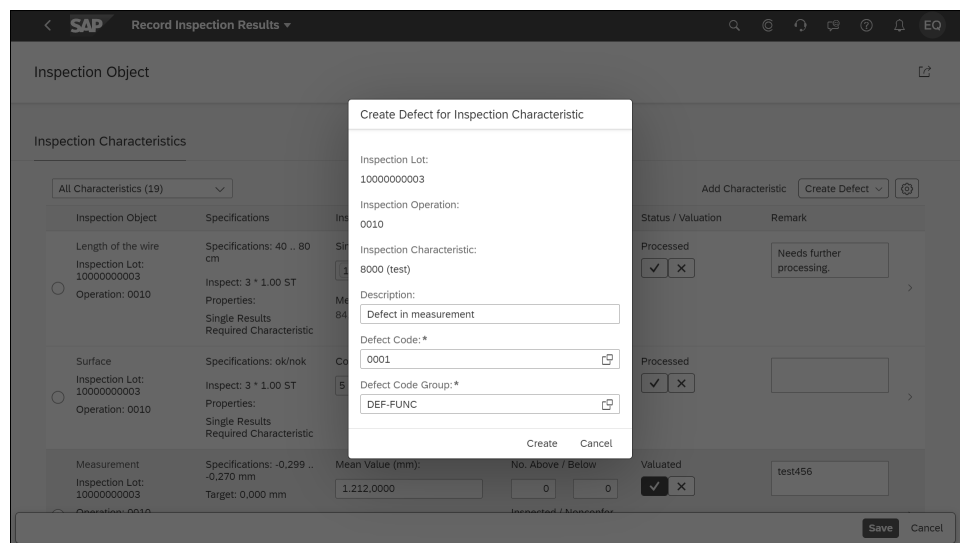


Figure 5.16 Create Defect for Inspection Characteristic Screen

Characteristics valuation is done automatically based on the valuation modes after recording the results. The Record Inspection Results app allows you to filter the inspection-related information for specific search criteria, such as inspection lot, origin, or material, and record the results in the form of a summary or single value.

Figure 5.17 shows the progress of characteristics after the results are recorded. Here, of the two characteristics for inspection lot 1000000004, only one has been completed. You can select one or more inspection lots and record the inspection results.

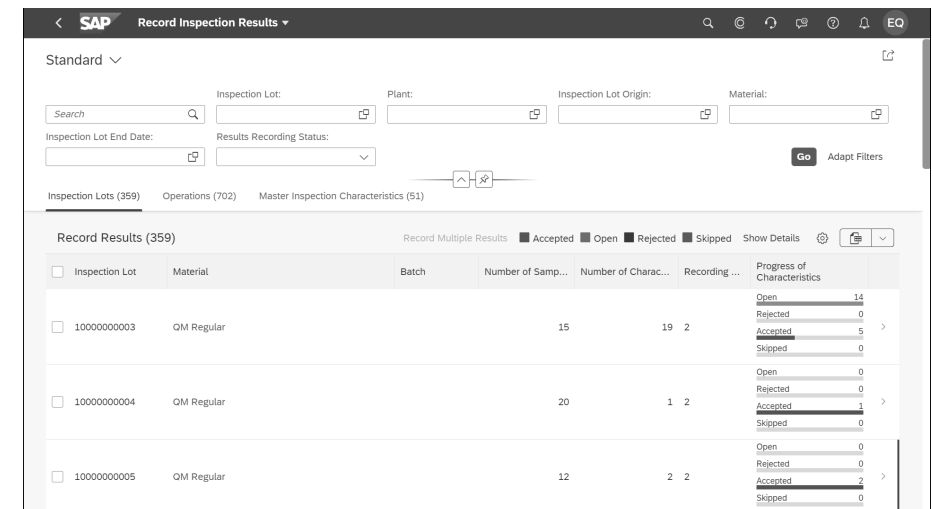


Figure 5.17 Progress of Characteristics in the Record Inspection Results Screen

Record Results for Inspection Points

The Record Results for Inspection Points app facilitates the capturing of multiple results for a common inspection lot operation as required by the business. Inspection lots are displayed along with the order, material, and plant details, as shown in Figure 5.18.

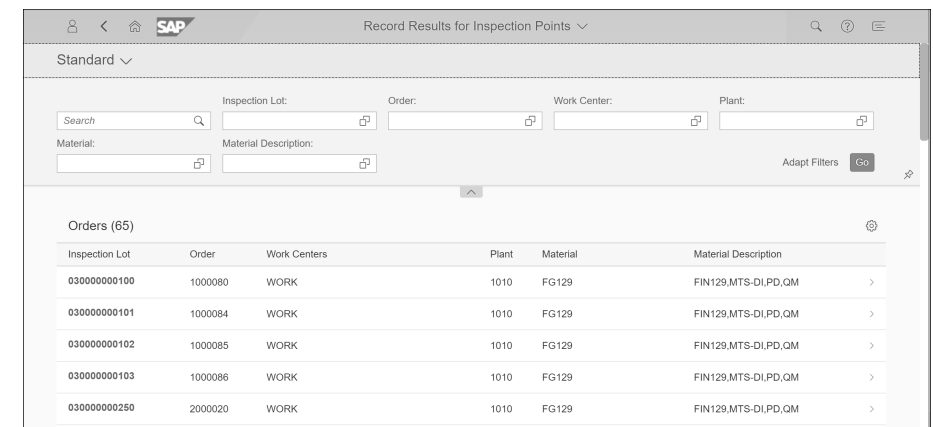


Figure 5.18 Record Results for Inspection Points

Select any inspection lot to view the inspection points and the progress of the characteristics, end date, and valuation history. Figure 5.19 shows the progress for 24 inspection points assigned to operation 0020 of inspection lot 3000000101. Planned end dates and times show the processing status of whether the activity to record multiple results for the inspection points was completed on time or is delayed.

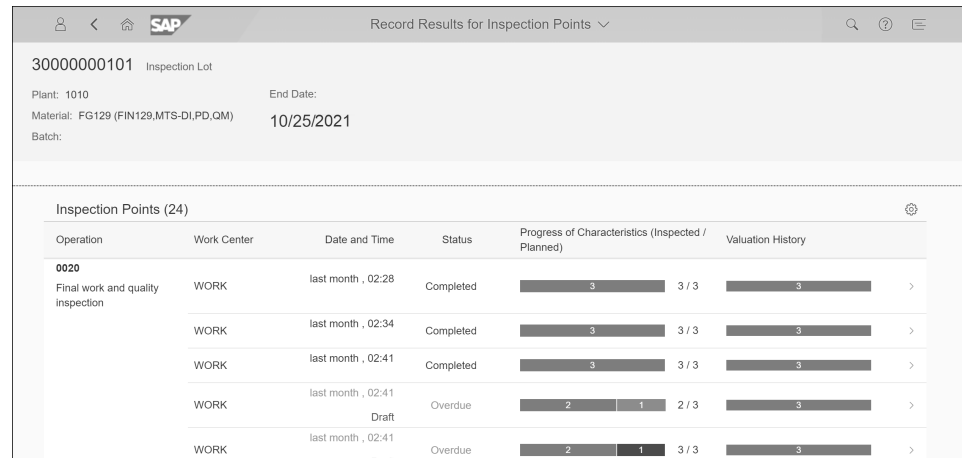


Figure 5.19 Progress Status of Inspection Points

Inspection points can be selected, and the results are recorded on the same screen. Users can view the processing status of the characteristics and can also add remarks if required, as shown Figure 5.20.

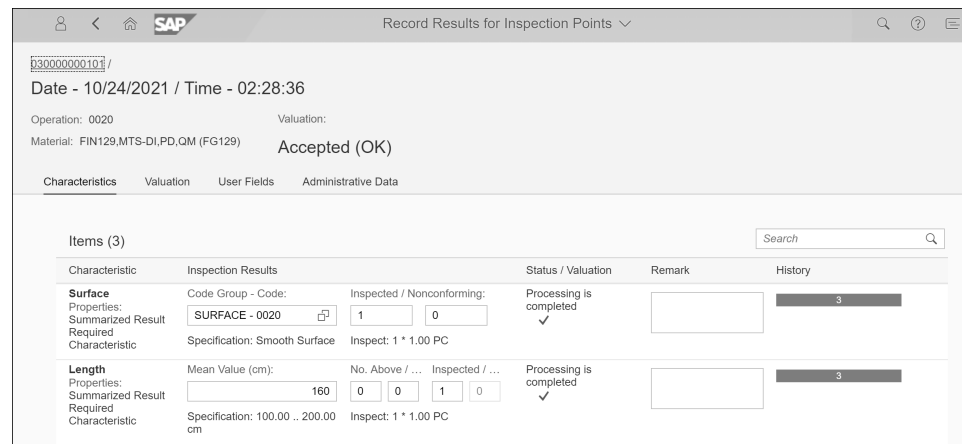


Figure 5.20 Inspection Results and Processing Status of Characteristics

Manage Quality Tasks

With SAP S/4HANA, quality managers can view quality tasks, change the statuses and dates of tasks, and assign the processor through an SAP Fiori app called Manage Quality

Tasks. You can view the quality tasks based on search criteria, such as task status, defect categories, processor assignment, and planned end dates, as shown in Figure 5.21.

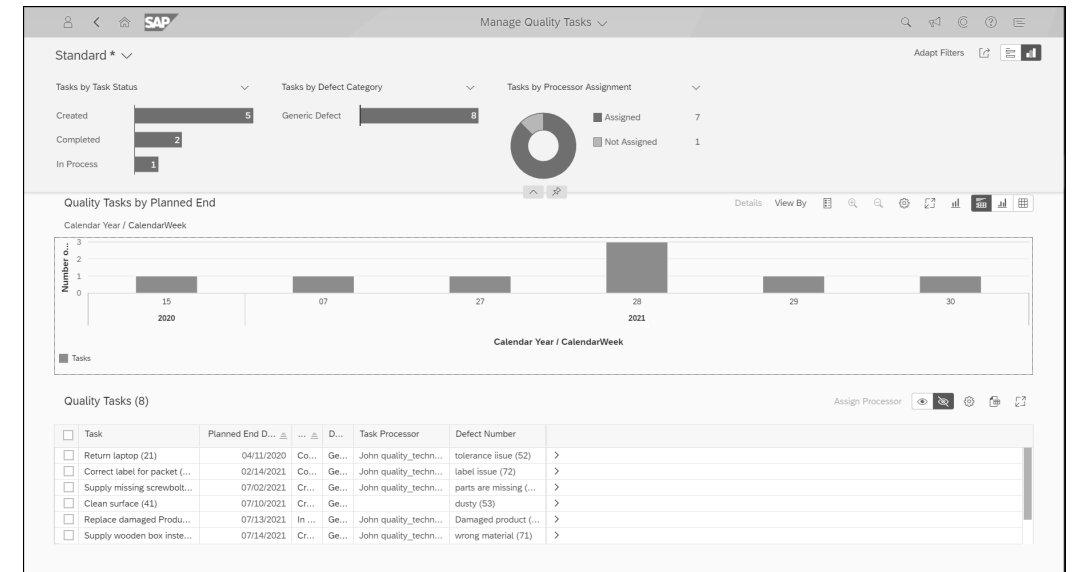


Figure 5.21 Manage Quality Tasks App

You can also navigate to view and edit contextual information related to a quality task or to a defect, as shown in Figure 5.22.

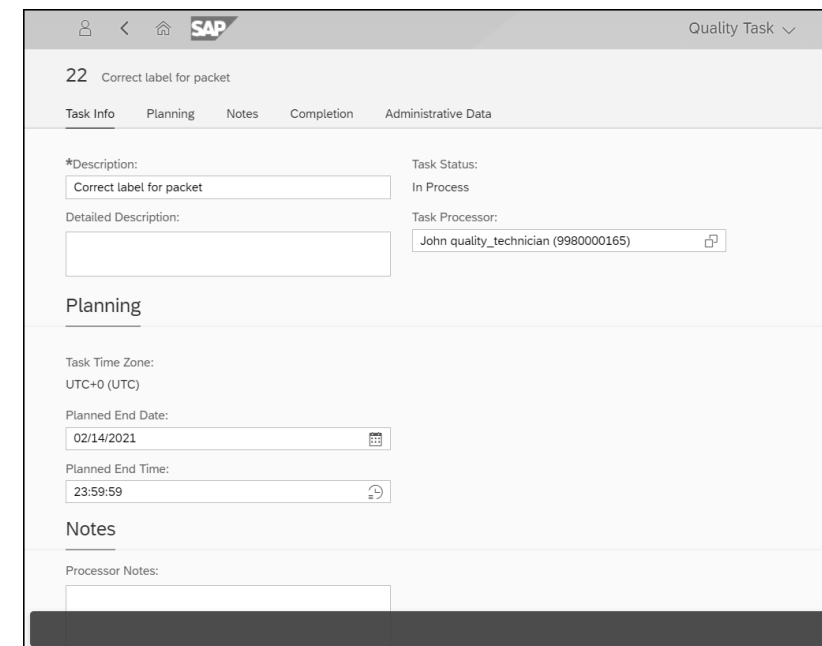


Figure 5.22 Quality Task Information Editing Screen

Manage Usage Decisions

A usage decision specifies whether the goods in the inspection have been accepted, rejected, partially accepted, accepted with condition, and so on. Acceptance or rejection of an inspection lot determines whether the material will be further processed or scrapped/sent to blocked storage, respectively.

The Manage Usage Decisions app, shown in Figure 5.23, provides an enhanced view of inspection lots and helps you manage the usage decisions against them. You can generate a list of inspection lots based on the filter criteria (e.g., inspection lot origin, lot number, and result recording status) and can view or change the usage decision for the displayed inspection lots. If a particular inspection lot doesn't have a usage decision yet, then this app helps quality managers identify the lot and determine a usage decision for it.

Inspection Lot	Inspection Lot Text	Inspection Type	Plant	Batch	Material	End of Inspection	Number of Charact.	Rejected / Total Characteristics	Usage Decision Code	Defects
1800001262		Goods Receipt Inspection for Order	DCAPS US Production	000000780	Outer skin (Purch M8) (Revised)	24.02.2020	2	0 / 2	Quality test completed (0)	0
1800001267		Goods Receipt Inspection for Order	DCAPS US Production	000000780	Outer skin (Purch M8) (Revised)	26.02.2020	2	0 / 2	Quality test completed (0)	0
1800001269		Goods Receipt Inspection for Order	DCAPS US Production	000000780	Outer skin (Purch M8) (Revised)	27.02.2020	2	0 / 2	Quality test completed (0)	0
1800001309		Goods Receipt Inspection for Order	Deloitte Reimagine Auto Manuf	2450	Tinting Cover	10.03.2020	1	0 / 1	Accept (A)	0
1800001301		Goods Receipt Inspection for Order	Deloitte Reimagine Auto Manuf	2450	Tinting Cover	13.03.2020	1	0 / 1	Accept (A)	0
1800001383		Goods Receipt Inspection for Order	Deloitte Reimagine Auto Manuf	2450	Tinting Cover	13.03.2020	1	0 / 1	Accept (A)	0
1800001364		Goods Receipt Inspection for Order	Deloitte Reimagine Auto Manuf	2450	Tinting Cover	16.03.2020	1	0 / 1	Accept (A)	0
1800001501		Goods Receipt Inspection for Order	Deloitte Reimagine Auto Manuf	2450	Tinting Cover	16.04.2020	1	0 / 1	Accept (A)	0
1800001502		Goods Receipt Inspection for Order	Deloitte Reimagine Auto Manuf	2450	Tinting Cover	16.04.2020	1	0 / 1	Accept (A)	0
1800001504		Goods Receipt Inspection for Order	Deloitte Reimagine Auto Manuf	2450	Tinting Cover	16.04.2020	1	0 / 1	Accept (A)	0

Figure 5.23 Manage Usage Decisions App

The quality level is updated based on the inspection results. The system uses this quality level to determine the inspection stage for the next inspection of the material or of the material supplier/material manufacturer and material/customer combinations.

5.4.3 Sample Management

You can use the sampling procedure to define rules that specify to the system how to calculate the required sample size. The sampling procedure also contains relevant information about the valuation of an inspection (e.g., attributive, variable, manual, etc.).

The following are the key parameters in sampling:

- **Sampling type**

Choose how the system should determine the sample size (e.g., 100% sample size, fixed sample size, percentage of total lot size, sample size based on sampling scheme, etc.).

- **Valuation mode**

Define the rules for accepting or rejecting samples or characteristics (e.g., characteristics to be accepted or rejected based on the number of nonconforming units, number of defects, or manual valuation).

- **Inspection points**

Record results with a predefined frequency of time or quantity.

We explore a few key SAP Fiori apps for sample management in the following sections.

Display Sampling Procedure

Display Sampling Procedure is a standard SAP Fiori app that displays information on the sampling procedure general data, such as sampling type and valuation mode. The app provides a holistic view of multiple inspection samples, valuation according to the characteristic attribution codes, inspection points, usage indicators and administrative data, and so on. The app allows you to define rules for sample size calculation and the type of valuation of an inspection characteristic for result recording.

In Figure 5.24, sampling procedure **DT_SMPPR** is displayed with the determination rule set as **Fixed Sample**; the procedure is set to not allow multiple samples for inspection. You can also specify that the sampling procedure will allow inspection with or without the inspection points.

Assignments	Multiple Inspection Samples	Additional Data	Administrative Data
Sampling Scheme: DT_SMPPR Fixed Sample	Inspection Points: Without Inspection Points	Blocked for Usage: No	Skip Inspection Stage Change: No
Determination Rule: Fixed Sample (10)		Used in Inspection Plan: Yes	
Multiple Inspection Samples			
Number of Samples: 0	Valuation Rule: -	Multiple Samples: No Multiple Samples	
Additional Data			
Sample Size: 10	Acceptance Number: 10		
Administrative Data			
Created On: 30.04.2021	Created By: GAURAV SHARMA	Changed On: 30.04.2021	Changed By: GAURAV SHARMA

Figure 5.24 Display Sampling Procedure Screen

Display Sample

The standard SAP Fiori app Display Sample shows a sample business object. Key features include detailed sample information, such as material, quantity, inspection lot, status, and administrative data, detailed information about sample drawing, and inspection lot data, as shown in Figure 5.25.

Figure 5.25 Display Sample App

5.5 Quality Improvement

During the quality improvement process of quality management, quality personnel take reactive measures based on the inspection results of the incoming or in-process goods if they don't conform to specified quality standards.

Quality notifications are the primary vehicle for improvement; through them, managers record the defects found during the inspections, identify the types of the defects, and identify mitigation tasks required to rectify the defects.

Quality control helps update the vendor evaluation for the procurement process based on historical inspection results and usage decisions. Using quality control, an organization can categorize its vendors based on the quality of the goods supplied and can fine-tune the procurement process for future requirements.

We explore key functionality and SAP Fiori apps for quality improvement in the following sections.

5.5.1 Quality Notification

A *quality notification* is used to capture and describe a business object's nonconformance with a quality requirement (e.g., incoming goods from a supplier) and contains a request to take necessary actions.

SAP S/4HANA already contains various types of preexisting quality notification types. The notification type is created with reference to a notification category and an origin. The category of a notification is fixed based on the notification's origin. The following notification types are available:

- **Customer complaint**

This type of notification results from a problem involving poor quality goods or services delivered to a customer. A notification of this type can be used to record a customer complaint and process a problem that is reported by the customer.

- **Complaint against a vendor**

This type of notification is generally used for issues or complaints involving poor quality goods or services delivered by a vendor or manufacturer. A notification of this type can be used to record and process a problem that was confirmed in a delivery.

- **Internal problem notification**

This type of notification deals with nonconformance of quality regulations within an organization. An internal problem notification is used to record and report problems such as defects in a material produced in-house.

There's one key quality notification app in SAP S/4HANA to highlight. The SAP Fiori app Create Quality Notification enables you to record defective items along with the problem descriptions. It captures reference objects such as material, purchase order, and delivery. The Create Quality Notification app contains subsections in which you can define the defect overview (e.g., defect location and type) and cause codes to describe the root cause. Tasks are identified and documented to the work resources with start and finish dates. While processing the notification, various activities are performed to resolve the defect and are then updated in the quality notification. A quality notification order is created and assigned to the notification to capture the cost of the activities performed. Figure 5.26 shows the **Create Notification: Vendor Error** screen, where you must input mandatory parameters like **Notification type (F2 Vendor Error)**, **Material**, **Plant for Mat.**, and **Purchasing Doc.**

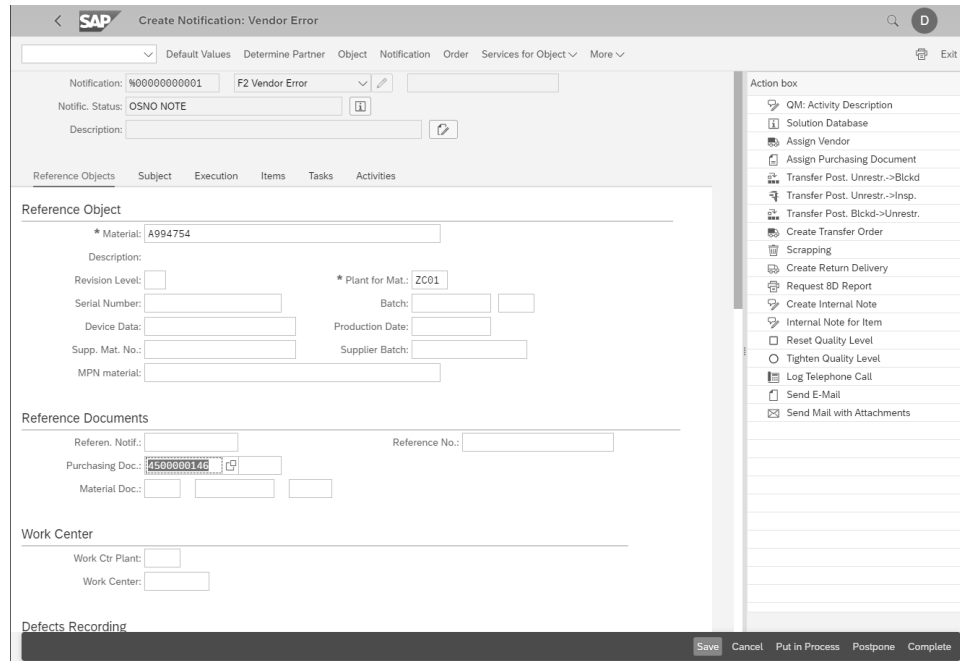


Figure 5.26 Create Notification for Vendor Error App

In Figure 5.27, a quality notification for vendor error has been created for purchasing document 4500000478, which has a subsequent material document.

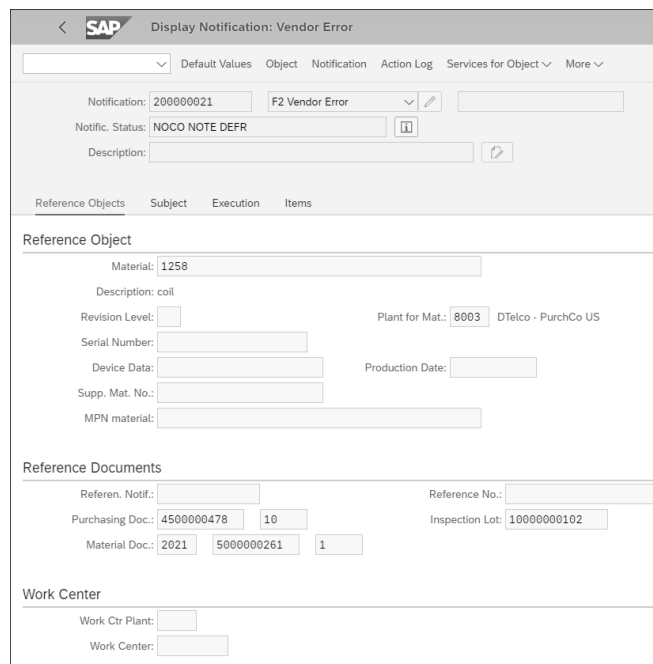


Figure 5.27 Display Quality Notification for Vendor Error

Notifications can be created with a priority (very high, high, medium, or low) to identify the sense of urgency and to ensure the lead time on the corrective action to be taken on the notification. Specifying a priority for the notification helps the system calculate the start and end dates for processing the notification.

5.5.2 Quality Certificates

Quality certificates guarantee that specific manufacturing procedures or working practices have been followed and that defined inspections based on regulations, standards, customer specifications, or other agreements have taken place.

A quality certificate verifies the quality of goods. The certified physical or chemical properties of goods can be recorded as inspection results or documented as batch characteristics. General certificates can be created for materials or customer-specific certificates whose content and layout are modified to meet customer requirements.

With the Manage Quality Certificates for Inspection Lots app, shown in Figure 5.28, you can create and print quality certificates for the inspection lots for which usage decisions are made. These quality certificates display the inspection results of the characteristics in the inspection lots. However, the characteristics whose results are to be printed on the quality certificates are determined in the certificate profiles.

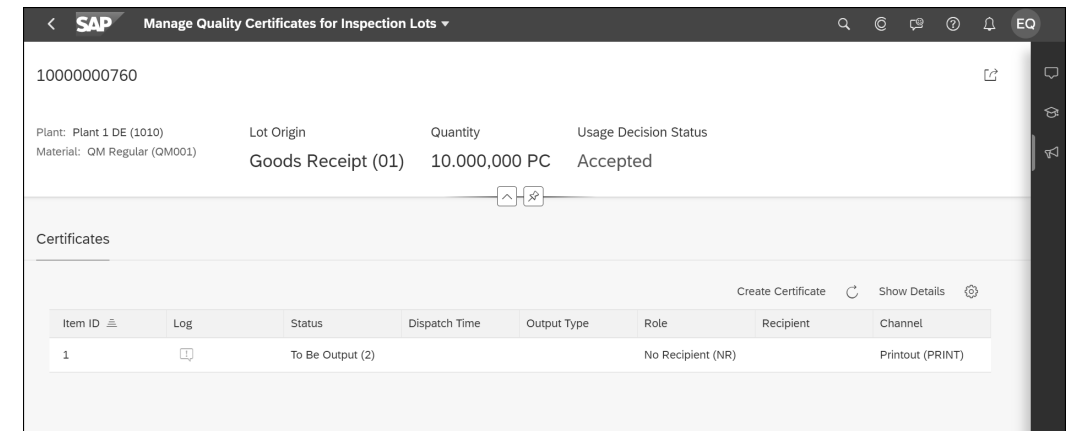


Figure 5.28 Manage Quality Certificates for Inspection Lots App

5.5.3 Quality Control

Quality control helps update the vendor evaluation for the procurement process based on historical inspection results and usage decisions. Using quality control, an organization can categorize its vendors based on the quality of the goods supplied and can fine-tune the procurement process for future requirements.

Defect recording in SAP S/4HANA allows quality managers to capture different types of records that are identified at the time of inspection. Quality notifications can be used to analyze the defects identified and to perform root cause analysis on any property or attribute of a product, material, or process that doesn't meet the inspection characteristic specifications.

Defect records serve as an important source of information for quality control in various production environments. By capturing defects, recording them in a thorough manner, and analyzing them, an organization can improve the quality of its products and services and optimize its processes for more efficiency. Defect recording is carried out with the help of predefined defect codes maintained in the inspection catalogs.

Defect recording can be used primarily in two major areas. First, during the manufacturing of complex products or systems (e.g., cars) or industrial equipment (e.g., heavy earthmoving machinery), defect recording is an important tool for monitoring consistency in production. Records are required to identify quality problems in the production process, evaluate the defect data, and pinpoint the issue at hand. Second, defect records come in handy in the manufacturing of less complex, single parts, such as nuts, bolts, or bearings, to identify the reason for the poor quality of the material.

To record an identified defect, an inspection must have been completed on an inspection lot, and the results of the inspection must have been recorded. As shown in Figure 5.29, either SAP S/4HANA can create defect records automatically during results recording, or users can create defect records manually using the defect recording function.

Figure 5.29 Defect Recording Screen

Manage Defects

With the Manage Defects app, you can view defects that are centrally filtered based on criteria such as material, inspection lot origin, and defect code. The app also gives an option to drill down further to view defects by creation date, inspection lot, and notifications triggered. In Figure 5.30, the pie chart type is selected, and for defect 12, we can process subsequent actions like **Transfer Defects to Notification** for this generic defect.

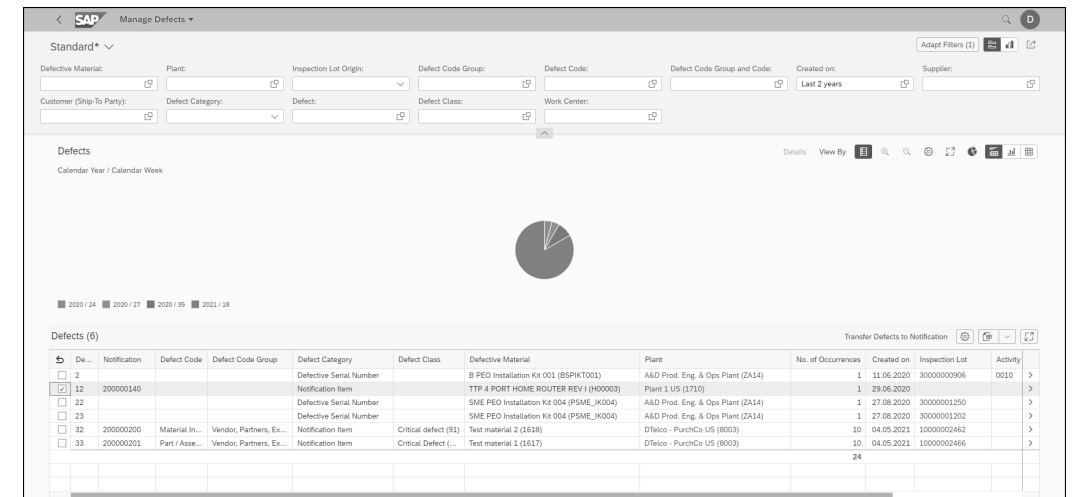


Figure 5.30 Manage Defects App

5.6 Reporting and Analytics

SAP S/4HANA offers more flexibility in viewing business-relevant data acquired over multiple transactions that were carried out during the operation of quality processes. SAP S/4HANA offers detailed analytics applications that drill down to organizational elements for reporting.

In the following sections, we provide an overview of SAP Fiori lighthouse apps that are relevant for quality management. SAP Fiori lighthouse apps condense all the information to help you take immediate action. They are basically a set of intuitive, actionable cards that can be filtered based on key performance indicators (KPIs) per your requirements. To use these apps, it's advisable to use holistic business roles, which are classified based on industry sectors and core businesses.

5.6.1 Manage Quality Levels

The Manage Quality Levels app enables you to view and process inspection lots and their characteristics. You can display the quality levels based on the filter criteria, such

as material, plant supplier, and so on. The app provides a microchart view of inspection lots and allows you to navigate freely to view contextual information on material and quality levels and to edit the inspection stages. For example, all the materials listed in Figure 5.31 will undergo a normal inspection, and the succeeding inspection won't be skipped due to historical readings.

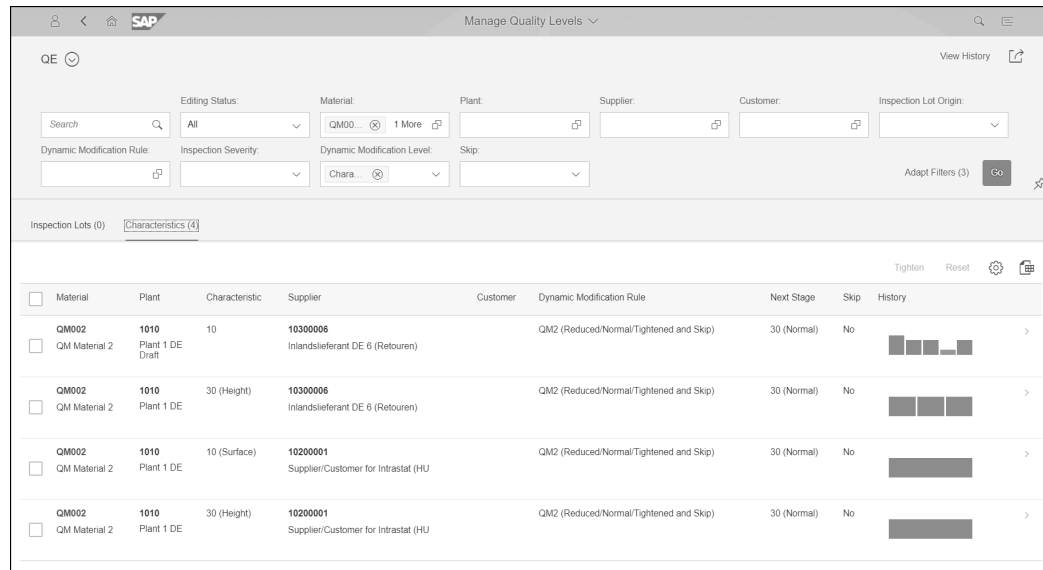


Figure 5.31 Manage Quality Levels App

5.6.2 Quality Technician Overview

The Quality Technician Overview app has four cards that can be arranged as needed. The **Inspection Lots Without Inspection Plan** card, shown on the left-hand side of Figure 5.32, sorts the inspection lots that don't have inspection plans by creation date. Clicking on the header takes you to the Manage Inspection Lots app, while selecting an item takes you to the **Change Inspection Lot** screen. The second card, **Inspection Lots with Open Results Recording, No Inspection Points**, shows you the total number of inspection lots for which results recording has not started or is in process. Selecting the header takes you to the Record Inspection Results app. The column chart (**Inspection Lots with Open Results Recording for Inspection Points**) shows the inspection lots that are overdue.

Finally, the **My Tasks** card, shown in Figure 5.33, enables quality technicians to see the quality tasks assigned to them that are either in the “created” or “in process” status, sorted by planned end date. Selecting the header routes you to the Process Quality Tasks app, while selecting an item routes you to the **Quality Task** screen.

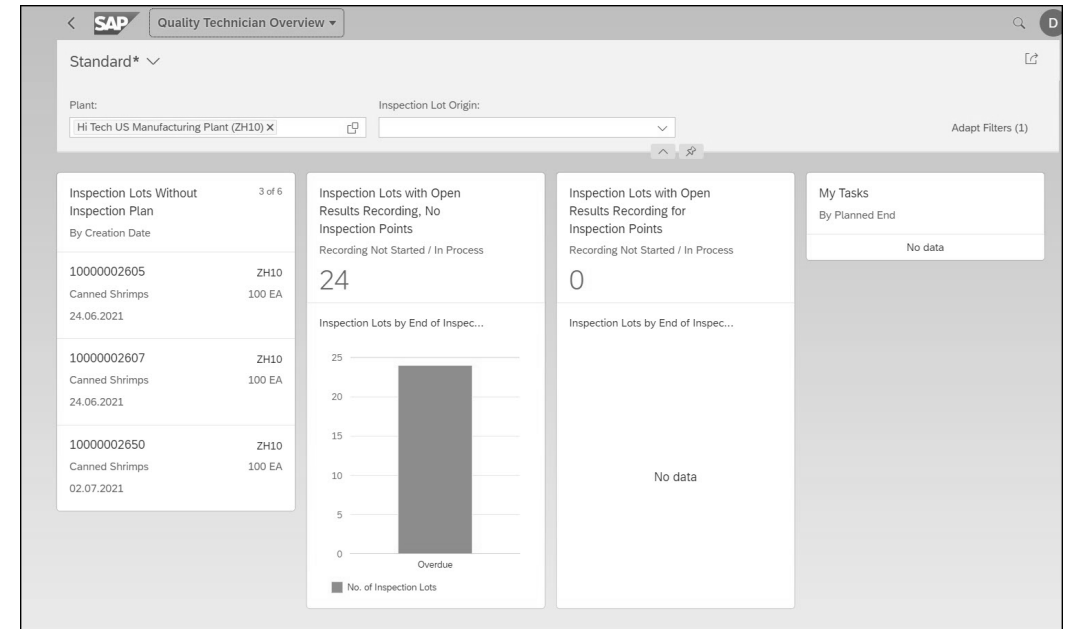


Figure 5.32 Quality Technician Overview App

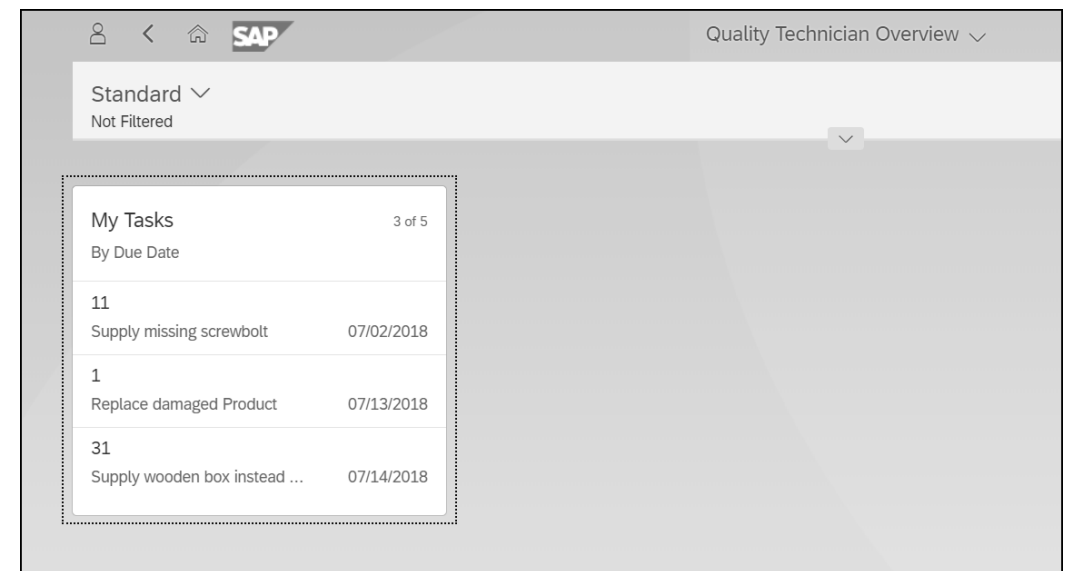


Figure 5.33 My Tasks in the Quality Technician Overview App

5.6.3 Quality Engineer Overview

In the Quality Engineer Overview app, shown in Figure 5.34, you get a different set of actionable cards, like **Inspection Lots Without Usage Decisions**. Selecting this card's header takes you to the Manage Usage Decisions app. The quality engineer can also get an understanding of the number of inspection lots that are ready for usage decisions (i.e., inspection lots with a complete result recording status and those with no deviations) using the **Inspection Lots Ready for Usage Decision** card. Selecting the right side of this card opens a collection of scrollable cards, each representing an inspection lot that is ready for a usage decision along with an option to make a quick usage decision for that inspection lot.

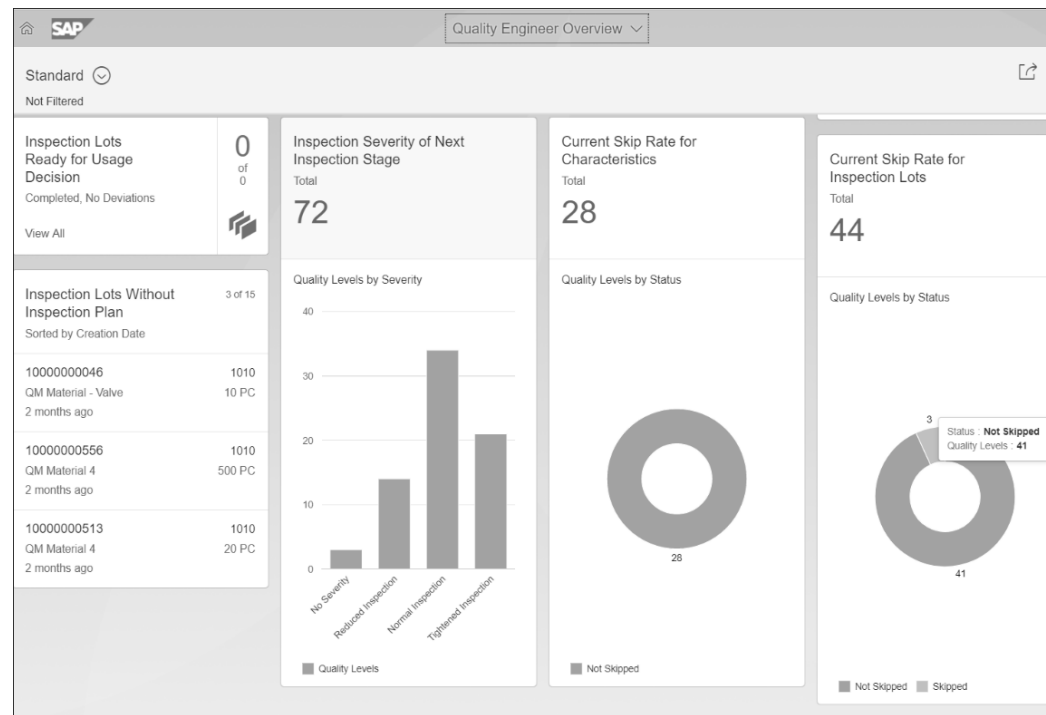


Figure 5.34 Quality Engineer Overview App

5.6.4 Inspection Lot Analytics

The Inspection Lot Analytics app, shown in Figure 5.35, enables you to flexibly analyze inspection lots for which usage decisions have already been made. It also provides insight into inspection lots with usage decisions such as accepted and rejected lots, rejection rate, skip rate, total number of lots, and other relevant information.

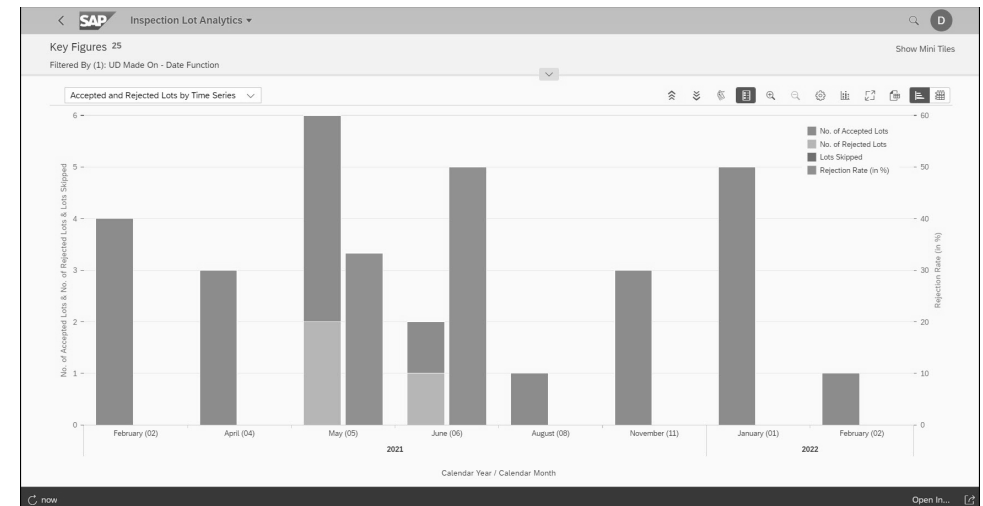


Figure 5.35 Inspection Lot Analytics App

5.6.5 Inspection Lot Detailed Analytics

The Inspection Lot Detailed Analytics app provides you with more detailed information to analyze inspection lots. You can analyze inspection lots with usage decisions based on multiple categories, such as accepted or rejected lots, rate of rejection, skip rate, average processing time based on supplier, and material and plant.

The example in Figure 5.36 gives insight into accepted or reject lots based on the day the usage decision was made. Here, there were three accepted lots and two rejected lots in the first week of May, and one accepted and one rejected lot on June 15th.

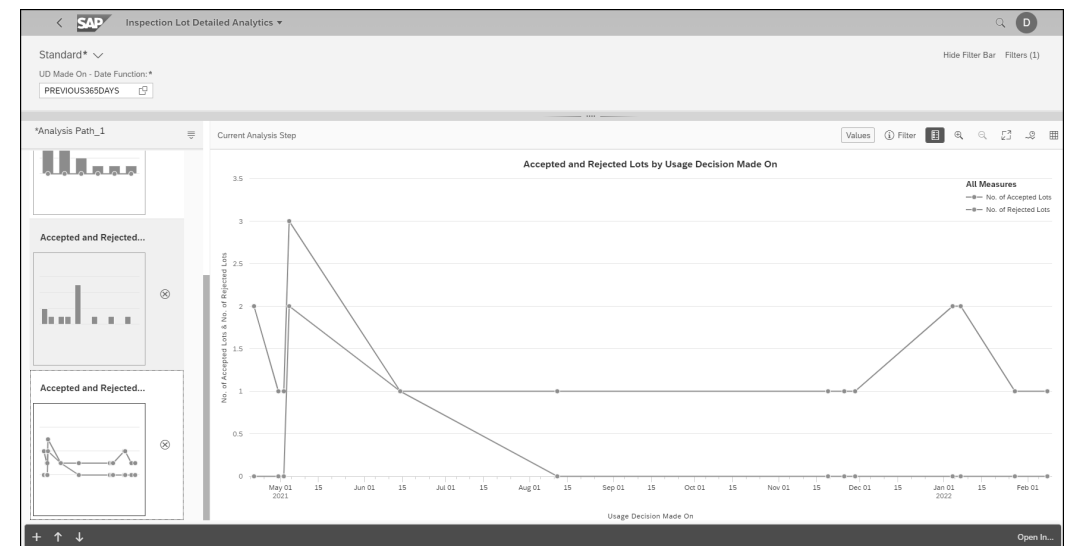


Figure 5.36 Inspection Lot Detailed Analytics App

Figure 5.37 shows the available categories for analysis paths, which can be added by clicking the + icon. It's important to add and save an analysis path in order to view detailed charts and information.

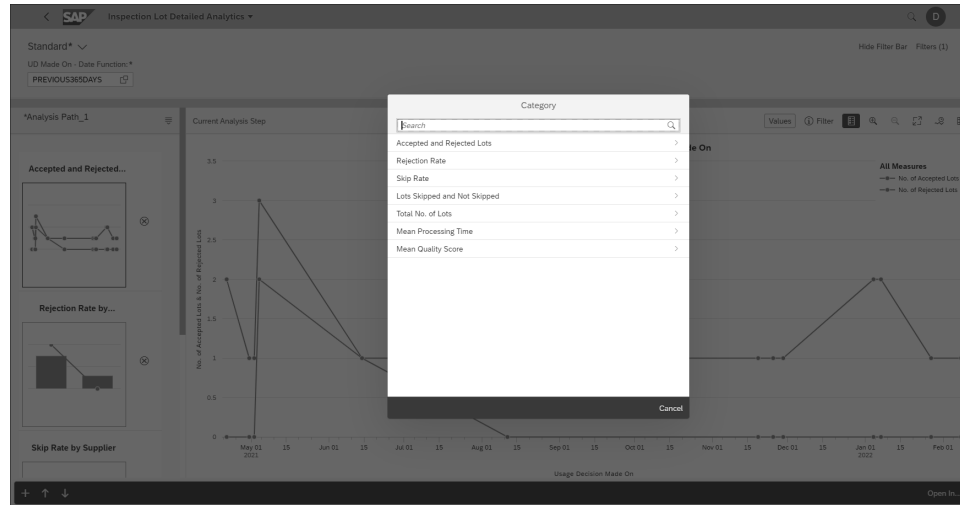


Figure 5.37 Categories of Analysis Paths in the Inspection Lot Detailed Analytics App

5.6.6 Results History

The Results History app allows you to view the results history for an MIC or a task list characteristic. The app displays a graphic view of the valuation of a characteristic for a set of inspection lots, allowing you to compare the inspection results over a period time, as shown in Figure 5.38.

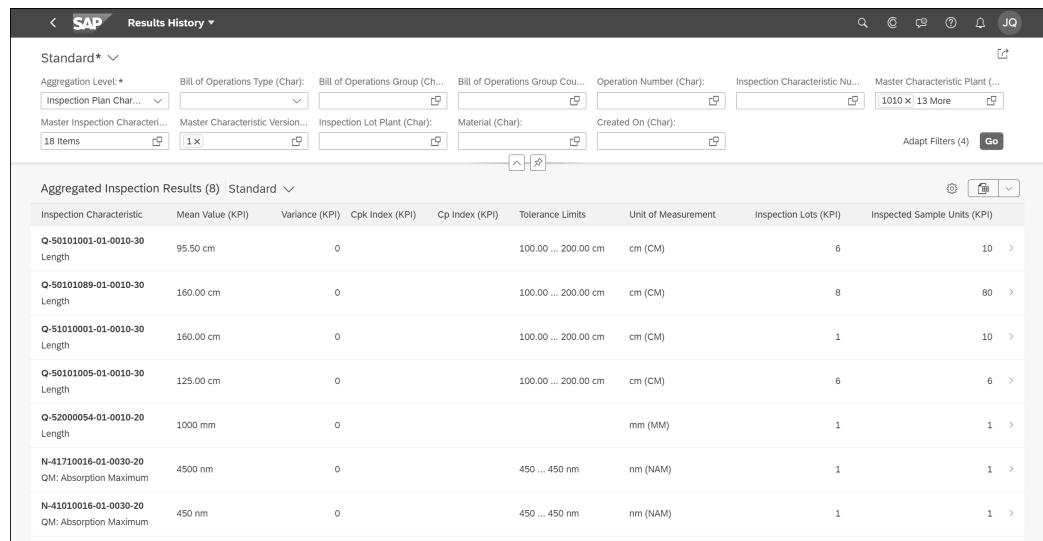


Figure 5.38 Results History for Inspection Characteristics Screen

5.6.7 Record Defects

The Record Defects app, shown in Figure 5.39, helps the quality engineer/quality technician record defects for materials, add warehouse-relevant data for materials, and enter data specific to extended warehouse management (EWM), such as source storage bins and production supply areas, to identify the stock of the defective material.

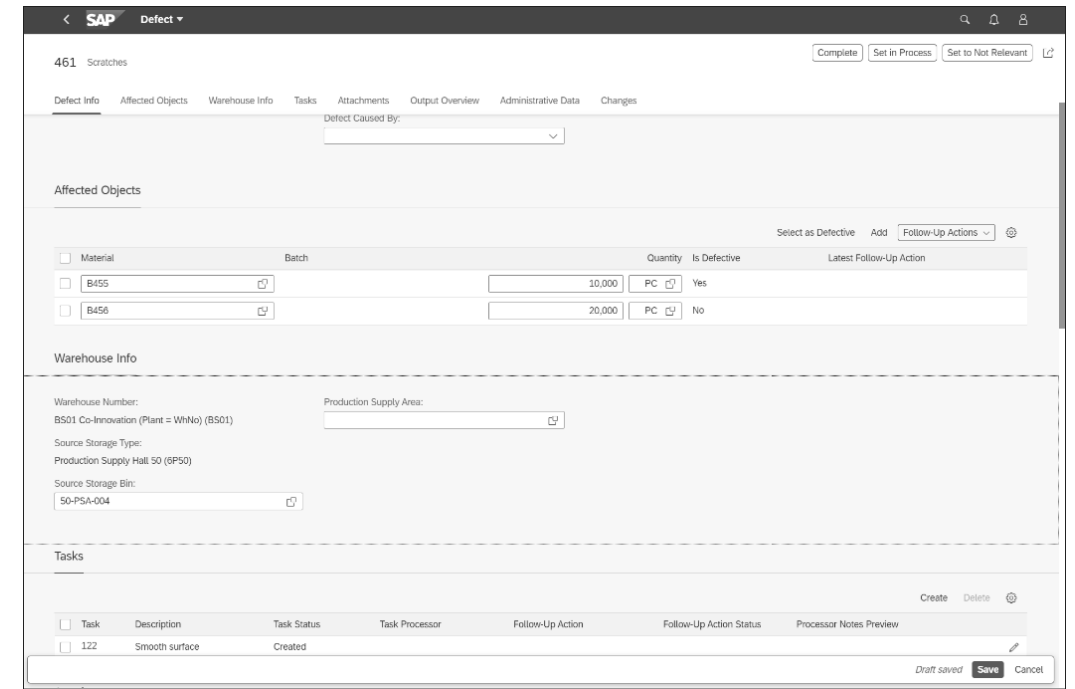


Figure 5.39 Defect Info Screen

5.7 Summary

Quality management plays a key role in an organization's reputation for reliability because the regular inspection of critical machinery helps the business ensure better longevity and performance. With SAP S/4HANA, an organization can get a clear view of the quality metrics, track quality across the business, and finally react to potential problems with the goods that it manufactures or receives. Vendors with a poor track record can be easily identified and blocked for future transactions, and critical pieces missing in the supply chain for production can be handled effectively. Thanks to SAP S/4HANA's easy user interface (UI), key business data can be recorded, tracked, and worked on proactively.

We covered key quality management topics in this chapter, including basic functionality for procurement, production, and sales and distribution. We also covered key changes in the master data in SAP S/4HANA and explored the available SAP Fiori apps

for quality planning, quality inspection, and quality improvement. To conclude the chapter, we took a look at SAP Fiori analytical apps for reporting.

The next chapter explains the plant maintenance functionality in SAP S/4HANA.

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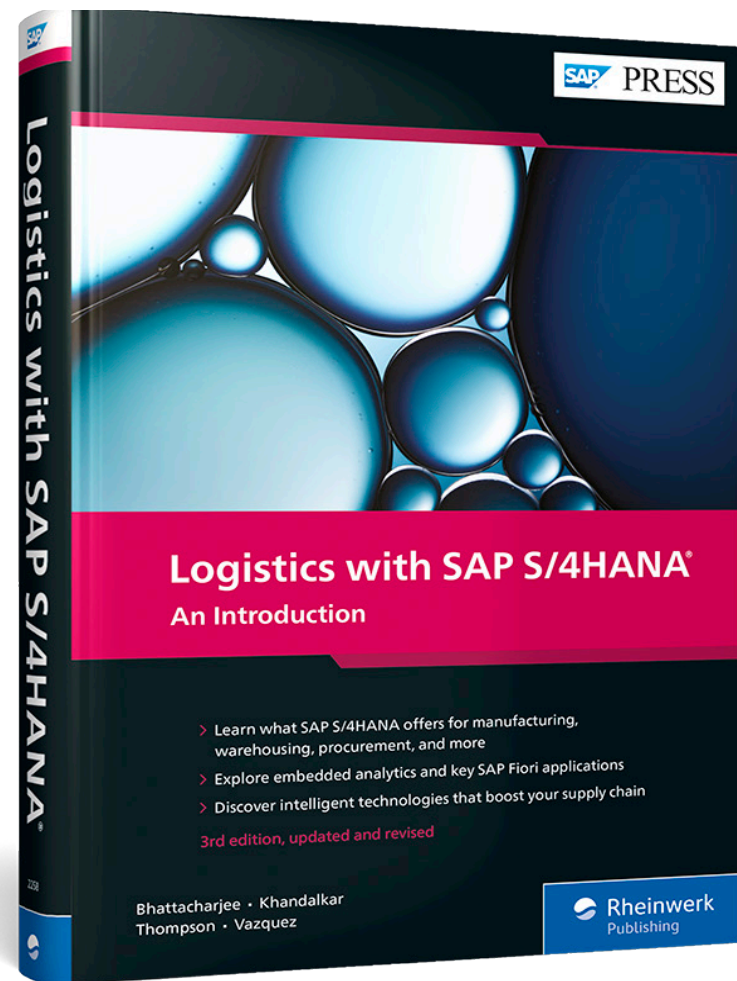
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