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Product Prioritization based on Shelf life with Advanced ATP

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Abstract

This article delves into the critical significance of prioritizing products based on their shelf life, highlighting its importance across various sectors such as food and beverage, pharmaceuticals, and consumer goods. Companies often face substantial challenges when it comes to effectively managing their product lineup according to expiration dates or best-before timelines. This mismanagement can lead to excessive backlog of products, the accumulation of unsellable inventory, and considerable financial setbacks.

The article will examine the specific hurdles faced in shelf life-based product prioritization, including the complexities of forecasting demand, understanding consumer behavior, and the logistics of inventory turnover. Furthermore, it will propose actionable strategies for integrating shelf-life considerations into real-time sales order processing mechanisms. By adopting these practices, businesses can ensure they are making timely commitments to customers while simultaneously optimizing their inventory management. This proactive approach can lead to enhanced operational efficiency, reduced waste, and ultimately, improved profitability.

Keywords: Shelf-Life ATP, Inventory Optimization, SAP technologies, Advanced ATP

I. INTRODUCTION

An "Advanced ATP Check," or "Advanced Available-to-Promise" check, represents a sophisticated method utilized within SAP systems for validating the availability of stock in order to fulfill incoming customer orders. This approach significantly enhances the allocation process by going beyond traditional inventory assessments, which typically only account for the current stock on hand. Instead, the advanced ATP check integrates a multitude of critical supply chain factors, including current production schedules, potential transportation constraints, and specific customer priority demands. By leveraging real-time data from the supply chain, this refined methodology ensures that businesses can provide customers with a more accurate and reliable order promise date, affording a comprehensive overview of stock availability and increasing customer satisfaction.

a) Alternate-Based Confirmation

The term "alternate-based confirmation check" refers to a specific functionality within SAP systems, notably within the Advanced Available-to-Promise (AATP) module. This feature is particularly beneficial when the initially requested product or its designated location is unavailable, as it allows the system to identify and propose alternative solutions to fulfill a customer order. These alternatives can involve substitutions from different production plants or the use of similar materials, ensuring that delivery timelines and customer requirements are met efficiently. Essentially, this advanced process

empowers organizations to confirm sales orders even in instances of stock unavailability by pinpointing alternative fulfillment sources.

When processing sales orders, various essential attributes come into play. The most critical among these are the specified product, the quantity requested, the delivery plant location, and the desired delivery date. Within the framework of SAP S/4HANA, Alternative-Based Confirmation (ABC) evaluates possible alternative options when the original product's stock at the requested delivery plant does not suffice to meet the delivery date specified in the sales order.

ABC functionality allows for a dynamic exchange of the originally requested delivery plant, storage location, or product with potentially suitable alternatives to enhance the likelihood of confirming orders successfully. The system employs a heuristic approach to automatically assess an array of possible alternatives—such as providing a larger quantity or proposing an earlier delivery date—and identifies the most advantageous option, especially when multiple alternatives can equally satisfy a requirement.

Alternative Determination

When using Alternative-Based Confirmation (ABC) to find substitutes for a designated delivery plant, storage location, or product in sales order requirements, it is vital to configure alternative determinations meticulously. This process is managed through the Configure Alternative Determination application, where organizations can establish their specific substitution strategies. The Alternative Determination field plays a crucial role in outlining the prioritization of available options, ensuring that the most relevant substitutions are considered first.

Each alternative determination outlined in the substitution strategy becomes evident on the Review Availability Check Result screen, specifically within the Alternatives subsection of the Results sub-screen. This interface provides a confirmation proposal that highlights the alternatives available for fulfilling the original request. For a deeper understanding of this process, users can refer to the section discussing Alternative Confirmation Proposals.

Alternative determinations are anchored on two primary components: rating attributes and complex constraints.

Rating Attributes: These attributes signify specific objectives that any confirmation needs to accomplish. The system can evaluate multiple confirmations based on varying values for each rating attribute, thereby enabling users to prioritize effectively. Users have the capacity to designate numerous rating attributes, allowing the system to tackle the highest priority attribute first, followed by the secondary attributes, and so on.

Hard Constraints: In contrast, hard constraints are mandatory requirements that any proposed alternative must adhere to in order to be considered valid. All linked hard constraints to an alternative must be satisfied; thus, prioritization does not apply in this situation.

This structured approach equips organizations with the capability to manage and fulfill sales order requirements efficiently through the strategic application of alternative solutions, thereby enhancing operational effectiveness and customer service.

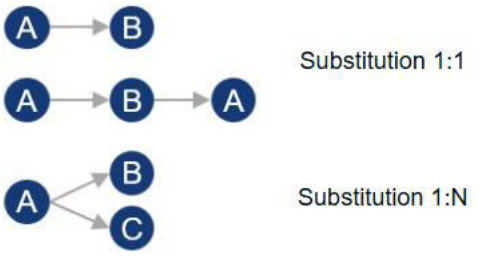

Fig. 1. Substitution sequence in Advanced ATP

b) Product prioritization within Advanced ATP

In accordance with the alternative determination and substitution strategy, an evaluation is conducted based on product availability. This assessment considers the available quantity, including stock, issues, and receipts. Products are prioritized accordingly.

Fig. 2 illustrates the product prioritization process utilized in Advanced Available-to-Promise (ATP).

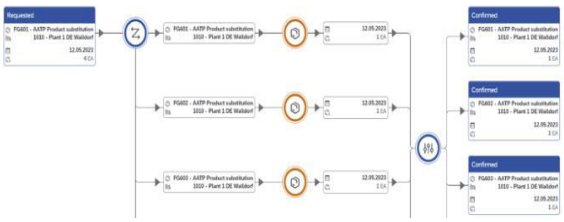

Fig. 2. Illustration of product priortization in the sales order

c) Shelf-Life of the inventory

The term "shelf life of a batch" specifically refers to the period during which a distinct production run, known as a batch, of a product can be stored without compromising its quality, safety, or efficacy. This time frame is critical as it determines how long the product can remain accessible for sale or use, provided it is kept under the appropriate storage conditions prescribed by the manufacturer. In simpler terms, it represents the maximum duration that a particular batch can be available on store shelves before it is considered expired.

The assessment of shelf life typically begins from the date the product was manufactured, taking into account various factors such as the product's nature, its ingredients, and the environmental conditions it will face during storage.

Effective inventory management heavily relies on meticulously monitoring shelf life for individual product batches. This practice allows businesses to prioritize the sale of older batches, ensuring that products are sold before they reach their expiration date, thus optimizing inventory turnover and reducing waste.

Quality assurance is of utmost importance when discussing shelf life. Once a batch exceeds its established shelf life, there is a significant risk that the product will deteriorate in quality. This deterioration can result

in the loss of important characteristics, such as taste, effectiveness, or safety, thereby rendering the product unsuitable for consumer use.

When actively managing shelf life for a specific material, it is essential to input the expiration date accurately on the stock placement preparation screen when creating a transfer order. This step is vital to ensuring proper tracking and compliance with regulatory standards, preventing older stock from remaining in circulation beyond its safe use period.

In the SAP material master, batch management is activated, and the Shelf life of the product is maintained. Whenever this occurs, the creation of each batch is intricately linked to the date of manufacture, weaving a timeline that reflects both the freshness of the product and its journey. This timeline is further enhanced by the total shelf life of the material, acting as a guiding standard for quality assurance. Remarkably, the shelf-life date is calculated with precision through an automated process, ensuring accuracy and efficiency.

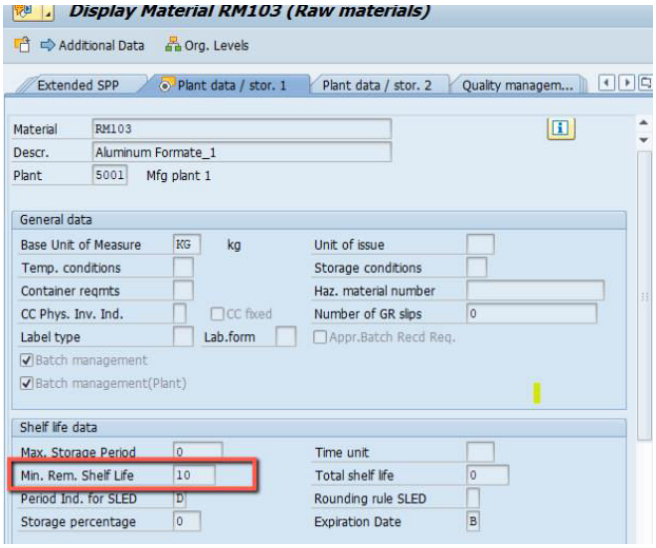

Fig. 3. Illustration of material master with Shelf life in SAP

II. COMBINE SHELF LIFE WITH ALTERNATIVE-BASED CONFIRMATION FOR PRIORITIZATION.

The current product prioritization process does not consider the shelf life of the products. As a result, commitments made to customers regarding product availability sometimes overlook the expiration status of materials. This means that even if a product is nearing its expiration date, confirmations to customers may still proceed if the item is technically available in inventory.

To address this oversight, a custom enhancement is being developed that will integrate an Advanced Available-to-Promise (ATP) system. This enhanced system will incorporate real-time checks of product shelf life during the sales order process. By doing so, it aims to ensure that customer commitments are more reliable and that orders are only confirmed for products that meet a secure shelf-life threshold. This initiative will greatly improve the accuracy of our inventory commitments and foster greater trust with our customers by reducing the risk of delivering products that may soon expire.

a) Activating Alternate-Based Confirmation for Advanced check

Establish enhanced availability check methods categorized by document purpose and assigned checking group. This procedure enables the definition of advanced checking techniques aimed at assessing product availability within the context of an improved Available-to-Promise (ATP) framework. It is important to note that these enhanced check methods are exclusively applicable to sales documents designated by the document purpose code SLS.

Additionally, utilize the designated flag to activate Alternative-Based Confirmation (ABC) specifically for chosen checking groups. In certain cases, implementing alternatives solely to confirm sales order demands might be a strategic decision, particularly when optimizing performance is a priority. This approach allows for a more efficient processing of customer requirements by leveraging alternative sources or methods to meet order fulfillment objectives.

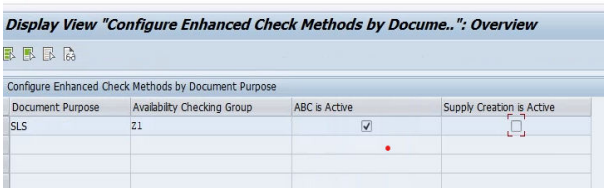

Fig.4. Illustration of ATP Activation in SAP

b) Product Substitution relationship from is 1: Many.

The system allows users to define a controlled order for performing substitutions, enabling greater precision in product management. For each product, you can establish numerous substitution options to enhance flexibility and choice. By assigning specific sequence numbers to these substitutions, you dictate the precise order in which they will be executed. This ensures that the system processes substitutions in the desired sequence, adhering to the user-defined arrangement. Each substitution's sequence is represented by an integer value, which determines its priority in the substitution process. By default, this sequence value is initialized to 0, but users have the ability to customize it according to their needs, facilitating tailored substitution strategies that align with operational requirements.

c) Configure Substitution Strategy

This app shows in Fig.5 that in the context of managing catalog materials within a supply chain system, users have the capability to specify the substitution method employed and determine the alternative criteria that will be activated to verify requirements when a catalog material cannot be validated as initially requested. The system is designed to evaluate all available material-plant combinations that have the potential to meet the specified requirement. This thorough calculation process ensures that no viable alternative is overlooked.

To facilitate this, substitution strategies are meticulously assigned to alternative controls, which can be managed through the Configure Alternative Control application. This app enables users to maintain and modify these strategies effectively, ensuring that the most suitable alternatives are readily available and properly aligned with overarching supply chain objectives. By utilizing these tools, organizations can enhance their operational flexibility and responsiveness when faced with material shortages or discrepancies.

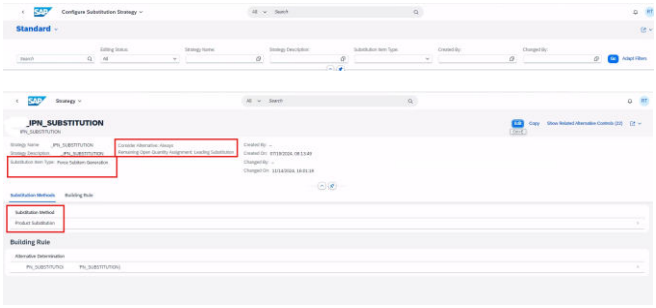

Fig.5. Configuration Strategy in SAP AATP

d) Configure Alternative Determination

This application allows users to establish alternative determinations by selecting from a diverse set of available confirmations, helping to pinpoint the most appropriate alternatives to meet specific sales order requirements. Users can create tailored alternative determinations based on various scoring attributes and strict constraints, allowing for a more customized approach that aligns with operational needs. This feature enhances the ability to manage inventory and efficiently meet customer expectations, ensuring that sales orders are fulfilled with the best options available.

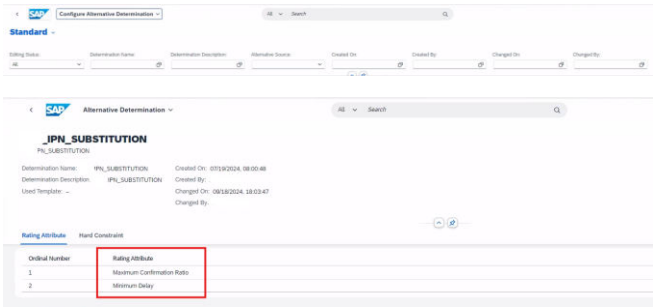

Fig.6. Alternative Determination in SAP AATP

e) Custom Enhancement implementation in the SAP sales order

Class CL_ATP_ABC_PROD_SUBSTN: This class serves as a crucial enhancement to the standard class method ADD_SUBSTITUTIONS utilizing post-exits to improve its functionality. Within an enhancement include, a custom method will be integrated, which is designed to be executed following the completion of the standard method.

The custom method's purpose is to re-sequence the Inventory Product Numbers (IPN) after conducting thorough validations based on the batch shelf life and the date of manufacturing. To facilitate this complex logic, specific custom tables will be utilized, ensuring accurate and efficient processing.

This enhancement specifically targets all standard products encompassed within the standard Advanced Available-to-Promise (ATP) check. The process begins by identifying these products and subsequently validating the existing inventory against the conditions of shelf life and manufacturing dates for the various inventory batches.

One significant contribution of this enhancement is its ability to update the product sequencing to prioritize items according to their remaining shelf life. In the current configuration, there is an established product sequence based on the master planning or standard strategy utilized during the setup of alternative-based confirmations.

However, with this enhancement, products will be re-sequenced after a rigorous assessment of the shelf life of the available inventory. The sequencing process will utilize defined integer values (e.g., 0, 1, 2, etc.) to determine the order of prioritization. Following this re-sequencing, the resulting order will be returned to the standard ATP process, thereby improving commitment reliability, and ensuring more dependable promises to customers. This approach optimizes inventory management by aligning it more closely with the shelf-life requirements of the products involved.

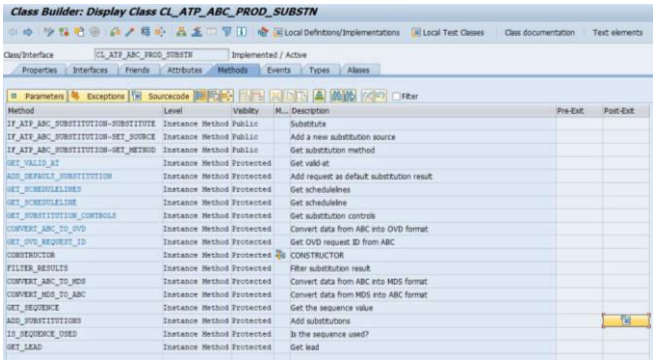

Fig.7.Custom Enhancement code in SAP Sales Order

BENEFITS

1) Real-Time Validation in Sales Orders Based on Shelf Life

The implementation of Advanced Available-to-Promise (ATP) functionality allows for dynamic and accurate validation of sales orders by considering product shelf life. This innovative approach ensures that only the items that meet the necessary freshness criteria are determined to be available for customers to order. As a result, the system effectively mitigates the risk of incorrect shipments and helps companies avoid substantial penalties associated with delivering expired or non-compliant products.

2) Cost Reduction and Enhanced Time Efficiency

By adhering to stringent regulatory compliance through real-time product validation, businesses can significantly decrease instances of shipping erroneous items. This not only protects the company from incurring hefty fines that can arise from non-compliance but also safeguards its reputation with customers.

The real-time ATP process streamlines product determination, which decreases the need to create multiple data records within the system. This reduction minimizes technical debt associated with data management, allowing teams to focus on more strategic tasks rather than rectifying data discrepancies.

Complying with shelf-life and manufacturing date regulations promotes better inventory management and alleviates the issues related to inventory backlog, ensuring that products are moved efficiently through the supply chain.

3) Enhanced Customer Satisfaction Through Reliable and Timely Commitments

By utilizing advanced technologies for processing orders, businesses can provide their customers with accurate and timely commitments regarding product availability. This reliability fosters trust and satisfaction, as customers can depend on receiving their orders as promised—ultimately leading to improved customer loyalty and positive relationships.

CONCLUSION

Implementing product sequencing during the order commitment process will significantly alleviate inventory backlog while ensuring compliance with various regulatory requirements. By leveraging advanced Available-to-Promise (ATP) methodologies, we can provide reliable commitments to our customers. This proactive approach enhances our operational efficiency and strengthens customer trust by guaranteeing timely deliveries and fulfilling their expectations.

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