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Enhancing Order Scheduling Efficiency with Packaging Lead Time in Oracle E-Business Suites Implementation

Srinivasan Narayanan
Milwaukee, Wisconsin, USA

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Abstract: This article deals with the intricacies of packaging lead time requirements in order fulfillment in the Business-to-Business (B2B) context, with different requirements being customer-driven and regulation-driven. The article discusses how Oracle E-Business Suite (EBS) as an integrated ERP package handles order promising processes and how it addresses packaging requirements on domestic and international shipments. In the B2B context, customers need materials shipped in particular types of packaging, from generic cartons to specialized packing skids or pallets. As a robust application, Oracle EBS is strongly positioned to address such packaging needs in a diversified manner by sub-applications like Oracle Order Management and Oracle Global Order Promising. The document talks about the setup of packaging specifications in Oracle EBS using common lookups, descriptive flexfields (DFF), and workflows within Oracle Order Management. Order line workflow customization and defaulting rules are also dealt with in the document to further optimize the order promising process, presenting an end-to-end solution to simplify operations. Finally, the paper outlines Oracle EBS benefits in order fulfillment automation, compliance assurance, and customer satisfaction improvement. It highlights the important part that technology plays in coping with the intricacies of contemporary manufacturing and supply chain management and presents Oracle EBS as a central facilitator of operational excellence and long-term business expansion. As a whole, this journal presents a complete image of the dynamics of packaging lead time demands in the B2B model and the important role played by Oracle EBS in mitigating these challenges.

Keywords: Global Order Promising, Oracle ATP, Oracle EBS, Order Scheduling, Shipping.

1. Introduction: Order Scheduling is a critical communications tool that helps balance customer demands with Organization's ability to fulfill that demand [4]. Order scheduling is managed differently from company to company. Some may place demand for a product at order entry and reserve it upon release. Others places demand a product and promise it to customers at order entry. Still other companies may place demand and promise a product at order entry but, because they have high inventory levels, do not need to reserve the product at release. Oracle Order Entry/Shipping accommodates a range of these scheduling practices. In each scenario, Order Promising calculates and populates the Schedule Ship Date on the sales order line—this is the date on which the order is expected to be picked for shipping, if finished goods are available [1], [2]. On this date, the finished goods should be physically shipped out. However, in practice, physical shipment takes some lead time after pick releasing of order line to package and label goods, arrange for transportation, or perform quality checks before shipment. This period is known as **Packaging Lead Time**, which can range from one to several days depending on the customer, product type, or regulatory compliance.

Currently, the Oracle EBS system does not account for Packaging Lead Time during the scheduling process. As a result, the system may calculate inaccurate Promised Dates, Schedule Ship Dates, and Delivery Dates, leading to missed commitments and negatively impacting on-time delivery metrics and customer satisfaction.

The objective of this paper is to outline a custom solution that incorporates Packaging Lead Time alongside part and assembly lead times into the order fulfillment process for both domestic and international shipments. By doing so, organizations can provide more accurate and realistic order promises, meet delivery commitments, and improve overall customer satisfaction.

2. Solution Approach

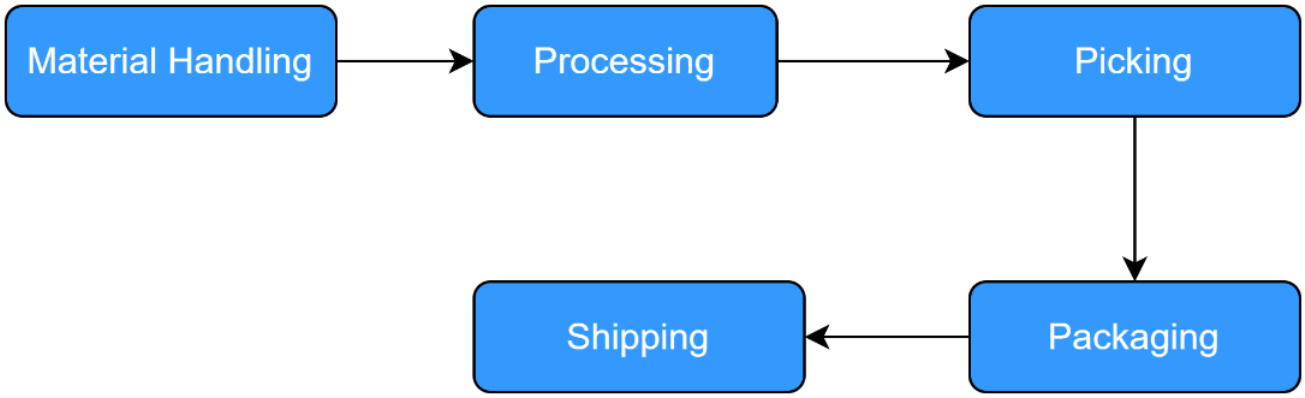

Figure 1: Packaging Process in Manufacturing

Figure 1 illustrates the schematic representation of the packaging process in the manufacturing industry. The packaging requirements of finished products for international shipping are more complex compared to domestic shipping due to the added complexities of longer travel time, varied environmental conditions, and compliance with international regulations. In international shipping, packaging must provide more protection to save products from moisture, temperature, and physical shocks during the lengthy travel covering multiple regions. Furthermore, international shipments necessitate more extensive documentation and marking, such as country-of-origin marking, adherence to customs regulations. These activities take two or more days depending on the packaging requirements.

Conversely, domestic deliveries have shorter delivery durations and fewer regulatory concerns. Though protection remains a high priority, the packaging needs are less extreme. Domestic shipping is more a matter of getting products to their destination safely with handling instructions but without the complication of cross-border regulations. So, lead time for domestic

shipment packaging is less than international.in both the cases we need to have an option to capture this lead time as part of order fulfillment process.

To accomplish this, we will offset the Customer Request Date (CRD) by the Pack Lead Time and pass the offset CRD to ATP prior to scheduling through an ATP hook. This does not change the initial CRD on the sales order line, and data integrity is preserved. Therefore, ATP will return a Scheduled Ship Date (SSD) for the modified CRD, which will be earlier than the original customer-requested date. Although the SSD is before the CRD on the sales order line, the order will ship to meet the CRD. Finally, we will balance out the Promise Date by including the Pack LT in the SSD so that ensuring the customer receives a realistic delivery date accounting for the packing lead time and preparation of shipping documents.

Oracle E- Business Suites (EBS) stands as a prominent ERP application for managing such a business operation. This paper describes the process mapping within Oracle EBS addressing two facets of this requirements:(a) Offset the Customer Requested Date with packaging Lead Time to get earlier Scheduled Ship Date possible, and (b) Offset the Promise Date by adding packaging Lead Time to Scheduled Ship date so that sales order can be shipped on time as promised to customer.

3. Configuration:

Configuration consists of the following components:

1. Capturing Packing Lead Time of The Products using Lookup

2. Sales Order Line DFF to store the days offset value

3. Site Level Profile Option to govern the use of Pack Lead Time

4. Oracle Available to Promise (ATP) API Customization to invoke Scheduling with Modified Request Date

5. Create Defaulting Rules to populate 'Promise Date' (OU Specific Change)

3.1 Capturing Packing Lead Time of the Products

By leveraging Oracle Order Management, Oracle Inventory applications, and Oracle Global Order Promising businesses can effectively map and implement the packing requirement, ensuring timely delivery of products to customer. Packaging days are mapped to sales Order line type. It is the combination of country of destination and product categories.

To store packaging days for different sales order line types, you can utilize the "Order management Lookups". It allows for the capture of specific settings for each sales order line types.

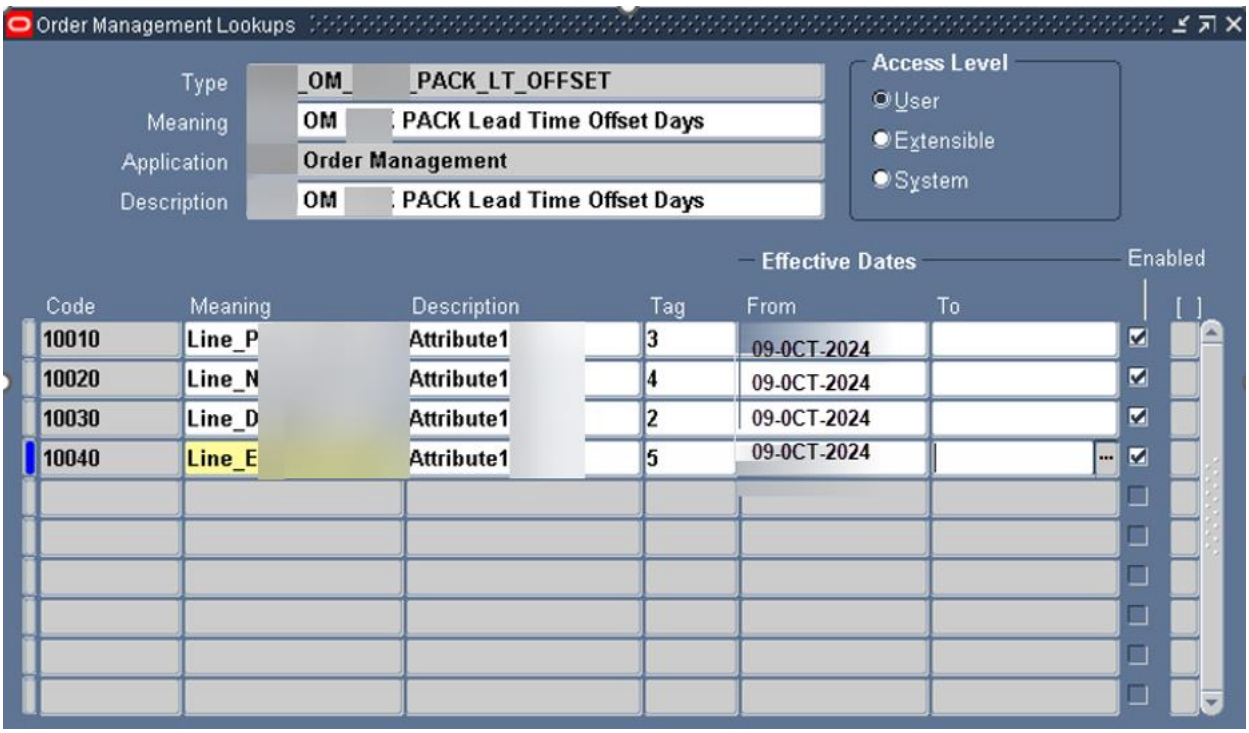

Figure 2: Order management Lookup to store packaging days for Line Types

The Order Management lookup setup is illustrated in Figure 2, with a breakdown of the required fields provided below.

Header Level:

Type: Name of the lookup in upper case which will be added to the code

Meaning: Explanation of the lookup name

Application: denotes the application the lookup owned by

Line Level:

Meaning: Capture the Sales Order Line Type

Description: Attibute1 (Specifies the Attribute in the sales order line table to store packaging days)

Tag: Indicates the number of days Required for Packaging

Effective dates: Enter from date. Line can be end dated when it is no longer in use

Enabled: indicates whether line is Active (Checked or Unchecked)

3.2 Sales Order Line DFF to store the days offset value

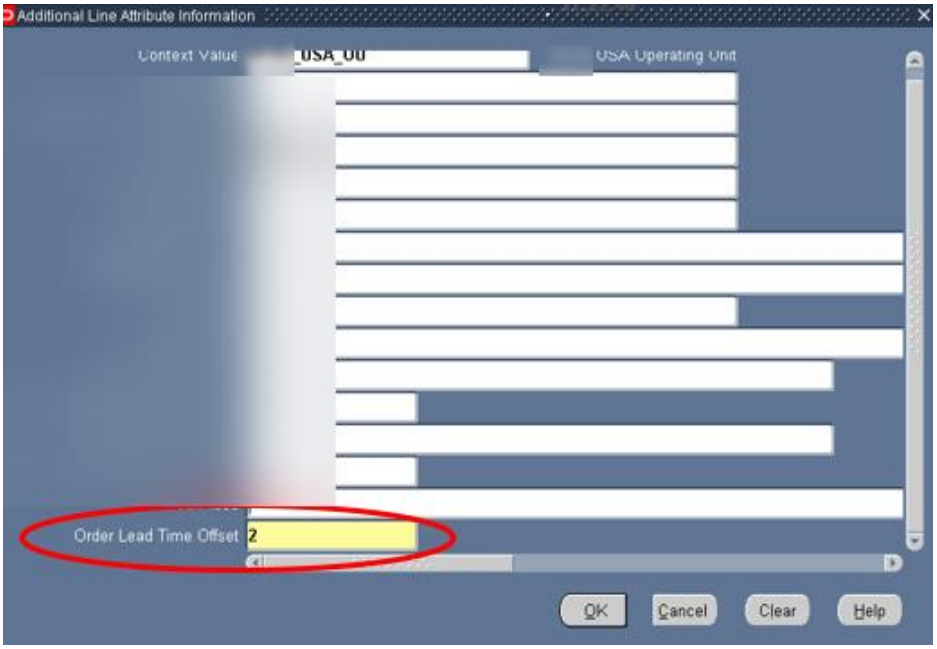

Figure 3: Sales Order line DFF 'Order Lead Time Offset' to store packaging days

As shown in Figure 3, Lead Time Offset Days can be calculated and populated in the Sales Order Line DFF [1] via a custom concurrent job, an extension, or manual entry, as described below. The business can choose one or more of these options, depending on factors such as sales order volume, order entry mode, and the type of order scheduling method used.

a) Develop Custom Program (Job) to populate SO Line DFF With Default offset days.

This program is designed to be scheduled in the same manner as the 'Schedule Order' program and must be set up separately for each Operating Unit (OU). It identifies all Sales Orders within the specified OU that have an unpopulated Order Lead Time DFF. For each of these orders, it examines the Order Line Type and checks for a corresponding entry in the Pack Lead Time Offset lookup table. If a match is found, the program retrieves the associated number of days from the lookup and updates the Order Lead Time DFF on the Sales Order Line accordingly. This program should be scheduled from the OM Responsibilities and must run prior to each execution of the 'Schedule Order' program.

b) Modify the Sales Order Line Workflow and add node in to calculate and populate the offset day. The node to

calculate and populate the DFF will be placed before scheduling event on the workflow.

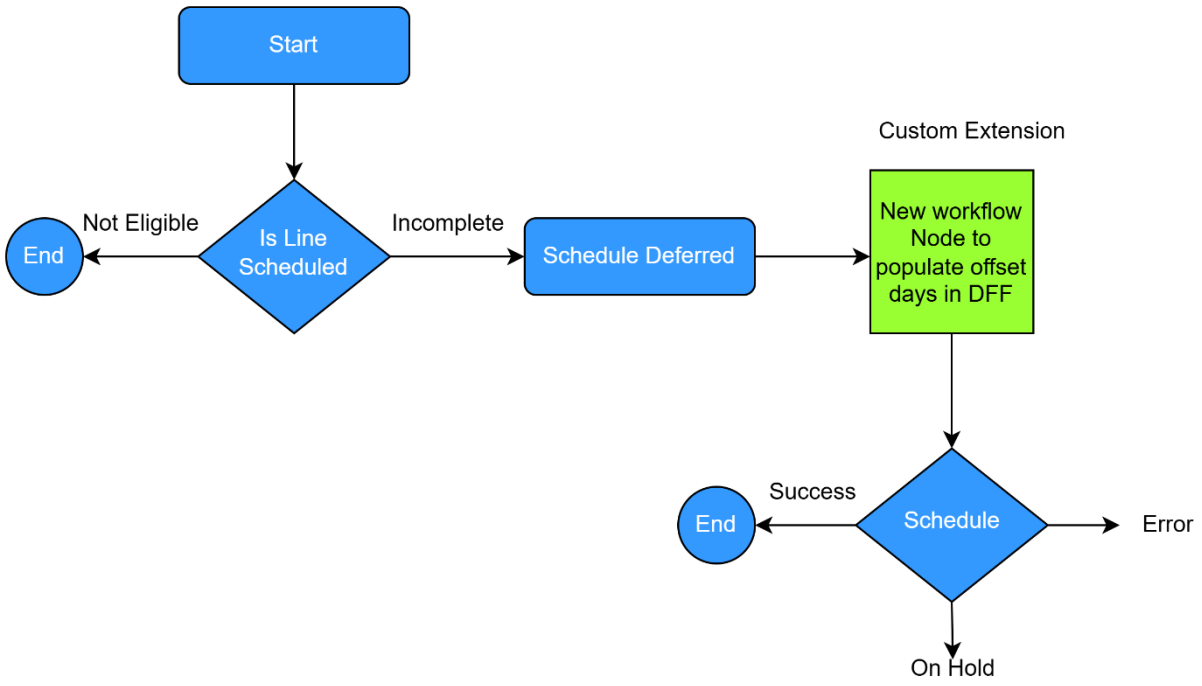

Figure 4: Sales Order 'Line Flow – Generic' Workflow [1]

As shown in Figure 4, sales Order line Flow – Generic workflow can be customized to get offset days and populate in sales Order Line DFF.

c) Modify the Order Import Code to calculate and populate DFF when the Sales Order is imported from an external system. When a sales Order is imported from External system, you can create your own version of Order Import program and include a logic to calculate and populate Lead time Offset value in sales order DFF.

d) Train the Order Entry personal to populate/override the DFF with desired days manually. When the sales order is manually entered. Order entry person can enter, or override system defaulted offset values in the sales order line DFF.

3.3 Site Level Profile Option to govern the use of Packaging Lead Time

When introducing a customization, Oracle recommends using a profile option to govern the functionality, so that it can be easily turned off in case of an issue. In line with Oracle's recommendation, the Packaging Lead Time functionality can be controlled using a profile option [3].

Profile Option Name: XXOM_Use_Pack_LT_Offset

Possible Values: Yes / No

This profile controls the use of the Packaging Lead Time offset functionality at the instance level. If the profile is NULL or set to No, the offset functionality is disabled, and ATP operates as designed by Oracle. If the profile is set to 'Yes,' the system will attempt to offset the Customer Request Date and schedule the order using the offset days for Packaging lead time.This profile is set at the site level and cannot be modified for individual divisions or manufacturing organizations.

3.4 Oracle Available to Promise (ATP) Application Programming Interface (API) Customization to invoke Scheduling with Modified Request Date

Oracle Available to Promise (ATP), is a subset of Global Order Promising in Oracle EBS, performs order promising based on the output of the Oracle Advanced Supply Planning (ASCP) 'Schedule Ship Date is calculated based on Supplies, Demands, Lead Time and other constraints. The order entry and planning systems can either be on the same server (Centralized) or on two separate servers (Decentralized). This solution is compatible with both configurations.

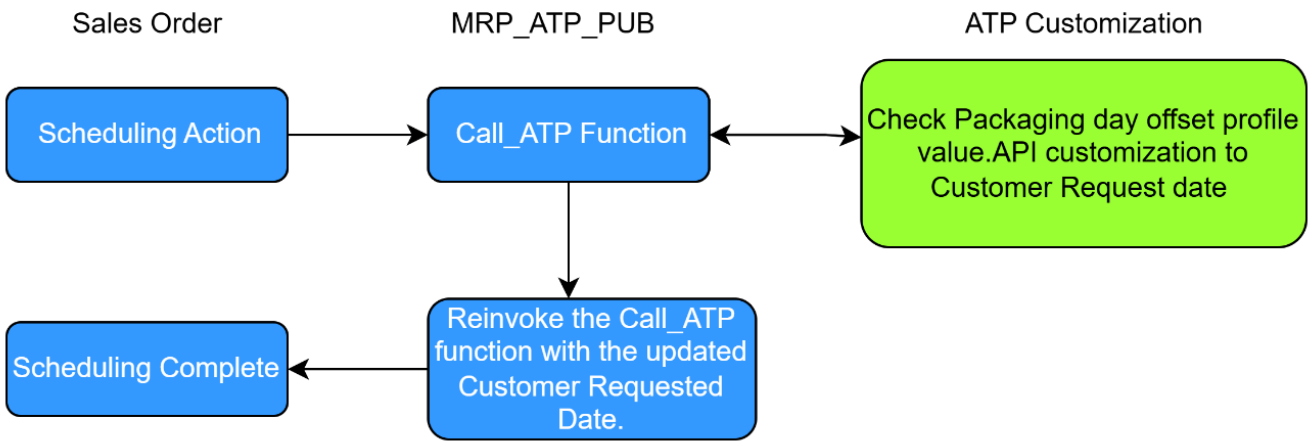

Figure 5: Sales Order Scheduling with customized ATP processing

The Sales Order Line DFF should be populated with the offset days value, and this logic must be applied before the Sales Order Line flow reaches the Scheduling Node during the processing stage.

In the Scheduling stage, the ATP API is triggered. As shown in Figure 5, a custom hook should be introduced during the internal processing of the API to adjust the Customer Request Date (CRD) before the ATP engine is triggered. The modified CRD will be passed to the ATP Engine, allowing for better material and resource availability checks, which in turn results in an improved or earlier Scheduled Ship Date.

Logic:

1. The first API called during ATP processing will be **MRP_ATP_PUB** from Order Management.
2. When a Scheduling Action is performed, it triggers **MRP_ATP_PUB**, which in turn initiates the **Call_ATP** function.
3. A custom logic should be added within the Call to **MRP_ATP_PUB** to modify the Customer Request Date (CRD).

   Steps to Modify CRD:

   - Calculate the modified CRD by applying the offset days:
     p_atp_rec.Customer_request_date = p_atp_rec.Customer_request_date – packaging Offset Days.
   - Pass the modified CRD to ATP to obtain the Scheduled Ship Date.
4. Reinvoke the ATP API, which will now return the Scheduled Ship Date based on the modified Customer Request Date. The remaining processing steps will proceed as usual. Figure 6 offers a detailed visualization of the overall data flow.

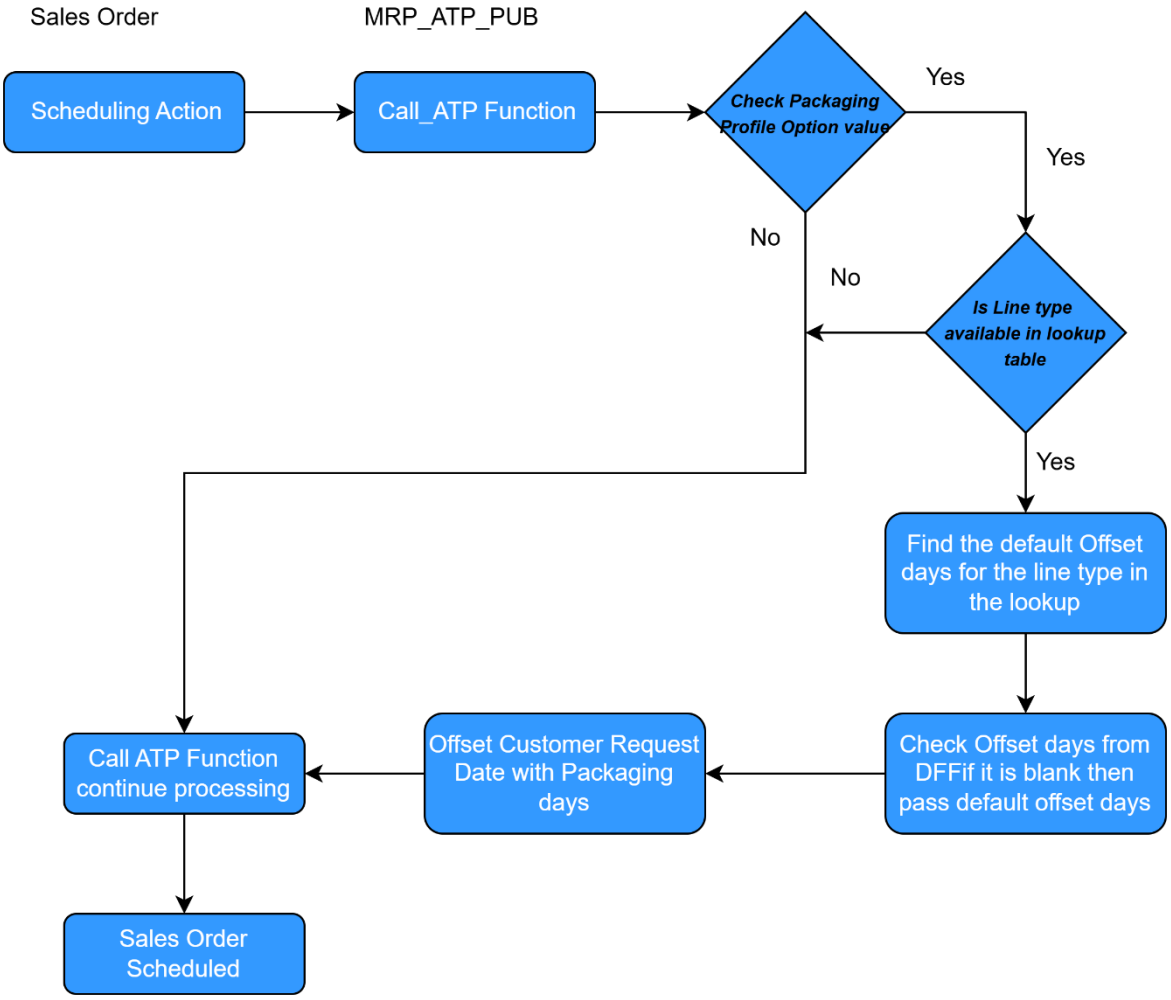

Figure 6: Sales Order Scheduling with customized ATP processing data flow in detail

3.5 Create Defaulting Rules to populate 'Promise Date' (OU Specific Change)

The last step in this solution is to provide realistic Order promising date which includes packaging lead time to customer. This can be achieved through defaulting rule configurations in Oracle EBS. Defaulting rules will be created to automatically populate the "Promise Date" in the sales order line, improving the accuracy and efficiency of order processing. This rule is setup and controlled at Operating Unit (OU) level.

Operating Units intending to use the packaging lead time solution must update their OM System Parameters Promise Date Setup [1] to 'Manual,' as illustrated in Figure 7.

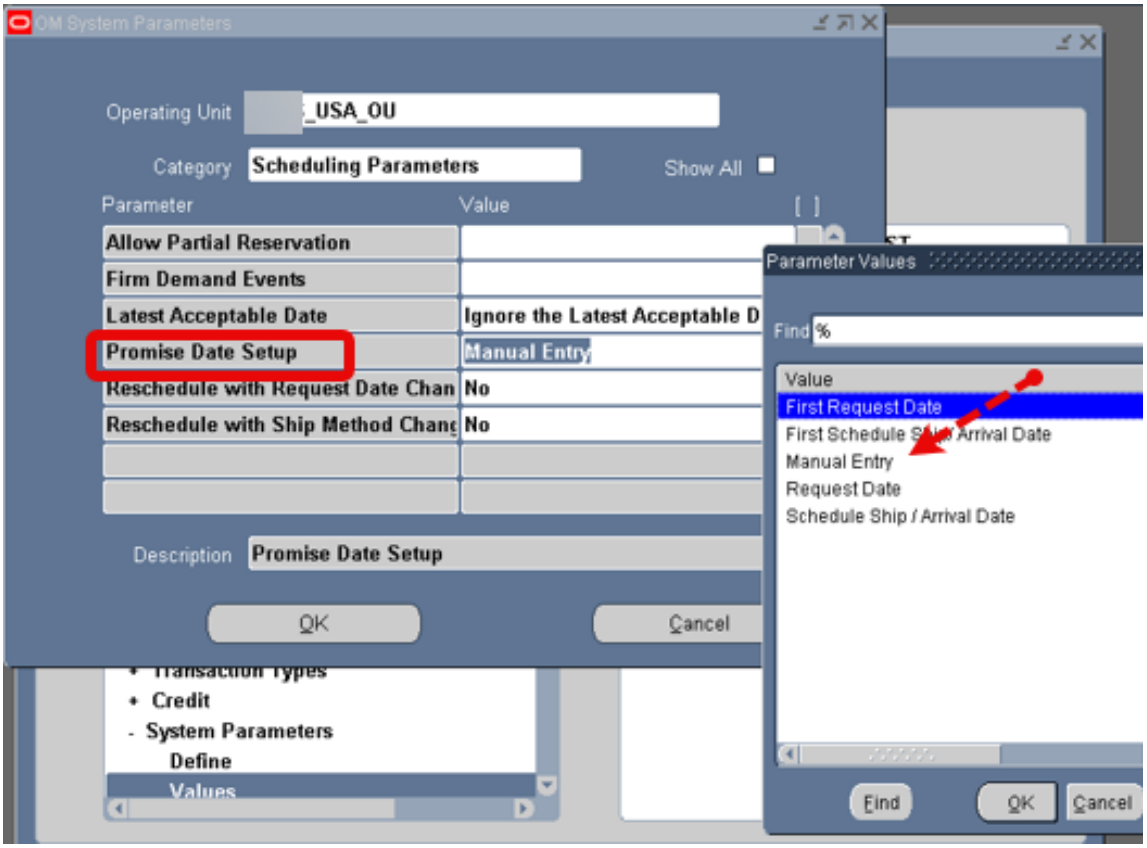

Figure 7: Om System Parameters for Promise Date

As requirement is to default the Promise date with Packaging Offset Days + Schedule Ship Date (SSD), While scheduling line, defaulting needs to be called for Promise date. For that Promise date must be dependent on one/any of the scheduling attributes. But unfortunately Promise date is not dependent on any scheduling attribute. So, we create dependency in oe_dependencies_extn package.

write custom pl/sql package for API xx_OM_Def_Promise_Date to add offset days in DFF to SSD and populate Promise Date. This custom package will be referenced in the Order management Defaulting Setup [1] under Entity Attributes for Promise Date, using a Default Source rule type defined as a PL/SQL API, as shown in Figure 8.

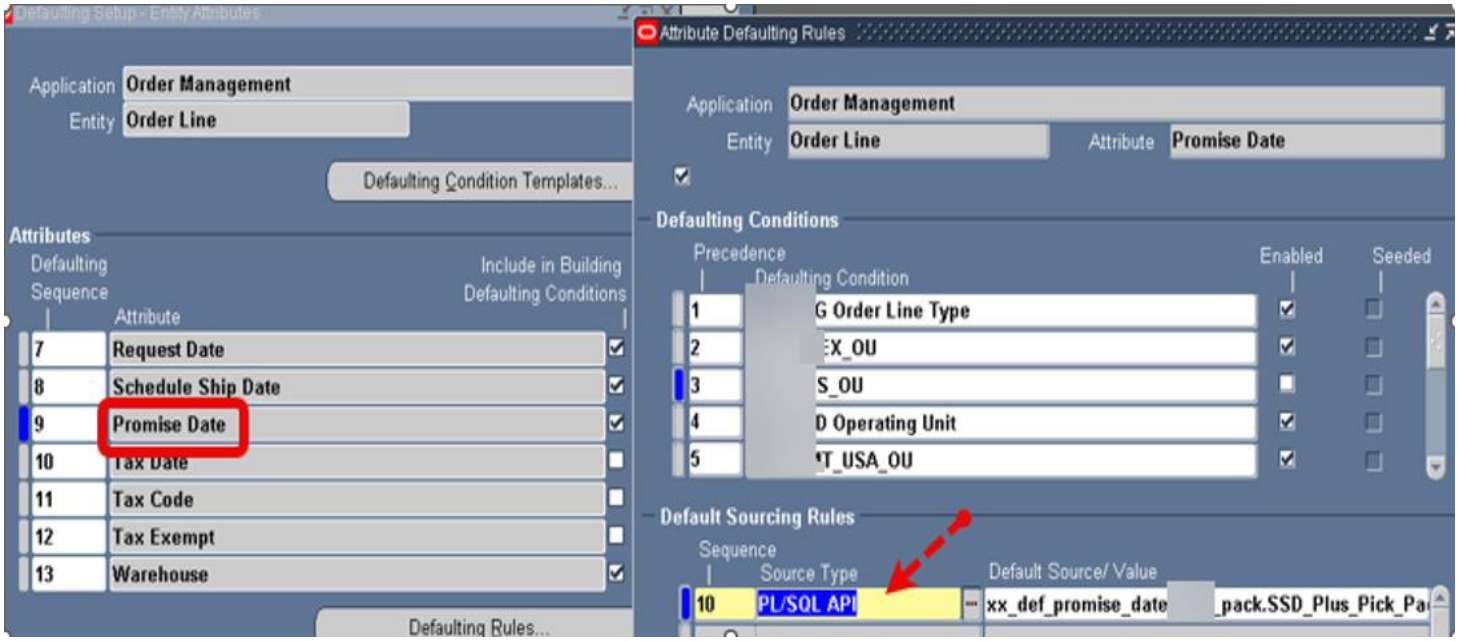

Figure 8: Promise Date Entity attribute setup with custom pl/sql package

4. RESULTS

In this section, we will examine the impact of the order fulfillment process with and without packaging lead time on both Make-to-Stock and Make-to-Order businesses.

4.1. Make To Stock (MTS):

Assumptions:

- Current date: December 1, 2024
- Packaging lead time offset: 2 days
- The ordered item is available in inventory

Profile Option XXOM_Use_Pack_LT_Offset is Turned On

Scenario	Customer Request Date (CRD)	Modified Customer Request Date (MCRD)	Schedule Ship Date(SSD)	Promise Date(PD)	Actual Shipment Date
CRD in the Past /Current date*	29-Nov-24	27-Nov-24	1-Dec-24	3-Dec-24	3-Dec-24
CRD in future	10-Dec-24	8-Dec-24	8-Dec-24	10-Dec-24	10-Dec-24

Profile Option XXOM_Use_Pack_LT_Offset is Turned Off

Scenario	Customer Request Date (CRD)	Modified Customer Request Date (MCRD)	Schedule Ship Date(SSD)	Promise Date(PD)	Actual Shipment Date
CRD in the Past /Current date*	29-Nov-24	NA	9-Dec-24	9-Dec-24	11-Dec-24
CRD in future	10-Dec-24	NA	15-Jan-25	15-Jan-25	17-Jan-25

* ATP cannot commit to dates in the past; it can only promise dates on or after the current date, based on the existing supply and demand picture.

4.2 Make To Order (MTS) :

Assumptions:

- Current date: December 1, 2024
- Packaging lead time offset: 2 days
- The ordered item is not available in inventory

Profile Option XXOM_Use_Pack_LT_Offset is Turned On

Scenario	Customer Request Date (CRD)	Modified Customer Request Date (MCRD)	Schedule Ship Date(SSD)	Promise Date(PD)	Actual Shipment Date

CRD in the Past /Current date*	29-Nov-24	27-Nov-24	9-Dec-24	11-Dec-24	11-Dec-24
CRD in future	12-Dec-24	10-Dec-24	13-Jan-25	15-Jan-25	15-Jan-25

Profile Option XXOM_Use_Pack_LT_Offset is Turned Off

Scenario	Customer Request Date (CRD)	Modified Customer Request Date (MCRD)	Schedule Ship Date(SSD)	Promise Date(PD)	Actual Shipment Date
CRD in the Past /Current date*	29-Nov-24	NA	9-Dec-24	9-Dec-24	11-Dec-24
CRD in future	10-Dec-24	NA	15-Jan-25	15-Jan-25	17-Jan-25

* ATP cannot commit to dates in the past; it can only promise dates on or after the current date, based on the existing supply and demand picture.

4.3 Inferences

For both Make-to-Order (MTO) and Make-to-Stock (MTS) business models:

- As shown, the Scheduled Ship Date improves because the adjusted Customer Request Date is passed to ATP. The Promise Date is then determined by adding the packaging lead time to the Scheduled Ship Date.
- Sales orders are shipped after the promised date thereby missing on-time delivery metrics, when packaging lead time is not considered in order promising and shipping calculations.
- Sales orders are shipped as promised to the customer when packaging lead time is factored into order promising and shipping calculations.
- The results clearly demonstrate that including packaging lead time in the order fulfillment process enhances transparency in order promising and supports achieving delivery metrics across different manufacturing models.

5. Benefits of Using This ATP Enhancement:

- Transit lead time, defined in the Shipping Network, is incorporated into initial scheduling for Transfer Orders and Intercompany transactions.
- The Scheduled Ship Date is calculated based on Available to Promise (ATP) results.
- The Customer Request Date on the Sales Order Line remains unchanged.
- ASCP is driven by the Scheduled Ship Date.
- The solution supports deployment across organizations using profile or organizational parameter controls.
- The ATP logic is triggered each time ATP is invoked from the Order Management module.

6. CONCLUSION

In Summary, the evolving business scenario today brings to the foreground the necessity of providing accurate order promising dates, especially in the Business-to-Business (B2B) scenario, where products are transported worldwide. Oracle E-Business Suite (EBS) is an important ERP solution that manages the

whole order fulfillment cycle in an efficient manner by considering packaging lead time and supply chain constraints. Since packaging is the final process in manufacturing, it can be quite a number of days depending on customer need and regulatory compliance. Oracle EBS is perfectly integrated with other sub-applications such as Oracle Order Management (OM), Oracle Advanced Supply Planning (ASCP), and Oracle Application Developer for automated processes to avoid bottlenecks. Oracle OM, particularly, serves as the base platform for simulation-driven order promising so as to support certain demands through heightened precision and effectiveness. The benefits of this combined solution are significant. With Oracle EBS as the platform, companies can manage the intricacies of contemporary manufacturing, providing operational efficiency, compliance, and customer satisfaction throughout the fulfillment process. This method is particularly valuable in industries such as Engineer-to-Order, Make -to-Order and precision machinery manufacturing, where global shipping is a key consideration. Lastly, Oracle EBS allows businesses to provide realistic promise dates based on evolving packaging requirements, optimize resource utilization, and innovate in supply chain management and manufacturing. As technology continues to evolve, Oracle EBS is always a reliable partner, guiding companies towards operational excellence.

REFERENCES

Oracle Order Management Application Implementation Manual https://docs.oracle.com/cd/E26401_01/doc.122/e48842.pdf

Global Order Promising Implementation and User's Guide https://docs.oracle.com/cd/V39571_01/current/acrobat/122gopug.pdf

Oracle Applications Developer's Guide https://docs.oracle.com/cd/A85964_03/acrobat/115devg.pdf

Seitz, A., & Grunow, M. (2016). Increasing accuracy and robustness of order promises. *International Journal of Production Research*, *55*(3), 656–670. https://doi.org/10.1080/00207543.2016.1195024

Kilger, C., Meyr, H. (2008). Demand Fulfilment and ATP. In: Stadtler, H., Kilger, C. (eds) Supply Chain Management and Advanced Planning. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-540-74512-9_10

CHEN, C., ZHAO, Z., & BALL, M. O. (2002). A MODEL FOR BATCH ADVANCED AVAILABLE-TO-PROMISE. Production and Operations Management, 11(4), 424-440. https://doi.org/10.1111/j.1937-5956.2002.tb00470.x (Original work published 2002)

AUTHOR PROFILE

Srinivasan Narayanan earned his engineering degree from PSG College of Technology, Tamil Nadu, India, in 2001. With over 22 years of extensive experience in IT, he has worked with several Fortune 500 companies across the US, Europe, Japan, and Asia. His expertise spans Supply Chain Management, Material Planning, Manufacturing, Costing, and Maintenance, with a strong focus on various Oracle applications. He is currently working as the Oracle Solution Delivery Lead at Milwaukee Tool in Milwaukee, Wisconsin, United States.