

CHARACTERISTICS- BASED PLANNING WITH SAP INTEGRATED BUSINESS PLANNING (IBP)

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Supply chain planning is undergoing profound transformation driven by several unavoidable factors that are reshaping the industry landscape. Geopolitical influences, such as embargoes, are redefining traditional trade routes and impacting sourcing strategies. The global commitment to sustainability, especially achieving net-zero carbon emissions, compels industries to modify their operations to align with environmental objectives. Additionally, regulatory requirements and certification standards are intensifying, necessitating greater compliance and adaptability from businesses. All these factors drive the need for a more advanced planning solution capable of accounting for critical characteristics such as quality grade, country qualifications, shelf-life, certificates, emission profiles, and more. This evolving need led us to collaborate with SAP for industry-specific Characteristic-Based Planning (CBP) innovations within SAP Integrated Business Planning (IBP), specifically tailored for applications in the life sciences and process manufacturing industries.

Planning Challenges

There are many factors which create a large complexity for the supply chain planning in the life sciences and process industries, among them:

- **Regulatory and safety compliance:** Supply chain planners must navigate the intricate web of regulatory and safety compliances across various manufacturing layers and suppliers. This involves ensuring that every step of the manufacturing process meets both local and global quality, regulatory and safety standards. However, due to the complexity of these requirements, planners often resort to using offline, time-consuming and error-prone spreadsheets to manage these tasks.
- **Change Control:** Open change controls, along with their time-sensitive nature, add complexity to the planning process. For example, a manufacturing method or production line may be qualified in some countries, while approval in other countries is expected after a certain month. The planning solution must consider these time-dependent change controls and formulate a corresponding plan.
- **Quality assurance:** Production needs to meet strict quality criteria; individual batch quality is in many cases only known at the time of the actual quality inspection. The exact batch quality in terms of its potency or purity cannot be fully predicted. The planners keep very high levels of safety stock to manage this uncertainty.
- **Product complexity:** the planners face significant planning complexity due to diverse product portfolios, which encompass various formulations and dosages. For example, the variability in active pharmaceutical ingredients (APIs) and excipients further requires precise formulation. Moreover, advances in personalized medicine and biologics add another layer of complexity, as they necessitate customization to meet individual patient needs effectively.
- **Customer expectations:** Within the industry, there are more diverse and individual customer requirements on top of the mandatory and regulation standards. Also, planners must be agile enough to adjust plans quickly and efficiently to meet the fast response times of customer orders and inquiries, without compromising quality.
- **Risk mitigation:** Planners must manually consider the impact of regulatory uncertainty like product approval. Rapid innovation demands integrated risk assessments to manage high costs and uncertain outcomes, while safety inventory levels must be strategically planned across supply chain nodes to accommodate uncertainties. Also, material distribution must account for remaining shelf life to mitigate the risk of product expiration.

These conditions and variations can be represented in the form of demand and supply characteristics (attributes). The specific requirements of individual customers or markets can be represented at the level of granularity at which the demand forecasting process is performed. Sales order can include the same level of detail and be consequently used in the sales and distribution process to automatically determine the batches which can be used for delivery (while considering customer specific criteria).

The supply planning process, on the other hand, is normally performed at a more aggregated location and product level. Generating a forward-looking supply plan with the standard planning algorithms considering the relevant criteria for exact demand and supply matching therefore becomes a challenge. It can be partially offset by increasing the number of master data records to account for each product variation and planning condition. But this can easily lead to an exponential growth of SKUs, the associated BOMs, master recipes and other master data elements, which in turn makes the company data governance process very difficult and costly to manage.

The Solution

Characteristics-based planning enables supply chain planning by considering various demand and supply attributes. The algorithm balances demand and supply with a level of detail that extends beyond basic location-product planning to include specific defined attributes, such as country qualification, origin, certificate requirements etc. This functionality is available only within order-based planning areas that employ a flexible master data model, utilizing real-time integration. The following configurations are necessary to activate this solution:

- **Attribute Sets:** The functionality works based on creating and marking attributes as type CBP which are to be considered by the CBP planning engine. These are categorized in logical groups, which are called attribute sets and need to be marked as either demand or supply relevant (or both) and also if they will be used for source of supply selection. These sets are assigned to the ATTRIBUTESET in the product master data in IBP and to be equivalently created in the ERP system to allow order level integration.
- **CBP Profile:** The next step is to define the so called CBP profile – i.e. the set of rules which the planning engine considers during the demand - supply matching, creation and propagation. These can also include rules for alternative supply selection.

- **Attribute Value Combination (AVC):** The AVC (in combination with Source Group ID) supports the algorithm in selecting the suitable source of supply, whether from the production data structure or transportation lane. It is instrumental in modeling factors such as qualified manufacturing methods, open change control, and country of origin for supplier selection.
- **Planning Algorithm:** CBP planning is supported by finite heuristics. In the planning process, demand and supply are matched based on predefined rules. The system will either peg existing supply according to the demand and supply characteristics or it will create new supply to fulfill any additional demand while still adhering to the characteristic requirements.

It is important to note that certain functionality is not supported with the 2502 release and is planned for future releases. This includes: Shelf life planning with CBP, multi-level selection of the source of supply, safety stock planning with CBP, time dependent rules etc.

The SAP IBP road ([IBP Roadmap](#)) map is publicly available and shares transparency about the innovations planned.

Prerequisites

To make sure your business is ready to adopt the Characteristics Based Planning (CBP) solution, the following requirements must be fulfilled:

Data and Business Readiness:

- Ensuring high-quality data is vital for the successful implementation of the CBP solution. While the necessary data might not be entirely available within a single ERP system, a substantial amount can be sourced from Quality Control and related systems like SAP ICSM, Mediva, Trackwise, and others. Prioritizing the establishment of a strong database for characteristic-related data is crucial, either before or during the implementation project.
- The data (for example change control data) is not always maintained with right quality in the respective systems used. There should be a process which allows the planners to review and correct the data.
- The end-to-end CBP process requires a harmonized and mature plan-to-fulfill process with very clear responsibilities and handover between planners defined.

Technical requirements:

- A license for SAP IBP is required.
- The use of cached order key figures (OKF) needs to be enabled. This is only available if your system runs on SAP HANA Cloud enabled
- For existing IBP customers, additional details can be found in the URL from SAP Help (IBP Help page)

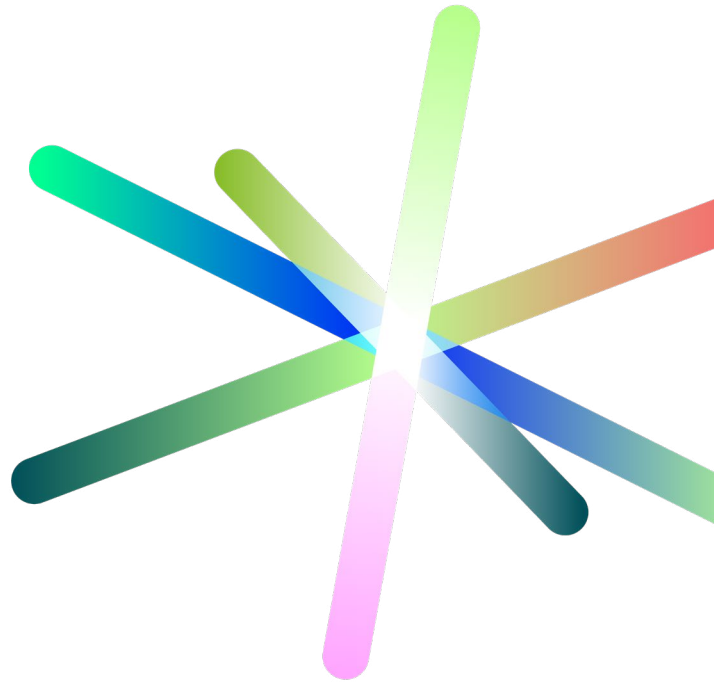
Business Benefits

- **Reduced Safety Stock:** Companies often maintain very high levels of safety stock, such as 6 months' worth in the pharmaceutical industry, partly due to the inherent demand and supply characteristics. CBP provides a strategic approach to managing these complexities, effectively reducing uncertainty at various stages. This enhanced precision in planning can significantly reduce the need for high safety stock levels.
- **Reduced Wastage:** Planning a characteristics level brings additional precision while order creation (for example - right sources of supply/manufacturing methods are selected). This helps in optimum usage of supply/ inventory and hence reduced wastage.
- **Step closure to touchless planning:** All the characteristics are considered by the planning algorithm, requiring fewer manual adjustments by the planner.
- **Reduced Cost:** The sophisticated CBP solution can select the right sources of supply for procurement/production, which improve resource allocation and can reduce costs (like inventory, production)
- **Agility in responding to Market:** Increase in product configuration flexibility allow for faster time-to-Market and improved adaptation to market conditions. The improvement on resource utilization and decision-making by the planners will lower the disruptions and respond efficient to demand shifts

Industry tailored innovation by Deloitte and SAP

As part of our global alliance with SAP, we are continuously innovating together to come up with the best solutions to fulfil the emerging planning requirements of our customers. The solution is being developed in collaboration with a diverse group of early adopter customers, including those from the life sciences and process industries.

1. Key innovation steps in partnership with SAP include:
2. Incorporating customer use cases from a variety of industries.
3. Helping customers outline their CBP project roadmaps and readiness (data/process).
4. Partnering with the SAP team on concept.
5. Performing comprehensive testing.
6. Successfully implementing the solution for our early adopter customers. Curious how Deloitte can help organizations in successful Characteristics based planning journey using SAP IBP, please contact our experts.



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