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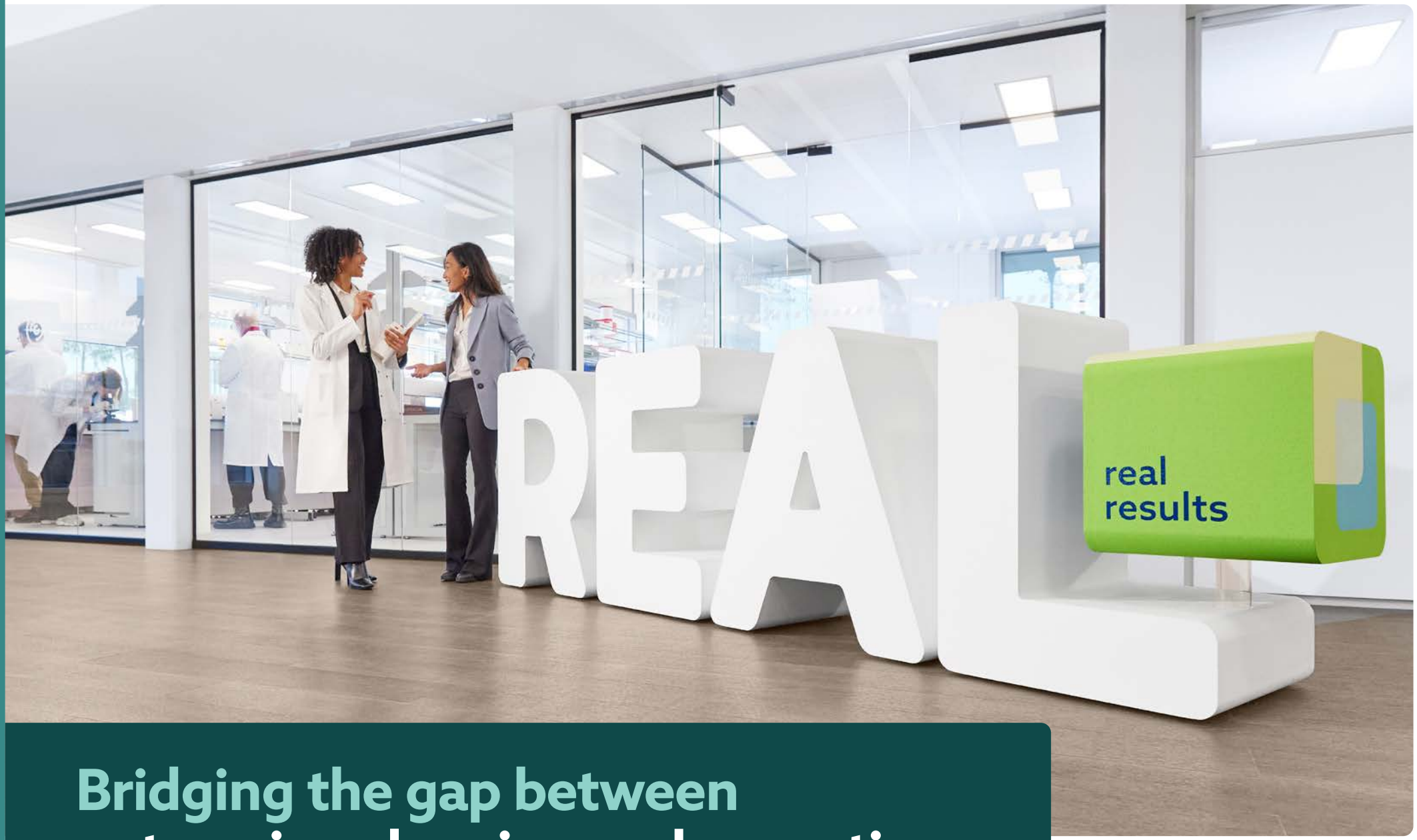


Bridging the gap between enterprise planning and operations

Introduction

Many life science companies have been streamlining their enterprise planning practices in recent years, significantly improving the coordination between demand and supply at a global level. While this builds a strong foundation for strategic and tactical decision-making, there are still **many opportunities to better orchestrate operations across the value chain** for higher overall equipment effectiveness (OEE) and speed of execution.

This e-book discusses the **importance of advanced operational planning and scheduling** for overall performance. We outline how OMP's Unison Planning™ can be leveraged as a complementary solution to enhance local manufacturing efficiency while optimizing operational decision-making at network level. By improving operational agility and responsiveness, it helps manufacturers better synchronize production and demand. Additionally, it streamlines the coordination of shipments and allocations from sites to the market.

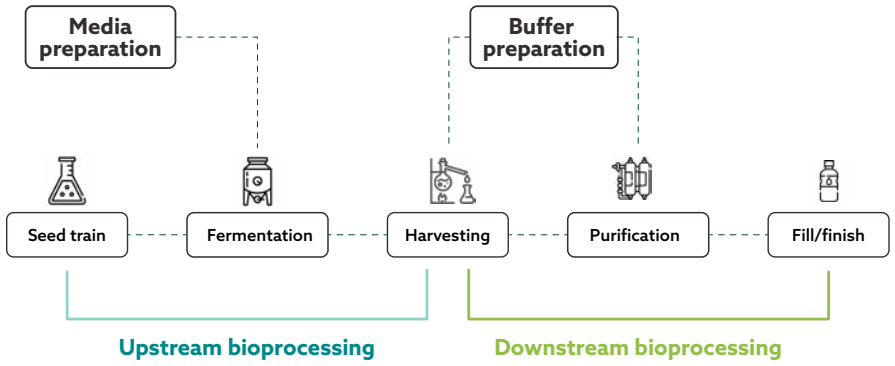
Ready to optimize your operations?

In addition to streamlining demand and supply on strategic and tactical levels, life science companies need to **speed up decision-making and execution** to ensure that the right products are available at the right time in pharmacies, hospitals, and care centers across the globe. This can be done by **streamlining operations at manufacturing sites**, both upstream and downstream.

Let's look at the potential it could unlock.

Incorporate network-level optimization constraints

Plans for producing finished goods need to be operationalized across the entire supply network, from drug substance (DS), active pharmaceutical ingredient (API), and bulk drug product (DP) manufacturing to packaging, labeling, and transportation. If this process relies on spreadsheets or standalone local tools, significant optimization potential goes unrealized.



Upstream manufacturing needs to consider downstream requirements

In biologics manufacturing, upstream fermentation and purification steps must be tightly synchronized with DP formulation to avoid bottlenecks and excess inventory. Similarly, in vaccine manufacturing, antigen production must be dynamically aligned with fill-finish capacity to respond to fluctuations in demand. **Upstream manufacturing** needs to take into account **downstream requirements** to make production more efficient, **align with network-level constraints**, and respond to changes in demand or supply.

Optimize asset utilization and reduce risks

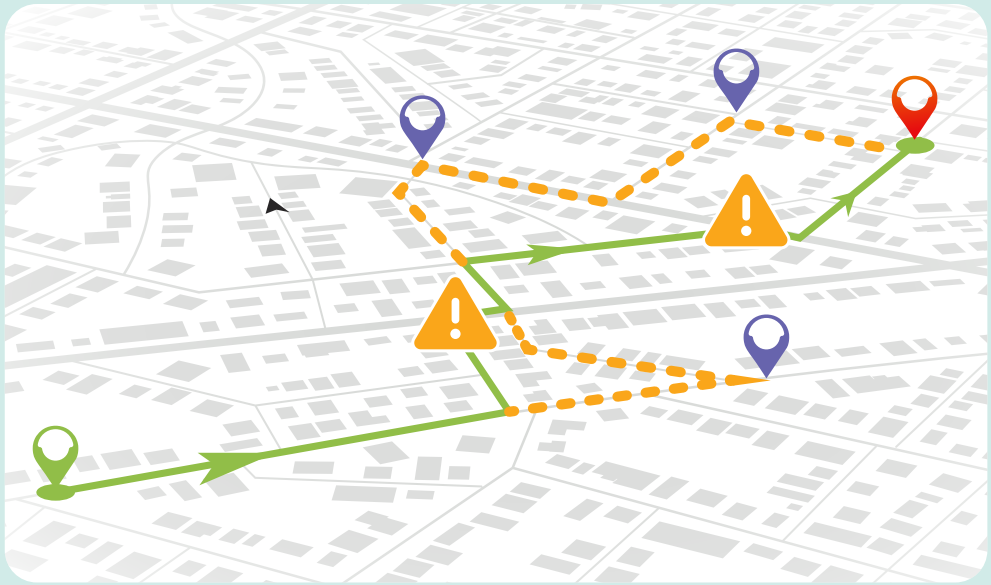
How supply chains perform is significantly improved by **giving planners access to industry-specific planning tools** to optimize production. This includes upstream DS and API, as well as DP in bulk, which involve intricate multi-step processes requiring careful campaign coordination across multi-purpose assets while balancing batch production.

Manufacturing processes must be carefully aligned

In small-molecule API manufacturing, different reactions must be scheduled across shared reactors, making sure that sequencing is optimal to maximize asset utilization while avoiding cross-contamination. In biologics, cell culture and purification campaigns must be aligned to avoid capacity constraints in critical downstream steps like purification and concentration. Without an integrated approach, **misalignment can lead to inefficiencies, underutilized equipment, or bottlenecks** impacting overall supply chain performance.

Boost operational efficiency in a fast-moving reality

Operations in the life science industry must **adapt to shifts in supply and demand**. Unexpected variations in yield, quality deviations, or delays in raw material availability can disrupt production schedules and downstream processes.



Operational planning needs to follow execution system dynamics

Operational planning must align with the dynamics of ERP, MES, LIMS, and other execution systems. Tight integration with these systems allows manufacturers to adjust to changes proactively, just like a GPS reacting to events ahead, by rescheduling campaigns, reallocating resources, and mitigating bottlenecks. This maintains OEE and ensures reliable supply across the value chain.

Align production planning with QC activities

In life sciences, quality control (QC) often accounts for over half of the total lead time of a product. But in many companies, **QC and production work in isolation** from each other because they have a different focus, with QC concentrating on compliance and precision, and production aiming for throughput and efficiency. This siloed approach can create **misaligned priorities and unexpected delays**.

Move to shared visibility and coordinated priorities

When QC and production operate in parallel, without understanding each other's constraints and dependencies, it's easy for one to become a bottleneck for the other. Delays at one side can disrupt planning at the other side. Companies could benefit from synchronizing planning across both areas, aligning lead times, flagging critical paths, and adjusting priorities based on real-time information. This ensures better flow, fewer surprises, and a more resilient supply chain.

Boost your efficiency and speed with Unison Planning™

Integrating best-in-class operational scheduling functionality into the enterprise planning platform has great potential to **increase supply chain performance in the life science industry**.

Here's what OMP's Unison Planning can mean for optimizing upstream manufacturing, fine-tuning short-term deployment planning, and scheduling site operations.

Unison™ PLANNING

Get the most out of upstream manufacturing processes

Advanced planning for DS, API, and DP production manages interdependencies, capacity constraints, and variability.

Multi-step upstream manufacturing can be planned end-to-end, from working cell banks through fermentation, purification, and final DS release. This requires accounting for batch yields, potency variations, and the efficient scheduling of tanks and bioreactors.

Campaigns and lots can be planned on multi-purpose assets, ensuring optimal sequencing and resource utilization while being sized and balanced to align with downstream demand.

Ensuring a steady supply of appropriate DS

In monoclonal antibody production, variations in cell growth rates can impact the timing of downstream chromatography steps, requiring flexible scheduling to prevent bottlenecks. By integrating these factors into operational planning, manufacturers can **optimize resource utilization, minimize waste, and ensure a steady supply** of the appropriate DS.

Enhancing efficiency and reducing changeovers

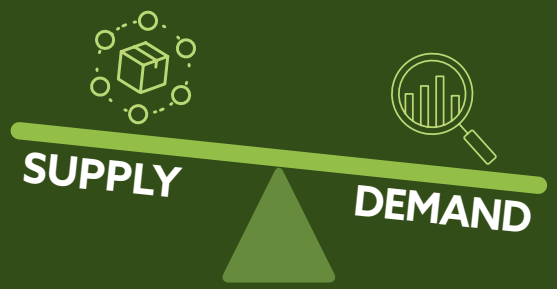
In chemical synthesis, different intermediates may share reactors, requiring careful planning to avoid conflicts and maximize throughput. In vaccine production, antigen campaigns must be synchronized with fill-finish capacity to prevent shortages or excess inventory. By integrating these constraints into operational planning, manufacturers can **enhance OEE, reduce changeovers, and maintain a reliable supply chain.**

Increase manufacturing efficiency and reduce response time

Reality-based scheduling leads to greater manufacturing efficiency and responsiveness, balancing capacities across multiple facilities to produce a globally optimized and feasible plan. Expiration dates, minimum remaining shelf-life requirements, flavor management, and other characteristics are used to **fine-tune finished goods allocation** by taking into account market needs and local constraints, such as regulatory requirements, distribution capacity, and regional demand fluctuations.

Allocating drugs to markets dynamically

In the distribution of a high-demand drug, certain markets may require faster delivery times due to urgent patient needs. Other markets may have limited storage capacity. These factors affect the allocation strategy. By dynamically adjusting allocations in response to such factors, manufacturers can **ensure that products reach the right markets at the right time**, while optimizing supply chain efficiency.



Tune local production to strategic and tactical decisions

While Unison Planning's optimization maximizes local production efficiency, it also considers network-level strategic and tactical decisions.

In addition, the multitude of operational decisions made locally at the level of finished and packaged goods are **aggregated and automatically communicated upstream**. This allows the upstream organization to tune its manufacturing plan for greater OEE and better service.

Aligning operational plans with network-level decisions

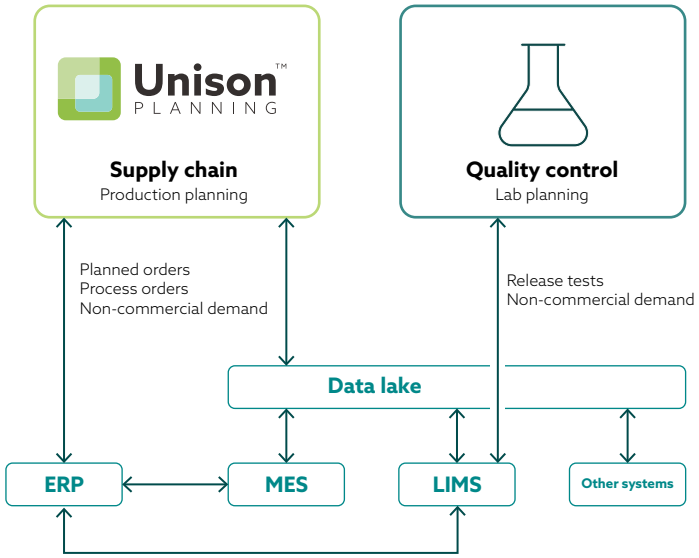
Network-level strategic and tactical decisions in operational planning include site allocation decisions, such as determining which manufacturing sites should absorb specific production volumes based on capacity, location, and regulatory considerations. It also involves setting sourcing quotas to ensure supply continuity and balancing supplier allocation across regions. Inventory policies are established to determine optimal stock levels, reorder points, and safety stock across the supply chain, ensuring a steady flow of products while minimizing excess inventory and obsolescence. These decisions align the supply network to meet demand while optimizing efficiency and cost.

Aligning production with downstream demand

The upstream manufacturing plan can be fine-tuned by aligning production schedules with downstream demand, optimizing resource utilization, and minimizing bottlenecks. This includes adjusting batch sizes, sequencing campaigns to reduce changeover time, and dynamically reallocating capacity in response to variations in supply or market needs.

Synchronize your supply chain and QC planning

Unison Planning allows production to be planned in sync with QC to prevent bottlenecks from occurring. To this end, **Unison Planning provides seamless integration with QC lab planning solutions**.



Allowing QC and production to share their planning information proactively

Unison Planning's QC integration involves a **proactive real-time exchange of critical plan data** between the two planning solutions through a 'handshake integration' in the cloud. This means that whenever a planned handover date from QC changes, a signal is sent to Unison Planning, and the **impacted plans will be re-optimized** — even automatically if the change is within defined boundaries. Likewise, Unison Planning sends a signal to QC whenever a change occurs in the planned handover date to QC. This allows the QC system to adjust schedules accordingly.

Get real-time decision support

Unison Planning seamlessly integrates with ERP, MES, LIMS, and other execution systems as well as with the enterprise planning solution. Frequent data updates (for example, hourly, daily, or shift by shift) are tuned to the business process at hand. This means that **planning decisions remain aligned with real-time conditions**, ensuring that adjustments are made dynamically based on current supply, demand, and operational constraints.

Boost your efficiency and speed with Unison Planning™

In the event of delays in raw material delivery or batch underperformance during manufacturing, **plans can be immediately updated** to reschedule production or reallocate resources, minimizing downtime and avoiding disruption to downstream processes. By continuously monitoring and updating plans, organizations can respond to these changes quickly, ensuring optimal efficiency and meeting customer delivery requirements.

Conclusion

Implementing Unison Planning™ as a complementary solution to enterprise planning tools enhances total planning quality. With this solution, **enterprise-level plans are refined and extended with reality-based operations** and shopfloor execution.

Unison Planning™ **brings greater precision and agility** to manufacturing and supply chain operations by **incorporating real-time data, detailed constraints, and dynamic adjustments** that enterprise planning alone is unable to capture. This ensures that high-level plans are translated into **executable, optimized schedules** taking into account factors like capacity, batch sequencing, materials availability, and regulatory constraints. By **bridging the gap between strategic planning and real-world execution**, Unison Planning improves overall equipment effectiveness, responsiveness, and service levels while enabling a more resilient and adaptive supply chain.

Submit your case

Want to enhance your total planning quality?

Contact us today

About OMP

Hundreds of customers in **a wide range of industries** - consumer goods, life sciences, chemicals, metals, paper, plastics & packaging, tires & building products - benefit from using OMP's unique **Unison Planning™,** an open, cloud-native, and AI-driven platform that embeds our deep **industry expertise** and offers real solutions for the challenges your industry faces.

A proven platform for **all your supply chain planning needs**, from demand to supply, from the strategic to the operational levels.
A **real solution** that supports your journey toward autonomous, decision-centric planning. Built on 40 years of expertise.

Recognized by **Gartner®** for its leadership and vision, OMP helps you navigate supply chain challenges with data-driven insights, dynamic optimization, and sustainable decision-making, delivering **real business value**.

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