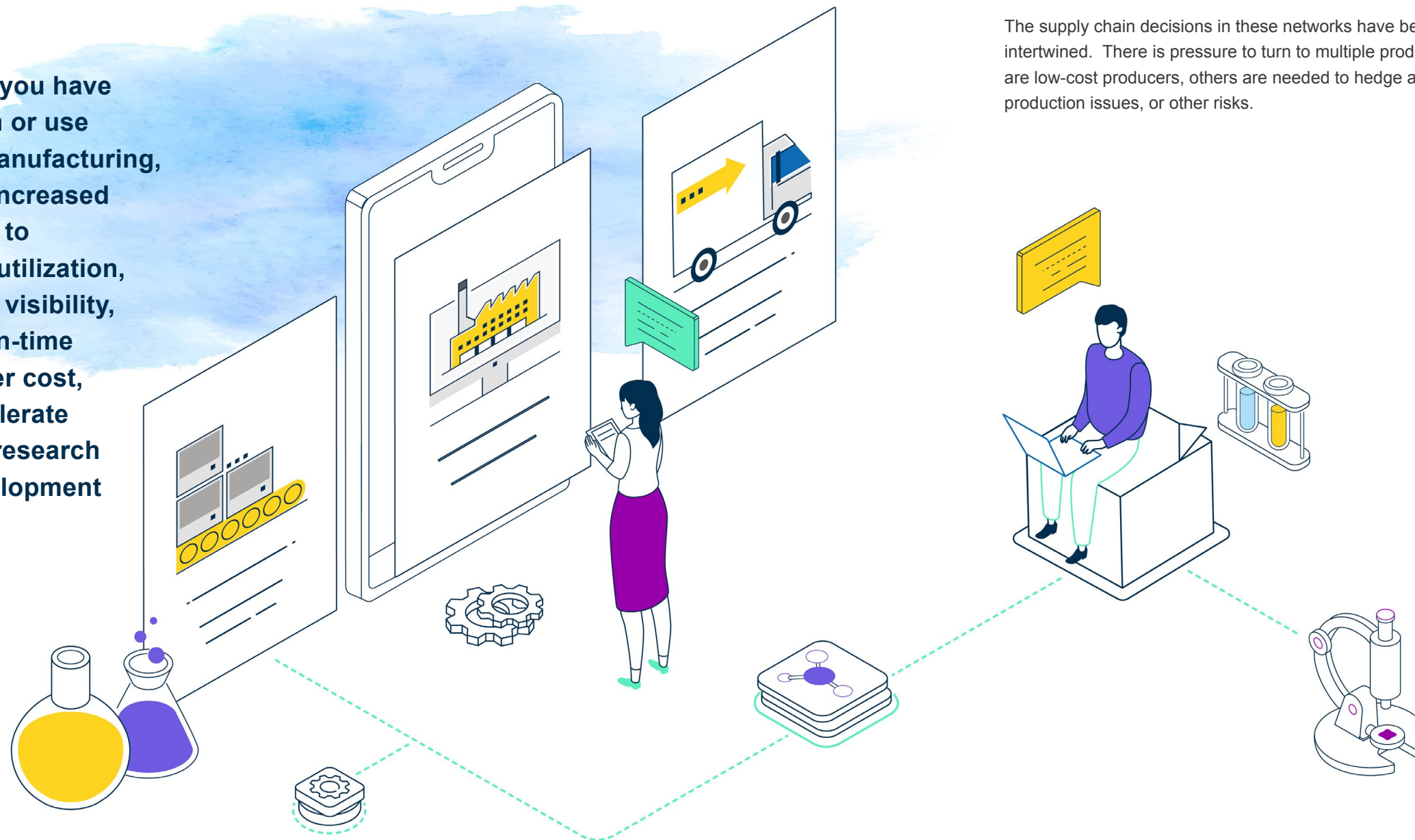# Life Sciences and Chemical Industries

Whether you have your own or use virtual manufacturing, there is increased pressure to improve utilization, gain E2E visibility, deliver on-time with lower cost, and accelerate product research and development cycles.

According to Gartner, the industry suffers from inefficiencies and pressure to reduce cost, including high inventory levels and cycle time waste in the existing product supply model. Even with total inventories as high as 200 to 300 days, 7% to 10% stockout rates are not uncommon. In contrast consumer products industry, supply chain management has reduced total inventory to 60 to 70 days with minimal stockouts.

Life sciences and Chemical industries have to worry about managing increasingly complex multi-stage manufacturing networks that span the globe in order to stay cost competitive.

The supply chain decisions in these networks have become more difficult and intertwined. There is pressure to turn to multiple production sites; while some are low-cost producers, others are needed to hedge against product quality and production issues, or other risks.

Accelerate lead times
Compress planning and production cycles based on greater precision and responsiveness in demand planning and much greater transparency of information throughout your supply chain by forming a true digital twin.

Reduce inventories
Hedge against inaccurate forecasting in volatile markets by making your entire supply chain leaner, more responsive, more reliable; reduce total inventories including raw materials, WIP, model stock Inventories and finished goods.

Consolidate planning
Establish a common language for capturing demand and supply information and feeding decisions directly to varied enterprise and shop floor systems.

Improve capacity utilization
Adexa enables a true digital twin so that the capacity of each equipment is accurately modeled and optimized.

Gain E2E visibility
Deliver better information faster through the "digital supply chain" so trading partners can plan and execute proactively to help you reach your goals.

The system needs to be dynamic enough to monitor the operations and continuously generate accurate long-and short-term *executable* plans in *one unified environment.* Otherwise why bother?

These challenges are driving these industries to need more sophisticated capabilities in managing their supply chains and factories, especially when it comes to protecting their margins.

Smaller companies with innovative products have to rely on low cost contract manufacturers in countries like India and China ensuring compliance and regulatory barriers as well as protection of IP. This makes coordination of R&D and manufacturing and testing heavily disjointed.

In order to squeeze more profit from a tough market, Pharma and Chemical companies need the ability to manage their supply chain network based on the financial impact of every decision.

Any time a new plan is created, the financial impact of the changes must be highlighted and compared to the budgeted plan. If done effectively, a company will be able to quickly and accurately take corrective action and effectively align the whole company to meet market demand at the lowest cost.

Having the above-mentioned capability requires a company to be able to link the areas of Demand Planning, Inventory Planning, Network & Sourcing Optimization, E2E planning and visibility, and manufacturing planning & scheduling combined with financial analysis. Some key points to look for in each of these areas are as follows.

The **Demand Planning** system needs to be able to consolidate the expected demand from the many business units that sell product all over the world. Chemical and Pharma companies sell to many types of businesses, but the resources required to build these products are shared.

This means the Demand Planning system needs to be collaborative, scaled on a worldwide basis, with the ability to predict not just demand, but expected revenue. Accurate predictions are the key to avoiding excess inventory or potential shortages. New products present even more challenges.

Faced with regulatory, testing and the complexity, pharmaceutical companies have unprecedented challenges. Their multi-billion dollar investment in new molecular entities can take years and not guaranteed for approval.

The **Inventory Planning** systems need to be able to set buffer inventory in multi-stage supply chains and determine the necessary inventory required to meet the sales plan.

The ability to predict inventory levels into the future is critical along with the capability to measure the value of the expected inventory over time. Using prescriptive algorithms and ML techniques to predict safety stocks by product and region can be extremely effective in lowering cost and meeting customer demands.

The **E2E Planning** as well as **Factory planning & scheduling** systems need to be capable of taking into account, capacity, key material constraints, production costs, transportation costs and required dual sourcing for contingency management when optimizing the network.

The planning system should be able to differentiate the cost of running the same product on different resources, in order to accurately predict future expected operations costs. Every decision made in planning and scheduling factories should reflect financial consequences. The ability of the system to have accurate representation of the supply chain and factories (i.e. a digital twin) enables true financial projections.

The system needs to be dynamic enough to monitor the operations and continuously re-plan and translate that to execution in one unified environment. After all what good is a S&OP and S&OE unless they are capable of generating executable and optimal plan on an on-going basis?

In the absence of such features, service levels drop, cost increases, unreliable delivery dates are given and inaccurate financials are projected.

"Using Adexa Genies©, eGPS enables building a digital twin of your supply chain and your factories, and continues to self-correct the model and self-improve the policies such as safety stocks."