



ACCELERATE INNOVATION AND RESILIENT SUPPLY CHAINS FOR LIFE SCIENCES





THE CHALLENGES IN FOCUS

The concept of “supply chain management” has been known for decades, but the ability to effectively implement a strategy that meets business goals has been continually challenged, especially since the start of the global pandemic. The unprecedented disruption has shone a spotlight on critical weaknesses that need to be addressed.



SUPPLY CHAIN RESILIENCE:

Even mature organizations were caught off guard. Shortages of material, people and demand led to a complete breakdown of the supply chain in many cases.



RELIANCE ON EXTENDED SUPPLY NETWORKS IN LIFE SCIENCES:

Very few companies have truly vertically-integrated supply chains. Global organizations need to ensure an optimized supply chain to deal with disruption across a global network of raw material suppliers, contract manufacturers and quality testing service providers.



DISRUPTION AS A CONSTANT:

Although minor disruption is perpetual, potential “compounding” disruption was not anticipated. The pandemic impact was historic, but additional events like the blockage in the Suez Canal and Brexit had exaggerated the challenges, and others will follow.



LACK OF VISIBILITY:

Knowing where you are and what is happening across the supply chain in real time is needed to know how to try and course correct. For example, reduction in batch volumes per product due to the personalization of medicines requires easier access to information to monitor quality and to balance complex supply networks under a high degree of regulatory control. Very few companies have the visibility to the overall operational status in order to effectively develop a contingency plan with any confidence.

DELMIA has always been at the forefront of addressing these business challenges and supporting integrated business planning. By enabling customers to model the intricacies of their supply chains and consider the trade-offs between operational and business goals using advanced optimization, we provide unique ways for organizations to weather the storm of disruption and variability and emerge as leaders in their industries.

The path each organization can take in reimagining the supply chain of tomorrow depends on their industry, maturity and goals but it is possible to see some key trends emerge and the changes in thinking and process being considered and adopted.



IMPORTANT SUPPLY CHAIN TRENDS

Responding to the new normal has seen companies undoing previous operational strategies as well as adopting new innovation and technology. Although potentially beneficial, each trend offers challenges to overcome.

Considerations	Supply Chain Trends	Challenges																											
What is the value of re-integrating the supply chain?	<p>Over the disruptive last few years, countries have been focused on ensuring supply within their borders. For example, the Food & Drug Administration (FDA) is monitoring drug shortages and urging manufacturers to develop risk management plans to promote a stronger, more resilient drug supply chain - especially in an age of rising trade conflicts. This focus on building internal supply may also lead to production sovereignty.</p>	<p>Companies still suffer from disparate systems and organization silos.</p>																											
	<div><p>Figure 6 In a recent Kearney survey on reshoring, many executives perceive nearshoring to Mexico or Canada as more advantageous than reshoring manufacturing to the United States</p><p>● Strongly agree ● Agree ● Somewhat agree ● Somewhat disagree ● Disagree ● Strongly disagree</p><table><tr><td>Overall</td><td>9%</td><td>21%</td><td>24%</td><td>21%</td><td>14%</td><td>11%</td></tr><tr><td>Small and medium-size enterprises</td><td>6%</td><td>11%</td><td>24%</td><td>26%</td><td>20%</td><td>13%</td></tr><tr><td>Large companies</td><td>14%</td><td>34%</td><td>24%</td><td>14%</td><td>6%</td><td>8%</td></tr><tr><td>Manufacturers with offshore facilities</td><td>3%</td><td>37%</td><td>34%</td><td>18%</td><td>8%</td><td></td></tr></table><p>(100% = 120 respondents; 70 small and medium-size enterprises and 50 large companies)</p></div> <p>(Source: Kearney 2020 Reshoring Index)</p>		Overall	9%	21%	24%	21%	14%	11%	Small and medium-size enterprises	6%	11%	24%	26%	20%	13%	Large companies	14%	34%	24%	14%	6%	8%	Manufacturers with offshore facilities	3%	37%	34%	18%	8%
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How do “control towers” add value?	<p>As more products in the pharma industry require temperature controlled logistics, visibility is just one of the benefits to using a “control tower”. Waste and the need for quarantine are further drivers for supply chain visibility.</p>	<p>There are still challenges in obtaining and centralizing information to realize the “control tower” capability.</p>																											

<p>How can optimization help?</p>	<p>Optimization and artificial intelligence (AI) are areas that organizations are investigating as a method of automating analysis in complex supply chains so that decision-making can be expedited both rapidly and confidently.</p>	<p>Optimization is a complex discipline and organizations are struggling to determine what the real-world benefits would be compared to the marketing hype.</p>
<p>How to leverage the virtual world?</p>	<p>Digital twins of products and facilities are already a valuable tool, and the same value can be applied to the supply chain. By having a connected model of the end-to-end operations from supplier to customer, organizations can have a unique ability to analyze and experiment with new strategies across the supply chain.</p>	<p>The full realization of this is not a trivial task and organizations are attempting to understand the first steps along the path to this virtual experience.</p>
<div data-bbox="159 752 1430 1489"> <p>EXPECTATIONS</p> <p>TIME</p> <p>Plateau will be reached: ○ <2 yrs ● 2-5 yrs ● 5-10 yrs ▲ >10 yrs ✗ Obsolete before plateau</p> <p><i>(Example of Key Supply Chain Market Trends. Source: Gartner 2021 Supply Chain Planning Hype Cycle)</i></p> <p><i>As of August 2021</i></p> <p>The chart illustrates the Gartner Hype Cycle for Supply Chain Planning. The y-axis represents 'EXPECTATIONS' and the x-axis represents 'TIME'. The cycle is divided into five phases: Innovation Trigger, Peak of Inflated Expectations, Trough of Disillusionment, Slope of Enlightenment, and Plateau of Productivity. Various technologies are plotted along this curve with markers indicating when they are expected to reach a plateau. Technologies like Supply Chain Blockchain, Customer Experience, Digital Security, Supply Chain as a Service, Data Literacy, Digital Supply Chain Twin, Agile Teams, Artificial Intelligence, and Supply Chain Control Tower are in the early stages. Technologies like Supply Chain Cost Optimization, Machine Learning, RPA, Workforce Analytics, Prescriptive Analytics, Environmental, Social and Governance, Predictive Analytics, Supply Chain Risk Management, Metrics, Network Design, SC Segmentation, Cost-to-Serve Analysis, and Digital Supply Chain Strategy are in the later stages. The Center of Excellence is marked on the Plateau of Productivity.</p> </div>		
	<p><i>(Example of Key Supply Chain Market Trends. Source: Gartner 2021 Supply Chain Planning Hype Cycle)</i></p>	
<p>How to combine product innovation with the supply chain?</p>	<p>The move to personalised therapy, especially cell and gene therapies, requires a complete redesign of the supply chain - the patient becomes both a raw material provider as well as a customer. While this example is at the extreme end of the spectrum for the increasing complexity of therapies and pharma products, it illustrates the impact it will have on supply chains.</p>	<p>Having a consolidated vision and technology platform to support this is possible but requires a strategic commitment across the organization.</p>

All these major trends, along with many other initiatives are supporting four overarching goals:

- 1 Visibility
- 2 Traceability
- 2 Agility
- 2 Resiliency

THE ESSENCE OF SUPPLY CHAIN INNOVATION

Organizations must not only survive disruption—they must also thrive and innovate. Here are four fundamental competencies that all future life science supply chains need to achieve.

- ✓ **Visibility to the overall operational status of the supply chain will drastically help manufacturers in the pharma industry to effectively develop contingency plans with confidence**
- ✓ **Traceability for each step of the production and its processes will help companies achieve regulatory compliance and meet the quality expectations for customers**
- ✓ **Agility applies to production processes, workforce and equipment utilization and the decision-making process. It depends upon an understanding of what is happening and evaluating possible plans to determine the best course of action moving forward.**
- ✓ **Resiliency adds an ability to endure disruption and then recover quickly. It also requires understanding and the knowledge to create longer term strategies so that viable options are available when challenges occur.**

HOW DO ORGANIZATIONS BECOME AGILE AND RESILIENT?

These competencies need to be developed through effective application and implementation of people, process and technology. When all three are considered together, organizations can not only provide a foundation for the new normal but also unlock new levels of innovation and develop a truly sustainable business environment.





UNDERSTANDING SUPPLY CHAIN PROBLEMS

Every organization would be supply chain “masters” if the problems were easy to solve, but thanks to the ever-increasing complexity of operations the problems are both numerous and convoluted.



HOW DO YOU MANAGE A DISTRIBUTED VALUE NETWORK OF FACILITIES, SUPPLIERS AND CUSTOMERS?

Within the life science supply chain, there are pharma companies, raw material providers, contract manufacturers and testing labs in between. Each aspect of the network needs to be balanced carefully as they rely on one another. Traceability is crucial across every single step of the process in this chain.



CAN TRADITIONAL TOOLS DEAL WITH TODAY'S PLANNING COMPLEXITIES?

Historically, the pharma industry has operated mostly on paper and continues to do so today. However, with the emergence of new or isolated systems, there is the challenge of integration, which may result in working silos.



WHAT DATA IS NEEDED?

Supply chain plans need to be informed with real-time data from inventory, manufacturing and logistics in order to analyze multiple scenarios and develop feasible action plans that can be made with confidence. Compliance features are also needed within the life sciences industry, such as audit trails, e-signatures and more. This requires connectivity and data input at multiple levels and locations across supply chain operations.



HOW DO YOU COLLABORATE AND INCLUDE THE RIGHT STAKEHOLDERS?

Developing effective supply chain plans means including sales, operations, finance, procurement as well as the executive team. There needs to be an expedient and standardized process whereby the stakeholders can collaborate effectively and inclusively so that all viewpoints and priorities are considered.



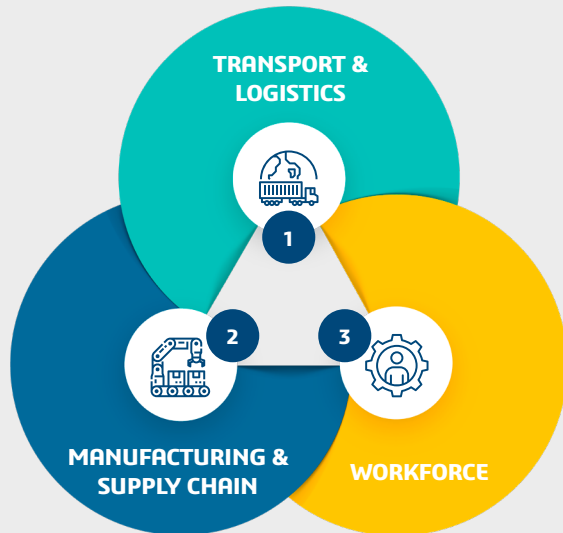
WHAT IF THERE ARE COMPETING COMPANY GOALS?

Traditional supply chain planning has considered typical constraints such as material and capacity, but sustainable business in the new normal means organizations must include operational goals with financial and corporate goals as part of the holistic plan.

There are many other tactical problems that should also be considered and each industry will have unique variations and distinctions. These add to the challenge of finding solutions that can be effectively applied to enable benefit and value.

CRITICAL CAPABILITIES

DELMIA offers robust supply chain solutions that can help organizations in different industries to address the challenges and problems to operate with greater agility, efficiency and operational excellence. DELMIA provides planning, scheduling and optimization for complex integrated business planning processes within supply chain, logistics and workforce operations across all planning horizons.



- 1 Optimize your logistics and transportation network; gain full control over the fleet, align transport with production plans and collaborate more closely with customers across the supply chain.
- 2 Model and optimize your supply chain network performance from inbound supply to manufacturing and distribution. Gain control, visibility and lasting resiliency across your value network.
- 3 Improve staff utilization and employee productivity by striking the right balance between operational efficiency, regulations, and employee and customer satisfaction.

The DELMIA supply chain solution delivers innovation and value with key differentiation:



END-TO-END SUPPLY CHAIN MODELING

DELMIA Planning & Optimization provides optimized planning for operations execution across your entire value network. Taking a holistic but modular approach, DELMIA enables intelligent supply chain planning and optimization for every stage of your supply chain journey and time horizon. Tactical supply chain issues can often be the root cause of missing major business goals: single supplier shortages leading to end product delays or key workforce disruptions delaying product distribution. It's important to model all aspects of the supply chain as the details matter.

Important challenges & trends addressed:



Control tower visibility across extended networks



Evaluating options for reconfiguration of the supply chain



BUSINESS-BASED OUTCOMES

Efficiency is more than throughput and can be quite complex. It's about being able to model and optimize the right mix in your operations and supply chain network to maximize efficiency based on different business metrics and ever-changing constraints. As business metrics, such as sustainability, become higher priorities, the integrated business planning process must include these as a part of supply chain planning.

Important challenges & trends addressed:



Managing sustainability and customer fulfillment



Balancing profitability and efficiency



WORLD-CLASS OPTIMIZATION AND ANALYTICS

Recognized as a leading company in optimization technology, DELMIA provides world record-breaking optimization to drive the best course of action in your operations on a continuous basis, which directly translates to increased efficiency, asset utilization and ROI. DELMIA offers a broad set of industry standard and proprietary optimization technologies and experience to optimize your world and provide the right level of automation.

Important challenges & trends addressed:



Providing agility despite disruption



Enabling autonomous decision-making

These capabilities are provided using a collaborative environment that allows all stakeholders to be included in the decision and analysis process to arrive at optimized consensus plans.



VALUE & BENEFIT

Leveraging these critical DELMIA capabilities provides significant benefits for organizations:

- Balance and optimize financial objectives with operational and sustainability goals
- Reduce planning cycle times with effective collaboration
- Decrease lost sales and better serve high-margin demand
- Improve capacity utilization and productivity across the supply chain
- Gain global supply chain control and visibility

Together, these benefits allow for new levels of agility and resilience to realize real-world value:

“ DELMIA Quintiq’s streamlined approach to scheduling gives us full visibility of our present situation, enabling us to better anticipate demand, lead time and potential bottlenecks. This allows us to be more resilient against unforeseen disruptions. Increased assurance of on-time, in-full (OTIF) deliveries also enables us to maintain the trust and satisfaction of our customers. ”

Dobra Gheorghe, General Director, Alro



“ Our ability to react has significantly improved through the implementation of this collaborative scheduling solution—our people can work much more effectively. ”

Gerd Refflinghaus, Manager Production, Aleris



“ The DELMIA solution supports us in managing our complex supply chain process requirements. It empowers us by delivering full transparency regarding essential KPIs as well as material flows and inventory data. Optimized weekly schedules at each facility and interaction of company planning and scheduling strengthen an in-depth information flow. Thus, it supports us to immediately handle improvements or deteriorations in delivery performance to focus on our customers’ requirements. ”

Tobias Neitzel, Head of Process Management SCM, Thyssenkrupp Steel Europe



CONNECTING SUPPLY CHAIN PLANNING TO OPERATIONAL SUCCESS

As previously mentioned, digital twins developed for product and operational design are already in use (as seen with the Dassault Systèmes Virtual Twin Experience in the link below). The planning and decision-making in the supply chain essentially follows the same practice of using virtual models to make better real-world decisions.

Not only are the two processes similar, but they are also actually entwined. New product designs drive new suppliers and manufacturing operations that need to be planned. Changes in the supply chain drive potential facility and resource planning. The peak of sustainable agility and resilience is achieved when both virtual twins are connected.

The 3DEXPERIENCE platform

Dassault Systèmes provides a broad scope of solutions that help companies innovate from product ideation through planning and manufacturing. Using the **3DEXPERIENCE** platform, organizations can unify the critical parts of their business using digital tools and models. This platform is where supply chain and production virtual twins can work together to help organizations achieve their goals.

For more information on the Virtual Twin Experience for operational excellence, [read the eBook here](#).





CONCLUSION & NEXT STEPS

Imagine if you could...

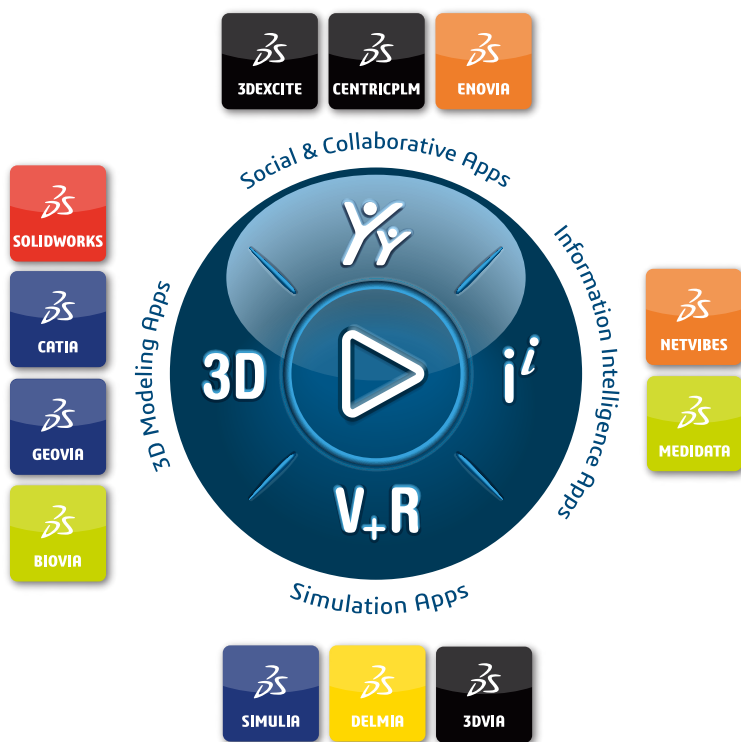
- ✓ Have an accurate model of all the critical participants and constraints in your value network
- ✓ Evaluate unlimited long-term supply chain strategies to meet long-term goals
- ✓ Develop optimized consensus supply chain plans with all stakeholders seamlessly
- ✓ Replan and adjust supply chain operations rapidly to adapt to changing demand and supply
- ✓ Include product development and strategy as a part of the supply chain planning process

The path to supply chain innovation and integrated business planning is available now for organizations that are seeking new answers and solutions to today's challenges and disruptions. With DELMIA, it is possible to start taking steps to building foundational process and infrastructure within critical areas of business, from high-level supply chain strategy to manufacturing, logistics and for workforce planning.

At DELMIA, we are proud to be helping organizations with their major supply chain initiatives:

- ✓ Enabling sustainable business operations by optimizing critical resources, people and energy
- ✓ Building resilient supply chains by empowering companies to confidently plan for the future and react instantly to disruptions
- ✓ Achieving business-based outcomes by enabling integrated business planning that optimizes financial and corporate goals

[Contact us](#) for more information.



Our 3DEXPERIENCE® platform powers our brand applications, serving 11 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the 3DEXPERIENCE Company, is a catalyst for human progress. We provide business and people with collaborative virtual environments to imagine sustainable innovations. By creating 'virtual experience twins' of the real world with our 3DEXPERIENCE platform and applications, our customers push the boundaries of innovation, learning and production.

Dassault Systèmes' 20,000 employees are bringing value to more than 270,000 customers of all sizes, in all industries, in more than 140 countries. For more information, visit www.3ds.com.

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