



The Connected Supply Chain

Future of the Life Sciences
Supply Chain Series: Issue #1



The future of Life Sciences Supply Chains is now. After experiencing a once-in-a-generation global pandemic and maneuvering through unprecedented uncertainty, the people and organizations that drive supply chains will never be the same. The idea of going “back to the way we were” is a fallacy. That’s not bad news; it’s great news.

As life sciences organizations emerge from two years of constant firefighting, a stronger and highly flexible supply chain is needed now more than ever; and succeeding in this new normal will require a smarter and more resilient workforce.

In a way, supply chain leaders of today have been given a gift. The lessons endured during the years of the COVID pandemic have yielded assets and strengths that will influence and enable the future of Supply Chain. Needless to say, life sciences supply chains are no longer an afterthought and are, instead, at the center of the C-suite growth agenda.

In our “Future of Life Sciences Supply Chain” series, we will examine five key topics that are top of mind for all life sciences leaders:

1. The Connected Supply Chain: Reimagining the life sciences supply chain as a dynamic, interconnected healthcare ecosystem to enable a more personalized customer and patient experience.
2. The M&A Transaction Landscape: Considering the impact of future acquisition integration or separation activities on life sciences supply chains.
3. De-globalization in Life Sciences: Re-evaluating the supply chain and manufacturing footprint, diversifying the supplier base, and bringing production bases closer to sources of demand to bolster resilience and limit disruption risks affecting all regions simultaneously.
4. Novel Therapeutic Modalities: Architecting patient-centric supply chain strategies and capabilities to deliver the right drug therapy and services to the right patient, at the right time (and place), and at the right price point.
5. Making Sustainable Supply Chains Real: Linking supply chain functions to ESG imperatives, considering the regulatory landscape, determining funding and talent required to ultimately enable a purpose-driven and sustainable supply chain.

Introduction

Life sciences supply chains continue to evolve and transform to address the volatility and growth the industry expects. We are seeing an unprecedented acceleration of end-to-end supply chain digitalization as organizations endeavor to enable data-driven, intelligent, resilient, responsive, and agile supply chain operations. However, most of today's life sciences supply chains still operate like analog machines trying to solve problems in a digital world.

In a recent KPMG survey, 54 percent of supply chain leaders said they recognize that, although there are vulnerabilities in their supply chains, they are either still in the process of planning for supply chain resiliency and stability or have not yet started. According to a recent Gartner survey, more than 50 percent of chief supply chain officers (CSCOs) plan to invest in digitalization over the next two years. The goal is to drive top-line and bottom-line growth while enabling a more personalized and real-time customer/patient experience. Life sciences supply chains must have the agility and resiliency to operate in the ever-changing digital world and deliver not just revenues and profits, but also sustainability.

Factors forcing life sciences supply chains to adapt and evolve

Access to data and digital technology is increasing at an exponential rate and changing the game. New operating models are being launched emphasizing not only a patient focus, but also a consumer focus influenced by the consumerization of healthcare. The supply chain workforce is constantly being pushed to learn new skills to keep up with the industry. And supply chains must drastically change to address the increased complexity that comes from attempting to keep pace with the trends and forces that are driving change and disruption in the industry... and do so at an accelerated pace and scale.

Key drivers behind the push toward drastically transformed supply chains:

- **Limited visibility and collaboration across the end-to-end network:** Lack of global visibility and collaboration across the end-to-end network are still at the center of supply chain disruption. There is a distinct call to action to make investments that enable flexibility, agility, and resiliency – especially when it comes to T2 and T3 suppliers.
- **Shifting to a value-driven supply chain:** Life sciences supply chain organizations are not exempt from elevated supply costs and working capital pressures. Therefore, many are proactively seeking to leverage the supply chain as a strategic asset for value creation. Given current economic and inflationary challenges, shifting from a traditional cost-based supply chain model to a value-driven supply chain is an imperative. Organizations who effectively understand their end-to-end baseline costs are enabled to free up capital and reduce short-term variable costs, while strengthening cash flow positions and identifying sources and opportunities for top-line growth. Those who fail to do so will be putting the growth of the organization at risk.
- **Automation and digitalization of supply chain functions:** Advanced technologies will be critical components of moving from non-scalable to more agile supply chain designs and solutions. Organizations need to overcome their heavy reliance on the paper-based and manually intensive processes that are still the backbones of life sciences supply chains today.
- **Data-driven insights and intelligent analytics:** Most life sciences supply chains are challenged with effectively enabling a “single source of truth” given the amount of legacy tech debt and fragmented systems that contain redundant and inaccurate data and inconsistent definitions of performance measures.
- **New modalities and hyper-personalization:** Growth in the life sciences industry will be predominantly driven by novel therapies (cell & gene therapies, oncology, rare diseases, etc.) in the coming years. Organizations will shift their treatment focus from one-to-many, generalized offerings to one-to-one, targeted, and hyper-personalized product offerings (3D lenses, “polypills,” etc.). Some of these new treatment modalities will provide precise treatments based on an individual’s cells or genes, and even the promise of a “cure” for previously untreatable diseases. The supply chain for these therapies plays a critical role not only during clinical drug manufacturing and distribution, but also once therapies reach and go beyond the commercialization phase. This shift will require the transformation of the entire end-to-end supply chain to effectively operate and support these therapies.
- **Talent and culture considerations:** Modernizing supply chains will require a different set of skills and competencies, as well as organizational willingness to embrace a culture of continuous innovation. Advanced analytics in the supply chain will likely become a core operational component, allowing organizations to leverage data assets and ensure commercial viability in the new complex era of personalization. Courageous leadership will be required to effectively drive workforce reskilling and the rise of the “digital supply chain enterprise architect.”

The introduction and expansion of the ESG / sustainability agenda, future acquisition integration (or separation) activity, and market expansion will further strain life sciences organizations and put at risk their ability to deliver on their strategic priorities and growth objectives.

It’s no longer about delivering a drug product or service; it’s about enabling a positive employee experience and delivering a great customer and patient experience across the end-to-end value chain. We will continue to witness life sciences organizations embrace new science and emerging technologies to further accelerate the digital shift and adoption of new technologies, all while maintaining economic viability. The question remains, will organizations be able to continually drive this heightened level of acceleration to deliver the next generation of patient care?

How is technology changing the game?

To address the priorities of today and be ready to meet the future needs of the entire healthcare ecosystem, life sciences supply chains must be re-architected to be less of a back-office function, rebuilt for disruption, and reimagined to deliver a better customer and patient experience.

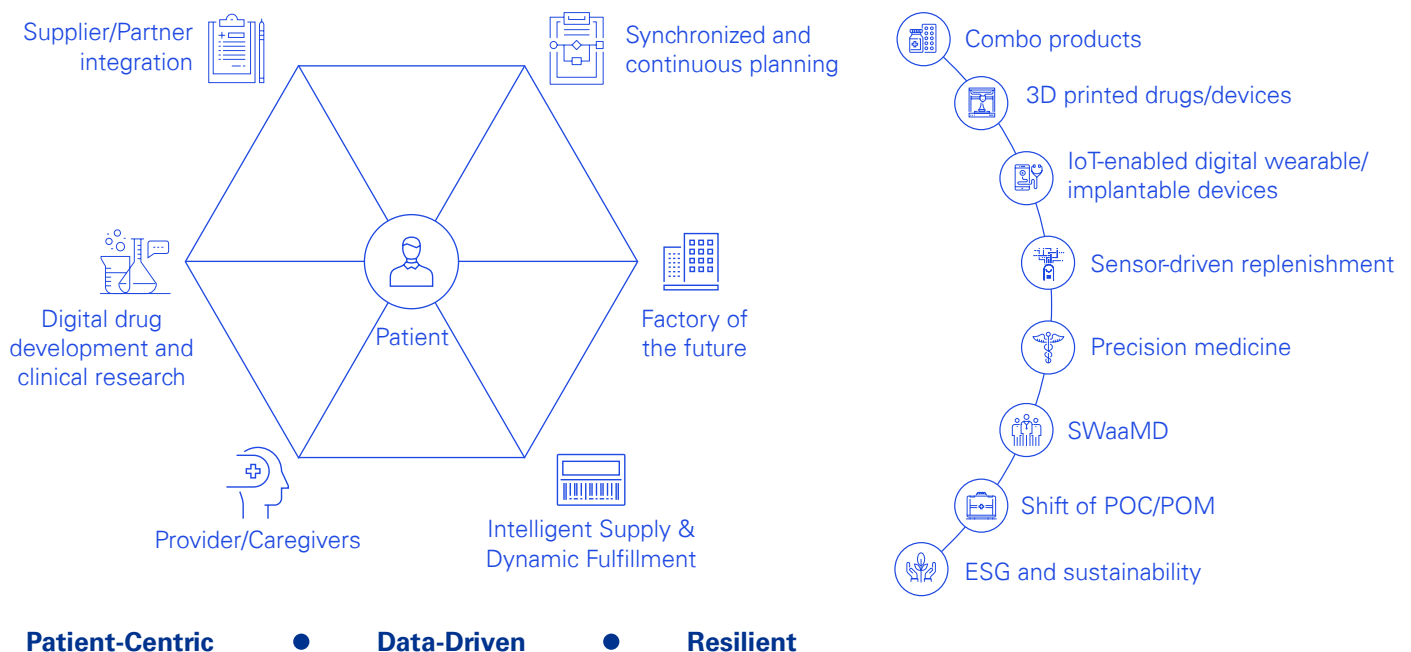
Our perspective is that, as the industry continues to shift toward more complex biologics and highly personalized drug therapies, devices and services, supply chains must transform to enable and operate as parts of a dynamic, interconnected healthcare ecosystem. The Connected Supply Chain (Exhibit 1) will be powered by a cohesive and aligned digital supply chain strategy and operating model and will be enabled by the right mix of digital supply chain capabilities and solutions.

By proposing a cohesive and aligned digital supply chain strategy & operating model, we are effectively defining what “being digital” is for the supply chain organization and addressing the multiple perspectives on what digital capabilities really are. If executed appropriately,

and everyone in the organization can stand behind it, this mindset will become the foundation for the digital strategy and operating model definition for the organization and drive prioritization of and investment in digital initiatives. Ultimately, the model addresses digital talent, competencies, and ways to enable a culture of continuous innovation.

By the right mix of digital capabilities, we simply mean a set of prioritized solutions that link to the organization’s vision and strategic goals – such as enabling an autonomous supply chain that self-learns, adapts, and focuses holistically on continuously meeting the needs of value-chain customers, patients, and caregivers, while driving cost efficiencies and new business model definitions focused on generating top-line growth. Technology advances such as cloud computing, 5G connectivity, Blockchain, artificial intelligence (AI), robotic process automation, IoT, digital twins, etc., are paving the way towards a fully digitized and autonomous supply chain.

Exhibit 1: The Connected Supply Chain - A dynamic interconnected healthcare ecosystem



The characteristics of a modern, digital, and connected life sciences supply chain

Intelligent and Connected:

Life sciences organizations can leverage emerging technology to enable an end-to-end, connected, and intelligent architecture that improves supply chain visibility upstream and downstream. Across all industries, investing in technologies to enhance supply chain visibility is cited as the number one action 61 percent of organizations are likely to take, as cited in our recent supply chain survey report. Organizations will be able to leverage external data and signals, fit-for-purpose “control towers,” advanced analytics, automation, digital twins, and other advanced technologies to manage by exception and make intelligent trade-off decisions. Benefits will include autonomous and cognitive planning, predictive plant maintenance, automated re-stocking, and sensor-based replenishment and fulfillment to name a few examples. The experience will be touchless, seamless, and integrated, requiring limited human intervention.

Data Driven:

Data will be the new currency in future supply chains, giving leaders a 360° view of customers and extended value-chain participants. A data-driven supply chain leverages single source of truth platforms and generates vast volumes of data that can be accessed in real time, allowing for actionable, reliable insights leading to informed decisions that drive business value. By leveraging modern data technology and platforms to automate data acquisition, management of data, and analytics processes, organizations become better equipped to streamline and accelerate supply chain and manufacturing insights. Companies across all industries are largely on board with these types of investments: 59 percent of respondents to our recent supply chain survey report said they would invest in digital technologies to process and analyze data in the next 12-18 months. We know there is value to be generated from data by:

1. effectively addressing fragmentation that leads to variability both within and across sites, resulting in lost yield, underutilized assets, and decreased quality;
2. providing unparalleled insight into the usage patterns of high-value assets, which can be quickly converted into actions;
3. capturing and sharing knowledge currently locked in the minds of shop-floor operators to reduce ramp-up times;

4. developing data-driven relationships for better collaboration across internal and external partner ecosystems; and
5. guaranteeing authenticity and tracking product movement.

Agile & Resilient:

An agile and resilient supply chain is equipped to do more than simply resist and recover from disruptions. It focuses on flexibility to respond to unforeseen disruptions, end-to-end visibility to enable a holistic approach to decision making, and intelligence to sense trends and detect opportunities. It allows organizations to respond quickly to changes in demand and customer preferences, and it is made to handle unpredictability through “postponement-like” strategies and technology innovation. To effectively mitigate the risks and impacts of disruptions and benefit from faster order fulfillment times, life sciences supply chains will need a combination of strategies and approaches, such as re-thinking supplier strategy and collaboration, diversifying and segmenting the supplier and partner base, strengthening relationships with top suppliers, and enabling intelligent platforms that can onboard and connect with new partners quickly and even extend the appropriate level of collaboration to T2 and T3 suppliers and partners when required. Automation and digitalization of supply chain and manufacturing operations (e.g., automating warehouses, distribution centers, and manufacturing facilities through robotics, AI, digital process automation, IoT, sensors, etc.) will be key. Organizations will realize increased flexibility, such as rapid adjustment of production levels, shifts to alternative suppliers, and rerouting of shipments. Implementing risk management strategies, such as insurance or contingency planning, can help mitigate the impact of disruptions to the supply chain as well.

Patient-centric:

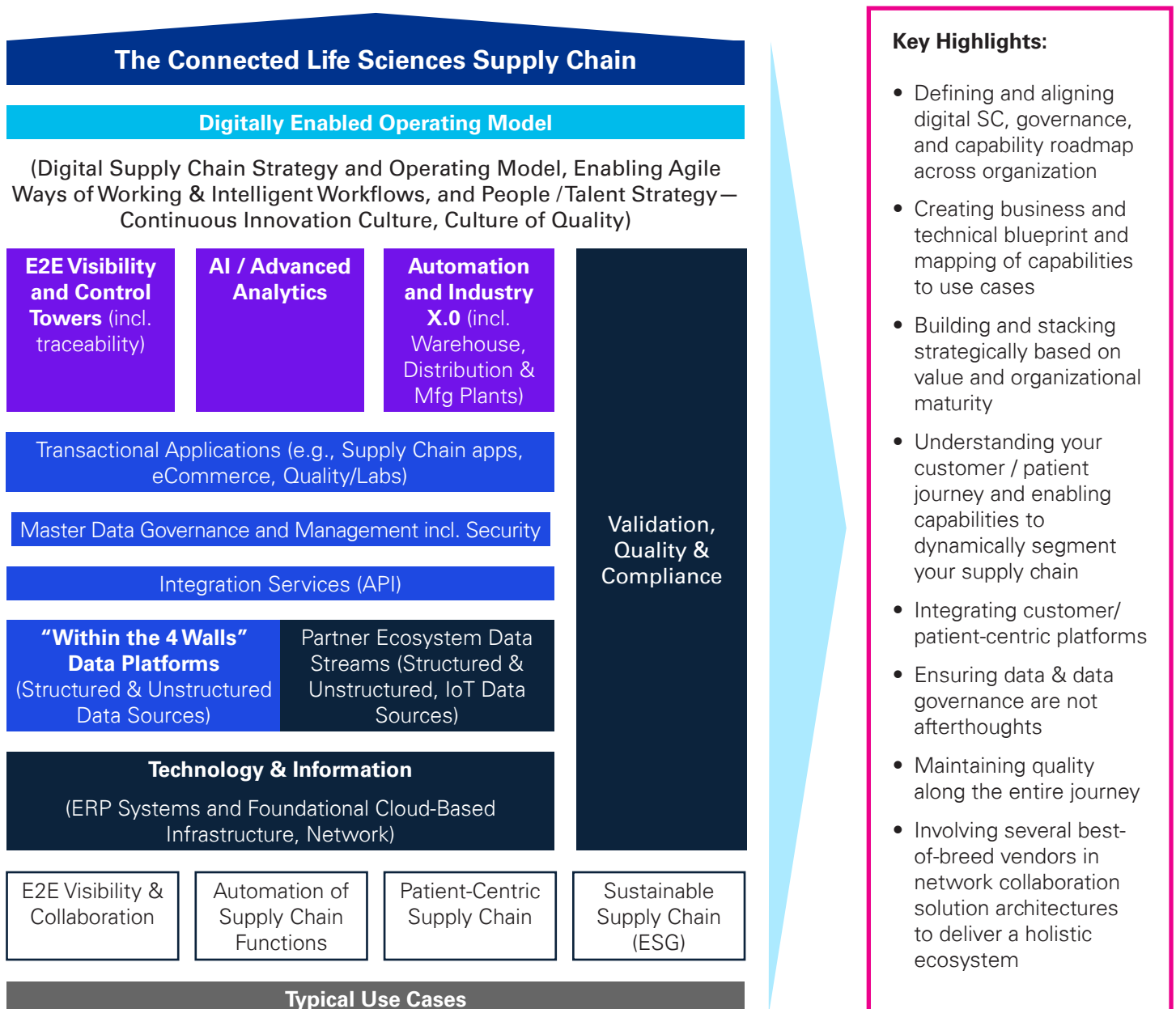
A truly data-driven and connected supply chain provides life sciences organizations the opportunity to architect and design a patient-centric supply chain. Through the implementation of initiatives that leverage the Voice of the Customer (VoC) and patient journeys, supply chain executives are better equipped to face the increased complexity of their evolving product portfolios and the complexity that introduces to effectively manage the

supply chain. Architecting a patient-centric supply chain is now possible due to today's state of technology advances, which can reshape and automate outdated processes and enable a fully digital supply network. However, this shift also requires an increased level of cross-functional collaboration between the supply chain, commercial, and R&D organizations to align supply chain strategies with a deep understanding of a patient's life and experience with a health condition and its associated treatments. The

supply chain for a cancer or rare-disease patient runs and operates completely different than how a supply chain for a cardiovascular or diabetic patient operates. Definitions of patient archetypes and segmentation of the supply chain are key capabilities that need to be in place for the supply chain to effectively address the unknown and unmet needs of patients and deliver breakthroughs that bring the vision of better patient care to life. (Exhibit 2)

Exhibit 2: Architecting The Connected Supply Chain

Designing a Digital Transformation Blueprint and Roadmap



Key barriers to modernizing the supply chain

Despite research that validates that life sciences organizations are planning to prioritize supply chain transformation in the next 12-18 months, there are still several barriers to overcome. These can be broken down into technology, organizational, and value categories:

Technology

- Not having the right solution architecture defined and not taking inventory of what the organization has and does not have in terms of the technology stack.
- Sorting out the noise in the fragmented digital technology landscape, with no one vendor providing the full set of capabilities a business may need.
- Technology investments not keeping pace with the growth expectations and strategic direction of the business.
- Allowing the latest technologies to dictate investment decisions.

Organizational

- Lack of definition and alignment of a strategic vision and a digital supply chain strategy and roadmap.
- Lack of organizational maturity and readiness to define the sets of digital skills and competencies required from executives to shop floor operators, including slow adoption of truly agile ways of working.
- Overcoming an “if it ain’t broke, don’t change it” mentality.
- VoC and customer/patient journey insights not leveraged effectively (i.e., not shared across functions)
- Lack of structured approach to prioritize and manage pilots and proofs of concept to effectively scale and expand digital supply chain initiatives.

Value

- Inability to effectively define a compelling business case with the appropriate level of alignment and accountabilities established.
- Not measuring and reporting on the value being realized.



Four practical steps to take

Accelerating the adoption of advanced technologies will drive the pace by which life sciences organizations can dramatically transform and reshape their supply chains. However, success requires strategic thinking and breaking down linear and functional silos to dynamically connect and integrate the full supply network in a collaborative and optimized way.

Following are four practical steps that life sciences supply chain executives can adopt as they reimagine future-ready supply chains:

1 Articulate a digital supply chain vision and strategy

Define a strategic vision of what a patient-centric supply chain would look like and how a future-ready supply chain should operate – prioritizing agility and resilience as engines of profitable growth. A critical next step is defining core capabilities and foundational building blocks to enable the vision and the value to be realized. This step will allow organizations to demonstrate not only how reimagining the supply chain can deliver operational success, but also how it can support the wider enterprise to deliver top- and bottom-line growth and performance.

2 Assess your digital foundation readiness and build data-driven, technology-enabled capabilities

Evaluate the supply chain's current state of digital and data infrastructure maturity across the end-to-end supply chain network and compare it to the future-state supply chain architecture blueprint. Ask yourself the following questions: Are the organization's processes adaptable and ready to accelerate the adoption of digital and emerging technologies? Can the infrastructure handle and consolidate the volume of structured and unstructured data required to drive actionable business insights and performance transparency? How and which visualization tools and platforms are enabling true real-time visibility across the end-to-end network? How and when can an advanced analytics layer be applied to move toward a more predictive and prescriptive state?

3 Pilot fast, scale, and upskill to sustain

Start small, scale fast, and think big! Starting with small pilot projects will help demonstrate the feasibility and value of concepts and solutions, while building confidence and buy-in across the organization. Once these projects are complete and value is proven, scale fast across

high-value, low-complexity areas of the supply chain. Adopting a holistic change management strategy and process is of paramount importance to enable organizational readiness, upskill talent, and drive the expected level of adoption of the capabilities enabled. Data and digital skills are needed at all levels of the organization, from the shop floor to the C-suite. To sustain effectively, leaders need to become comfortable with discomfort and with the unknown and allow the vulnerability that comes with opening themselves to learning from a new generation of tech-savvy workers (reverse or mutual mentorship). Undertaking a significant level of transformation and innovation takes a village, and the appropriate culture and mindset are critical to ensuring success.

4 Focus on value realization and continuous innovation

To continue to shape the future of life sciences supply chains, it is necessary to measure and communicate the value story throughout the journey as this will remind the organization why it is necessary to undertake such massive efforts. The future of the life sciences supply chain will be driven by the end customer (the patient), made possible by the pace of technological innovation, empowered by collaborative platforms and partnerships (including regulatory organizations), and built to self-innovate. Enabling an engine to sense and signal disruption and change along with a culture of continuous innovation will be table stakes when it comes to meeting the higher expectations of the market and realizing the promise of the future today - delivering breakthrough innovations that bring the vision of better patient care to life.

Is your organization ready to help shape the future of healthcare?

How KPMG Can Help

KPMG is in the business of designing and implementing purpose-built supply chains. We are a full-service advisory firm with a broad range of functional and industry experience that can help address your supply chain needs from strategy through execution. Because we anticipate that over the next two years the principal focus areas for life sciences investment will be in supply chain technologies and diversification (of supplier base, production, and transportation partners), we have been

partnering with a number of organizations to build and adapt our products and services around the following needs and priorities:

- E2E visibility & collaboration
- Digitalizing and automating supply chain functions (including supply chain security considerations)
- Patient-centric supply chain strategy (designing supply chains for new modality therapies)

Our solutions

Supply Chain Strategy & Analytics	Supply Chain Planning	Supply Chain Execution	Logistics & Distribution
<ul style="list-style-type: none"> • Digital Supply Chain and Manufacturing Strategy • Supply Chain Operating Model Design • Complexity Management/ Cost to Serve • Supply Chain Segmentation • Supply Chain Data & Analytics • Supply Chain & Manufacturing Integration / Separation • Sustainable Supply Chain (ESG strategy) 	<ul style="list-style-type: none"> • Demand and Supply Planning • Sales and Operations Planning (S&OP/S&OE) • Integrated Business Planning (IBP) • Cognitive planning • Inventory Planning and Optimization • Supply Chain Planning Technology Enablement and Implementation 	<ul style="list-style-type: none"> • Order to Cash optimization • Manufacturing improvement and Factory of the Future (Industry X.0) • Product Planning and Control • Supply Chain Visibility and Collaboration (ie. Control Towers) • Supply Chain Execution Technology Enablement and Implementation 	<ul style="list-style-type: none"> • Logistics Strategy and Operating Model • Network Optimization • Transportation and Distribution Management • Inventory Optimization and Management • Warehouse management • Reverse Logistics • L&D Technology Enablement and Implementation

¹ How to build a supply chain ecosystem, Gartner, 2021.

² KPMG supply chain survey, 2022.

³ Future-ready supply chain: Life Sciences, KPMG, 2022

⁴ KPMG supply chain survey, 2022.



Contact



Stephanie David
Principal, Life Sciences Supply Chain
KPMG LLP
T: 610-425-8171
E: stephaniedavid@kpmg.com



Mary Rollman
Principal, Supply Chain Strategy
KPMG LLP
T: 312-618-9863
E: maryrollman@kpmg.com

KPMG has been recognized as a global leader and “Pacesetter” for supply chain by ALM Intelligence in their report entitled ALM Pacesetter Research: Supply Chain 2023-24.

Scan to learn more:



Some or all of the services described herein may not be permissible for KPMG audit clients and their affiliates or related entities.

kpmg.com/socialmedia



The information contained herein is of a general nature and is not intended to address the circumstances of any particular individual or entity. Although we endeavor to provide accurate and timely information, there can be no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. No one should act upon such information without appropriate professional advice after a thorough examination of the particular situation.

© 2023 KPMG LLP, a Delaware limited liability partnership and a member firm of the KPMG global organization of independent member firms affiliated with KPMG International Limited, a private English company limited by guarantee. All rights reserved. The KPMG name and logo are trademarks used under license by the independent member firms of the KPMG global organization. NDP441528