



INDUSTRY REPORT /

The Pharmaceutical Supply Chain: Closing the Visibility Gap



EXECUTIVE SUMMARY

The Pharmaceutical Supply Chain: Closing the Visibility Gap

Nonstop advancements in science and technology are constantly reshaping the pharmaceutical industry and propelling it forward. While cold chain shipping has always presented a significant challenge, the COVID-19 pandemic highlighted the need for visibility at every node along the chain. In the wake of escalating cold chain and pandemic supply challenges and mounting consumer pressures, a sea change is underway toward harnessing greater visibility and smarter paths to patient communities.

The pharmaceutical supply chain is making a sharp pivot out of necessity from a just-in-time model to a test in agility, resilience, and disruption that goes far beyond vaccinations to navigate fast-growing industry complexities. In this study we explore what's driving the current trends and the bold, deliberate actions most pharmaceutical and life science supply chain executives are taking now to reduce waste and accelerate patient outcomes.

INTRODUCTION

This report includes survey findings from one hundred supply chain executives across the United States—uncovering the current lack of visibility and accelerated industry need for predictability and control across the supply chain.



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According to a United Nations Environment Programme article, **up to 1 billion** COVID-19 vaccines could be saved with better supply chain visibility.



The World Health Organization reports that **more than half** of vaccines are wasted worldwide.

Source:

World Healthcare Organization, "Monitoring vaccine wastage at a country level," May, 2005

United Nations Environment Programme, "Why optimized cold-chains could save a billion COVID vaccines," Patrick Boulen, June 26, 2020

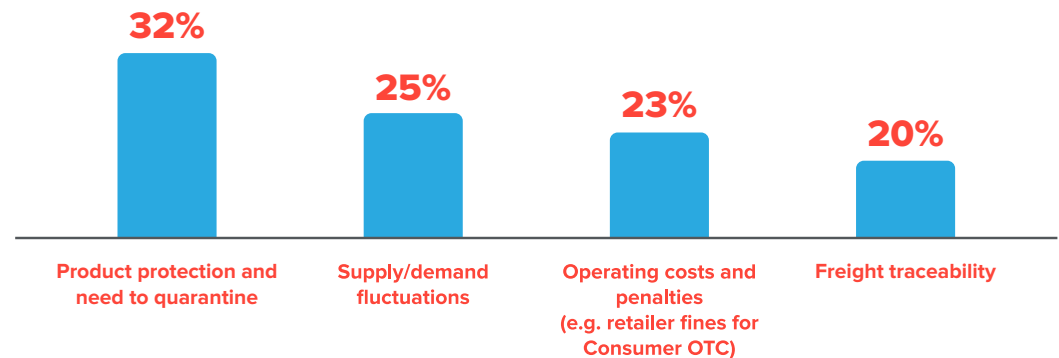
THE C-LEVEL MANDATE FOR DEEPER VISIBILITY

A multi-symptom solution is needed.

The impacts of the COVID-19 pandemic have exacerbated supply chain vulnerabilities that have existed for years. During a time when even the most stable supply chains are facing volatility and disruption, it comes as no surprise that executives in the pharmaceutical and life sciences industries report challenges that cover a breadth of supply chain functions.

When asked about their biggest pain point in transporting and storing goods, survey respondents pointed to product protection and the need to quarantine as their top concern—understandable, given the sensitive nature of vaccines. Tighter security or more stringent protocols won't be a silver bullet solution, though. The relatively even distribution among other responses (see diagram below) points to the need for a more comprehensive approach to improving operations and resilience across pharmaceutical supply chains.

Biggest Pain Point in Transporting & Storing Goods



Our reporting shows that more than half of pharmaceutical giants surveyed still aren't implementing warehousing visibility solutions. With less than half of enterprise pharmaceutical and healthcare supply chain organizations leveraging visibility solutions, there has never been a greater opportunity to advance the pharmaceutical supply chain. With advances in supply chain technology, leaders are able to reduce the waste that has plagued the industry for decades while taking a more active role in the product-to-patient journey.

Supply chain disruption is common, but product waste as a result of disruption is avoidable and steps can be taken to prevent losses from occurring. Unopened vial wastage is generally attributed to cold chain and stock management issues that can be minimized with visibility and the window to intervene when necessary. With supply chain visibility, manufacturers can monitor product temperatures and other conditions like humidity with the ability to connect with carriers and locations to alert them if conditions are falling outside parameters and at-risk of compliance failure.



**Pharmaceutical executives
estimate vaccine waste of**

Up to 20%

Source: The Wall Street Journal, "Covid-19 Vaccine Delivery Will Present Tough Challenge to Cargo Airlines," Doug Cameron, October 5, 2020





Changes are coming—and they are expensive.

Suppliers in the healthcare and life sciences industries today face a monumental challenge. The diversity of medications, treatment options, and access to healthcare facilities, including telemedicine, is great news for patients, but can cause serious challenges for the unprepared pharmaceutical supply chain.

Being able to pinpoint when and where products dip out of recommended temperature ranges is critical since, in many cases, the manufacturer owns accountability for the vaccine or therapy until the point of patient vaccination or administration onsite at the healthcare provider. That means healthcare providers have less ownership of the product even after it enters their facilities.

This costly shift in accountability along with the growing cold chain complexities and therapy personalization have not gone unnoticed by pharmaceutical manufacturers either. Most organizations are actively planning or implementing and investing in new visibility technology—leaving only 6% of pharmaceutical and healthcare organizations behind.



Just 6% of organizations surveyed aren't investing in visibility technology with no plans to do so.

“FourKites empowers us to tear down some of those silos. The platform is a building block for us to support a customer-centric ecosystem of health care products, supply chain solutions and adjacent services. We’re pulling together all of the components onto our platform for awareness of what’s happening. And it will unlock our supply chain to perpetually operate at the highest level. It’s allowing us to actually see— it’s really hard to collaborate when you can’t see what’s happening.”

JOSHUA DOLAN
VP OF GLOBAL LOGISTICS,
CARDINAL HEALTH



NOW IS THE TIME TO INNOVATE

IoT is making more possible.

The need for adaptability, precision, and agility has never been more critical to pharmaceutical manufacturers, healthcare providers, and their patients—a robust trifecta only achievable with real-time supply chain visibility and powerful data insights.

With the Internet of Things (IoT) becoming pervasive and visibility technologies readily available, manufacturers can follow each shipment from departure to its destination. The number of organizations leveraging IoT in the cold chain is accelerating amid the ongoing COVID-19 health crisis. The cold chain IoT tech market is projected to be worth almost \$5B in 2021.

Our pharmaceutical industry report focuses on the urgent demand for uninterrupted visibility with edge technologies across the industry landscape with growing opportunities to circumvent product loss amidst disruption.



The market valuation for IoT cold chain tech has climbed to **\$4.79 billion**

Source: Pharma Manufacturing, "Exploring IoT-powered telemetry in Pharma cold chains", Emily Newton, July 13, 2021

Few organizations are ready to risk being left behind.

The majority of respondents - a commanding 94% of the executives surveyed—actively leverage visibility technology to track inbound raw materials and plan manufacturing schedules. However, nearly a third of them are not satisfied with their existing platform’s capabilities—leading many of them to implement a modern, digital Supply Chain Visibility (SCV) solution for greater control and more robust capabilities.

The trend is undeniable, with 93% of those surveyed implementing SCV in the next year and 63% acting swiftly within the next six months.

Technology is becoming more critical through disruption.

In their Q4 2020 report, “How to become CEIV Pharma Certified,” the International Air Transportation Association (IATA) explores how the pharmaceutical logistics market is growing more complicated with 250 COVID-19 vaccines actively in development, and obstacles and product loss increasing with cold-chain requirements. The study navigates mitigating temperature excursions and vaccine loss across the chain. (See graphic.)

Due to temperature excursions, half of vaccines are wasted annually, costing manufacturers billions of dollars. The stakes are rapidly escalating with more healthcare providers taking little to no responsibility for the product until the moment it’s administered directly to patients.



30% of executives surveyed are unhappy with their current SCV solution



93% are implementing one in the next year



63% are acting in the coming months

Inventory models are changing.

Vulnerabilities in pharmaceutical supply chains have existed for years. However, the shortfalls have never been more consequential or more pronounced. Throughout the ongoing global epidemic, costly damages—both in monetary value and dire patient need—resulted from devastating product loss. Unfortunately, medical wastage isn't unique to the urgency of the COVID-19 pandemic.

Other perils have historically challenged pharmaceutical supply chain leaders, including lack of product availability due to either expiration or transportation delays, product recalls, theft, damage, and other types of loss. Tracking product quantities on the move helps organizations avoid overstocking specific time-sensitive drugs to maximize stock, ROI, and availability while minimizing waste.

First in, first out (FIFO) management difficulties are more abundant without accessible, current inventory data and integrated item-level tracking capabilities. Organizations can make agility gains with deeper visibility to fuel smart, swift stock optimization. With the right SVC solution, pharmaceutical and healthcare businesses can build a more resilient and competitive supply chain, optimizing performance and upholding stricter compliance mandates.



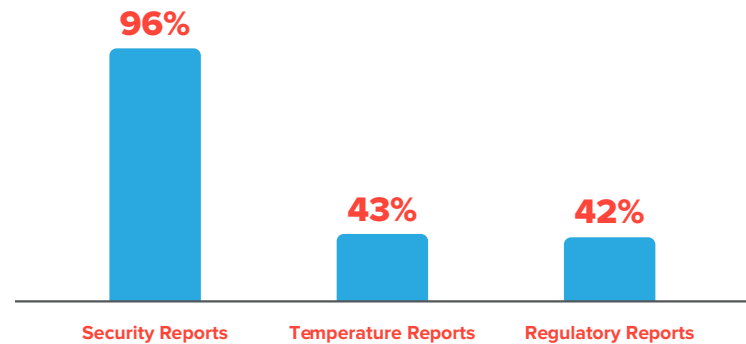


SECURITY REPORTING—A MUST AGAINST DISRUPTION

Security reporting is the priority for most.

Almost a third of survey respondents identified product protection as their biggest pain point in transporting and storing pharmaceuticals. 96% of the pharmaceutical supply chain executives pinpointed security reports as their main method to promote product retention—outranking both temperature and regulatory reporting. Their concerns are not unfounded. According to a study by the British Standards Institution, the United States ranks in the top three countries for pharmaceutical cargo theft.

Reports to Help Manage Performance and Security



Protecting products from damage and theft is a clear priority for pharmaceutical and healthcare organizations, and the numbers explain why.

Source: British Standards Institution, "Theft and Counterfeiting: Global Threats to Pharmaceutical Supply Chains", <https://www.bsigroup.com/en-US/blog/supply-chain-blog/risk-management/theft-and-counterfeiting-global-threats-to-pharmaceutical-supply-chains/July 13, 2021>

Product loss is a growing concern.

The average value of pharmaceutical theft reaches into the six figures with even the smaller thefts providing a sobering contrast to other industries. When theft does occur, they are generally larger losses resulting from loss of an entire truckload or a facility break-in.

In 2020, \$1.2M in oncology drugs were stolen from cold storage at a warehouse, recorded as the largest pharmaceutical theft of the year.

In addition to theft, product loss occurs due to a full myriad of factors including expiration and product falling out of compliance to the given temperature parameters. According to Supply Chain Dive, vaccine losses due to temperature excursions cost around \$34.1 billion annually in lost product cost, replacement cost, and wasted logistics investments.



Temperature excursions already cost Healthcare shippers

\$34B annually

Source: Supply Chain Dive, "Why cold chain tracking and IoT sensors are vital to the success of a COVID-19 vaccine,"

Deborah Abrams Kaplan, August 11, 2020

Healthcare Packaging, "Seven Recent Statistics in Pharma Cargo Theft," Keren Sookne, October, 29, 2020



Finding relief in innovation.

Real-time security reporting can help organizations mitigate risk. With countless pharmaceutical products being carried via parcel, courier, air freight, and trucking, it is critical to have a process that enables you to monitor the progress of every package in transit at any given time. Many organizations focus on using physical security practices as guard rails for the supply chain. The methods used can vary from retaining third-party security services to follow shipment progress to dispatching decoy shipments. More businesses are enforcing driver mandates, banning vehicle stops within the first and last 250 miles where the risk for theft is greatest.

IoT-based sensor tracking augments these procedures with real-time data and alerts, providing greater insight into the security and status of the product. With physical location tracking of each shipment at all times—companies receive alerts when a truck stops or goes off-route. SCV platforms can even provide insights into where a truck went after being diverted. FourKites offers the ability to define “Red Zones,” or spots where issues are most likely to occur. The platform provides alerts when a load is approaching a designated high-risk area which can help organizations mitigate disasters before they can occur



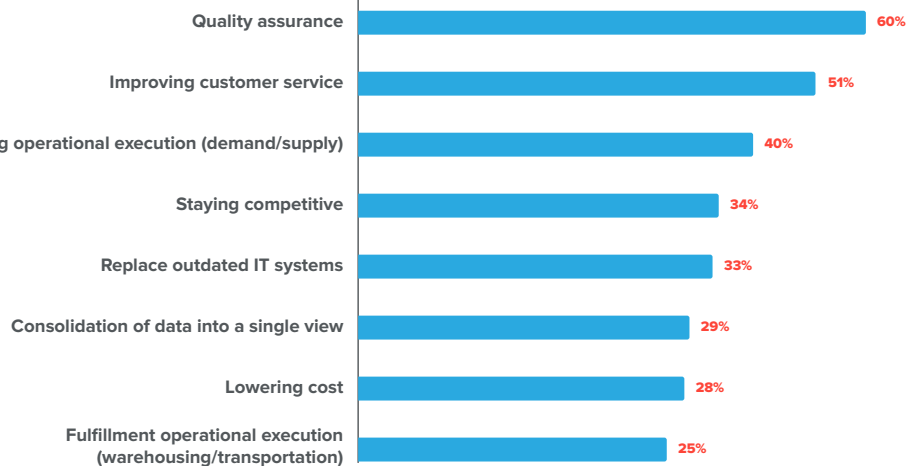


QUALITY ASSURANCE IS KEY

Quality assurance is driving SCV investments.

Quality assurance is the key driver for organizations looking to enhance security and visibility requirements—followed closely by improving customer experience and operational execution respectively.

Drivers of Supply Chain Visibility Investments



The small details make a big impact.

In many other industries, the concept of true quality assurance throughout the end-to-end supply chain doesn't exist at the transaction level, not the way it does for the healthcare supply chain. Because in pharmaceuticals, life sciences, and healthcare, businesses with life-saving goods cannot afford to simply hope for the best. To build an agile, adaptable, and resilient pharmaceutical supply chain, organizations need strong, accurate data and real-time insight into what's happening in their operations on a ground level.

Eliminating breakpoints across systems can help organizations avoid taking a financial hit while potentially endangering patient lives. Data and visibility can prevent issues from happening before they occur.

Something as simple as a temporary refrigeration failure can have devastating impacts on drug efficacy. Temperature excursions can be minimized with location intelligence and deeper vaccine supply chain visibility—a strategy already supporting other industries in increasing agility while reducing billions of dollars in waste with actionable data and location insights leveraged using IoT sensors every step of the way. End-to-end agility and transparency can prevent costly, ineffective cold chain management while more lives and economies rely on COVID-19 prophylaxis.

While disruption is sometimes inevitable, having critical tools and data points with an unobstructed view can make it much easier to address.





“Over the past few years, shipment tracking has become table stakes across all modes. FourKites technology gives the importing plant extra data, making the process of shipping by air more transparent and efficient.”

JON MOSHER
EXPORT OPERATIONS LEAD,
BAYER

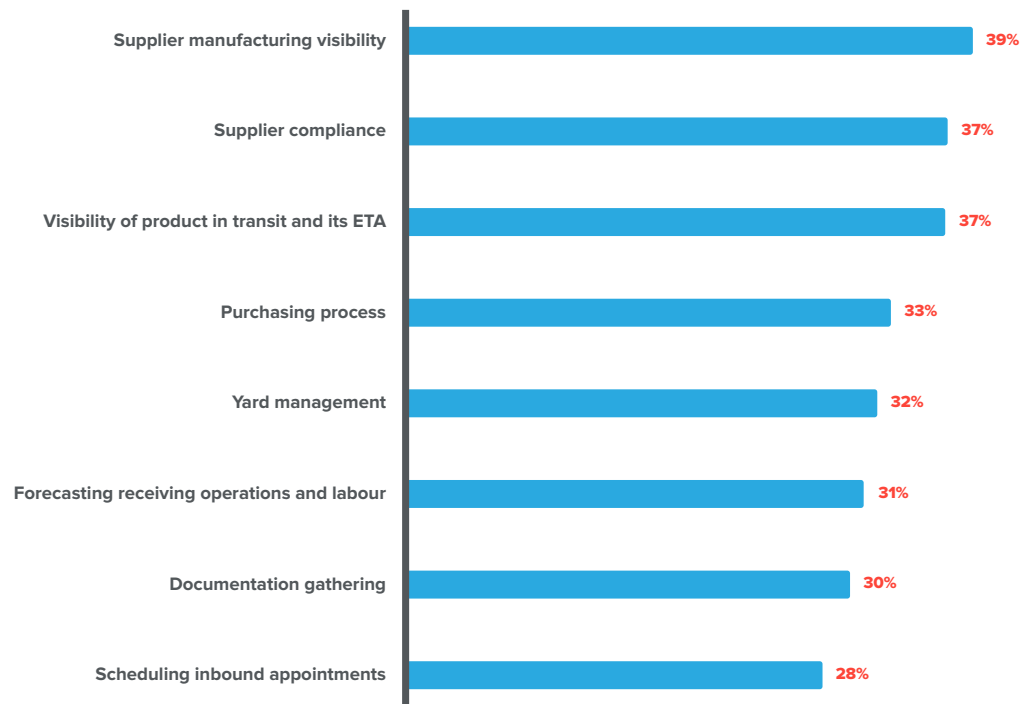


MOUNTING INBOUND PRESSURES

Visibility and timing rank high.

While there is a range of inbound supply chain challenges, supplier manufacturing visibility, supplier compliance, and product ETA and visibility in transit topped the list. 39% of respondents identified supplier manufacturing visibility as their biggest concern, echoing the findings of quality assurance as a key driver for innovation. Supplier compliance and product visibility in transit were highlighted as key obstacles by 37% of respondents for each.

Most Pressing Inbound Challenges



Timing and location are everything.

The typical pharmaceutical supply chain is a complex network of stakeholders with interconnected operations, and any disruption can have far-reaching effects. All shippers, from over-the-counter drug manufacturers to those creating specialized gene therapies, are susceptible to the financial and planning impacts of delays or disruption across all links in the supply chain.

So, it comes as no surprise that pharmaceutical supply chain executives see the value in pinpointing the exact location of shipments with predictive ETAs that save vital time and resources without costly expediting. Having an open view into product shipments—any mode, anytime, anywhere—fuels greater efficiency while countering the bullwhip effect. With the ability to calculate accurate cycle timing, organizations can right-size inventory while actively mitigating risk and reducing inventory costs.

The same technology gives organizations a deeper window into supplier manufacturing visibility. In all these areas, smarter SCV innovation is helping pharmaceutical organizations move away from reactive management of logistics and supply chain operations to a more strategic, proactive approach.



3M began ramping up production of N95 respirators in January 2020. It dropped non-critical SKUs and refitted production lines for critical supplies, according to Kaitlyn DeSpiegler, global transportation specialist at 3M, speaking at FourKites' visibility conference in September. 3M put its critical shipments on the FourKites system to get real-time data in one place, which allows 3M to keep less buffer stock on hand, allowing the lean operations and balance sheets many supply chains strive to achieve."

SUPPLIER OF THE YEAR: 3M, Supply Chain Dive, 9 December 2020





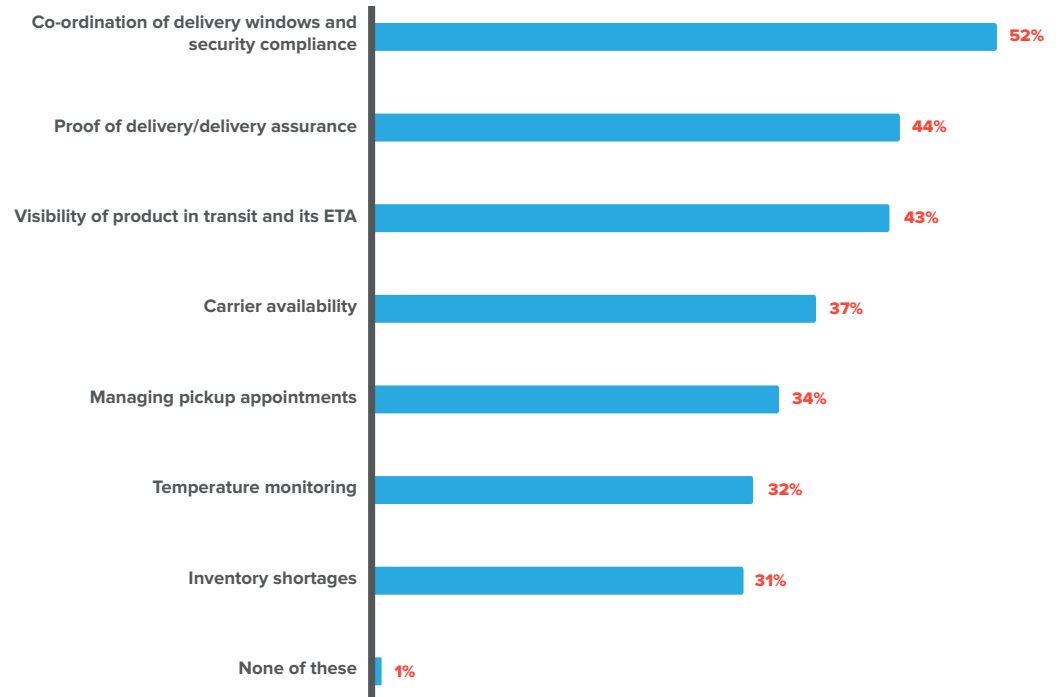
AGILITY AND SECURITY OUTBOUND CHALLENGES

Timing and visibility top the list again.

While pharmaceutical organizations are facing a range of outbound challenges, visibility of the product in transit and ETAs again rank in their top-three concerns along with delivery coordination—only possible with end-to-end visibility. More than half of pharmaceutical supply chain executives surveyed identified coordination of delivery windows and security compliance as their most pressing challenge. Meanwhile, 43% identified visibility of the product in transit and timing as mounting outbound challenges.

37% identified carrier availability as a critical hurdle. Temperature monitoring was also a significant challenge with 32% identifying it as their most urgent concern.

Most Pressing Outbound Challenges





AN EVOLVING SUPPLY CHAIN JOURNEY—FORWARD

The sense of urgency has never been greater.

Like the inbound concern areas, the outbound challenges come at a time when the COVID-19 pandemic has catapulted pharmaceutical supply chains forward to move faster. Consumers with a growing understanding of supply chain—more visible in their day-to-day lives than ever before—have now seen multiple life-saving vaccines fly through R&D, planning, and approval all in under a year. This unprecedented pace and the evolving pandemic raise the question, “are quicker launches the new normal?”

As in any manufacturing situation, quick, high-volume rollouts of new products inevitably creates supply chain pressure for pharmaceutical manufacturers. Launching new treatments in the pharma and life-sciences industries have an additional challenge, however, as fast launches generally mean less flexibility and stability for products. Why? Initial FDA approvals often hinge on maintaining the ideal conditions during transportation, storage and administration, with acceptable margins for environmental conditions or shelf life increasing as further testing is conducted over time.

Supply chain speed and agility are only possible with the stability data of the product at every point to meet these stringent requirements. Visibility solutions must be capable of on-the-fly adjustments to protect demanding and evolving requirements impacted by temperatures, weather, and other outside elements. 68% of pharmaceutical supply chain organizations are already using serialization tracking technology to make agility gains.

COVID vaccines are a use case in innovation.

The International Air Cargo Association (TIACA) Vice Chairman, Sanjeev Gadhia, said, “Global distribution of COVID-19 vaccines is undeniably on track to be the most demanding logistical challenge in history with an estimated 10 billion doses required for distribution until 2022. That number doesn’t account for the onslaught of boosters to come along with evolving variants.”

According to TIACA, investments in digital and physical infrastructure are trending in direct response to the COVID pandemic. This digital infrastructure has proven to be critical in order, PO, and SKU-level tracking of materials and inventory management to maximize vaccine availability and prevent expensive penalties and detention costs. With deeper transparency and actionable data analytics, organizations can track multimodal shipments across multiple carriers by order or PO. Real-time product-level visibility on orders in transit, and optimized forecasting with on-time delivery monitoring across all suppliers, can empower greater precision with an IoT-neutral approach.



16M shipments are needed to vaccinate the entire U.S. population, according to an interview with Operation Warp Speed officials.

Source: The International Air Cargo Association Air Readiness Survey, October 2020





“The goal of real-time visibility is to stitch together complex and siloed supply chains so organizations have better insights to help them run more efficient operations. Real-time visibility platforms are an indispensable piece of the puzzle, and analysts predict that 50% of global product-centric enterprises will have invested in real-time visibility platforms by 2023.”

MATT ELENJICKAL
FOUNDER & CEO
FOURKITES



CONCLUSION: RESILIENCE REQUIRES UNCOMPROMISING VISIBILITY

Real-time visibility is the indispensable piece of the puzzle.

As this study shows, innovation in supply chain technology is the way forward for organizations that want to remain competitive, while providing quality service to the patients and healthcare providers that depend on them. For many supply chain leaders in pharma and other industries, building a “supply chain control tower” is a frequently mentioned goal, and for good reason. Control tower-like solutions can connect many of the technologies mentioned in this report, such as SCV, ERP, WMS and TMS. They promise a clear end-to-end picture of operations in real time, enabling proactive exception management and greater agility. However, in the race to overcome the current challenges facing pharmaceutical supply chains, it is important that companies don’t adopt new technologies without a strategic implementation plan and reliable vendor partnerships, or they might miss out on some of the benefits that each affords.

In a recent article on the future of supply chain tech, Gartner analysts estimated that over 95% of control tower-like solutions deployed in the next two years will fail to reach their full end-to-end potential. This value gap between expectations and reality underscores the importance of partnering with the right solution providers and creating a thoughtful plan for integration. Careful evaluation of business needs and the current state of supply chain systems is a critical step toward success that pharmaceutical supply chain leaders must keep top of mind.

Source: Gartner Predicts the Future of Supply Chain Technology, Sarah Hippold, February 10, 2021



Collaboration is the next supply chain frontier.

With all but 6% of pharmaceutical and healthcare organizations implementing more modern visibility technologies over the next year, demands on talent are top of mind. As legacy systems are retired and new SCV platforms become the norm, it is important to select a provider that supports your workforce in advancing along with the technology—enabling your existing talent to easily adopt cutting-edge solutions.

FourKites' continuing education platform promotes ongoing learning in visibility-related topics for shippers to help their partners and customers maximize the value of supply chain visibility. At FourKites we are investing in the logistics community by doing our part to build technical competencies through a culture of learning.

Continuous learning is a culture.

Based on MIT's method of modular, active learning, FourKites' self-paced courses explore the platform in depth, teaching participants the ins and outs of load tracking, integrations, visibility best practices and tools for success, including notification rules and analytics dashboards. Participants can take only those classes they are interested in, or they can complete four of the six modules to earn FourKites Certification.

The Council of Supply Chain Management Professionals (CSCMP) counts FourKites learning platform classes and certification as part of its continuing education requirements for its own certification process.



“Collaboration is the next frontier in supply chain management, and a robust community is vital to facilitating productive collaboration. This new online certification program is open to anyone in the FourKites community who wants to be on the cutting edge of innovation. By better understanding the FourKites platform and the value of interconnectivity, both within and outside their organization, FourKites-certified logistics professionals can optimize their end-to-end supply chain.”

BOB SLABY
CHIEF CUSTOMER OFFICER
FOURKITES



The FourKites Difference



Optimize Supply Chain Forecasting

Monitor on-time delivery across all suppliers with real-time product-level visibility on orders in transit—even when deliveries are split across multiple carriers.



Dynamically Monitor Temperatures

Increase control and enable a more responsive vaccine supply chain with a powerful view into in-transit temperatures so your team can take immediate action when necessary to preserve life-saving product.



Reduce Transportation Costs

Real-time, in-transit visibility with predictive ETAs enables proactive exception management, saving you costly expediting fees.



Improve Customer Satisfaction

Achieve tighter on-time delivery dates and provide secure, live-tracking dashboards for customers.



Reduce Inventory Costs

Right size your inventory and calculate accurate cycle times with inbound shipment visibility and eliminate the risk of product loss due to damage in transit.





Learn More

For more information, please visit

www.fourkites.com

or contact a FourKites representative at

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