

What Does the Future of Temperature-controlled Pharma Supply Chain Look Like and How Do We Shape It?

Importance of Airfreight for the Pharma Industry

Airfreight plays a vital role in the pharmaceutical industry, especially for economically export-oriented countries like Switzerland. Throughout the pandemic, air cargo actors specialized in the efficient transportation of high-value and care-intensive shipments played a crucial part in ensuring the distribution of vital vaccines and medical supplies, including masks. This highlights the essential role of airfreight in times of necessity.

The transportation of these shipments requires careful consideration of several crucial factors, including service excellence, dependability, swiftness, security, and meticulous temperature regulation. Also, transporting these highly sensitive shipments with limited lifespans demands reliable services and clearly defined processes. Due to the products' lifespan, it is very important to offer a stable and reliable network. This should be complemented by quick turnaround times, short acceptance times, and rapid execution of transfers and deliveries.

The Future of the Pharma Logistics Industry

What can we expect in terms of the future development of such shipments?

The pharma and healthcare transport business grows continuously, offering many opportunities as well as challenges. In addition, customer demands will continue to grow and get more complex in the future; as a result, all actors involved will need to ensure their preparedness to offer solutions that correspond to these changing dynamics.

For example, to address the present and expanding trends within the industry, all actors involved would need to actively engage in industry forums, conferences, and collaborations. This will ensure they remain informed about the most recent developments and play a role in shaping forthcoming standards and practices.

In the area of the temperature-controlled pharmaceutical supply chain we can expect significant advancements and transformations in the future, driven by (1) technological innovations, (2) regulatory changes, and industry demands regarding (3) sustainability, (4) resilience, (5) education & collaboration.

Below we will dive into these trends and factors that could shape the future of the pharma logistics sector, along with strategies to proactively shape this state.

1. Technological Advances

First of all, technological advances such as digitalisation are bringing changes with them:

A. Advanced Temperature Monitoring and Control

The supply chain landscape has evolved through the integration of IoT sensors for real-time monitoring of temperature and environmental conditions during storage and transportation. This technology, coupled with data analytics and AI, ensures continuous oversight and prompt intervention in case of temperature deviations, enhancing the reliability and visibility of the entire supply chain. This synergy of IoT and AI marks a significant advancement in supply chain management, minimising risks and optimising processes.

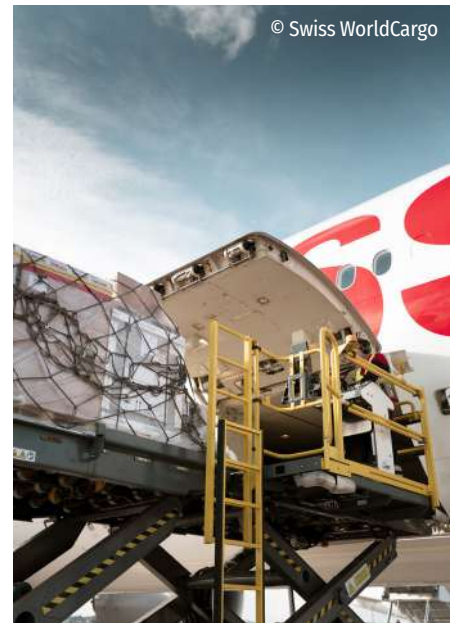
B. Blockchain and Digitalisation

Utilising blockchain technology ensures the establishment of a transparent supply chain record, maintaining data accuracy and regulatory compliance. The digitalisation of these supply chain processes further facilitates seamless tracking, traceability, and accountability throughout the entire journey.

C. Cold Chain Logistics Innovations

The pandemic acted as a catalyst for digitalising the complete supply chain process, including everything from demand management to shipment flows.

For example, the development of innovative packaging materials and insulation technologies to ensure prolonged temperature stability will also impact the industry. Additionally, in the future, autonomous vehicles and drones might be



employed for temperature-sensitive last-mile deliveries, reducing transit time, and increasing efficiency.

A future strategy in the pharma logistics industry should therefore also focus on technological integration. In fact, digital transformation is fundamental for global supply chain progress. The challenge is that, considering various external interfaces, certain freight processes, e.g. clearance documentation, still rely on non-digital methods. Nonetheless, collaborative initiatives are on their way with the aim of minimising paper-centric freight handling. Furthermore, advancements in IoT, AI, blockchain, and data analytics are vital because they will bolster supply chain precision, visibility, and efficiency. For example, by placing emphasis on electronic and web-based technologies, the goal is to enhance transportation processes, resulting in improved visibility of shipments and heightened excellence in the pharmaceutical logistics supply chain.

2. Global Regulatory Logistics Standards

In addition to technological transformations, the airfreight industry is also confronted with regulatory changes.

Maintaining regulatory compliance remains paramount as there will be increased enforcement for product quality

and patient safety. Ensuring product integrity by adhering to temperature requirements throughout transportation is critical also due to stringent global regulations in handling pharmaceutical and healthcare items. Industry collaboration aims to create worldwide strategies to ensure that standards for pharmaceutical logistics supply chains are respected at all times, optimising supply chain processes.

In response to these regulatory shifts, an appropriate strategy for the near future involves staying informed about the evolving regulatory requirements and maintaining strict adherence to quality and safety standards. This proactive approach helps ensure compliance while upholding the highest levels of quality and safety in operations.

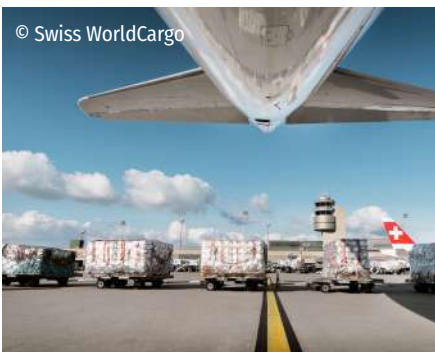
3. Sustainability and Environmental Consideration

Furthermore, sustainability demands are also increasing and, as a result, the industry is moving towards adopting environmentally friendly packaging materials, refrigerants, and containers to minimise the ecological impact of temperature-controlled logistics operations. This initiative goes hand in hand with the focus on reducing energy consumption and carbon emissions throughout the entire supply chain.

In the airfreight industry, the journey towards greener cold chain logistics relies on data, innovation, and collaboration. Data empowers us with tools like transparent carbon emissions tracking and AI-optimised routes. Innovation introduces new solutions like lightweight packaging and recycling initiatives across the value chain. Collaboration is vital, uniting stakeholders for a collective impact on this important journey.

4. Supply Chain Flexibility and Resilience

Additionally, in order to navigate the present and shape the future of pharmaceutical logistics, a resilient supply chain and solid risk management is required.



In fact, in response to unforeseen disruptions like natural disasters or pandemics, there is a growing trend towards the establishment of more flexible supply chain models that allow companies to respond swiftly. Additionally, the diversification of sourcing locations and suppliers is being pursued as a means to mitigate risks effectively.

For these reasons, in anticipating the future, a focused approach that includes risk management is essential: In the airfreight industry, we aim to craft comprehensive strategies that address potential disruptions to ensure business continuity. This proactive stance empowers us to navigate complexities and maintain a steady course even in the face of challenges.

5. Education & Collaboration

Finally, increased education and collaboration are factors that will bring about various changes, shaping the future of the temperature-controlled pharmaceutical supply chain sector.

A. Education and Workforce Development

To navigate the evolving temperature-controlled supply chain effectively, there's a need to invest in educating and training a skilled workforce. This preparation will enable experts to competently and effectively manage the complex technologies and processes required in this dynamic industry.

B. Collaboration

Here, in recognising the significance of collaboration among stakeholders in cold chain logistics, a shared vision has emerged. For this joint purpose, active interaction with regulatory bodies, industry associations, and advocacy groups remains a priority.

In fact, air cargo experts, manufacturers, distributors, logistics providers, and regulators, are increasingly collaborating to share best practices, which will then result in an enhanced synergy. These partnerships are being formed to optimise supply chain operations, reduce waste, and thereby improve overall efficiency levels. This effort involves for example eliminating data duplications, reducing paperwork, and strengthening air cargo security while offering better shipment visibility.

Conclusion

In conclusion, the future of the temperature-controlled pharmaceutical supply chain is marked by technological innovation, regulatory compliance, sustainability efforts, supply chain flexibility, and collaborative



partnerships. Airfreight's vital role during the pandemic underscores its importance in this industry. Advanced technologies like IoT, AI, and blockchain will enhance monitoring and transparency. Conforming to changing regulations, adopting sustainable practices, and building resilient supply chains are additional essential strategies. Education and collaboration will drive workforce development and industry-wide improvements. By embracing these trends, the pharmaceutical supply chain is set to guarantee efficient and secure delivery of crucial medical supplies in the years to come.



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Susanne Wellauer, Vertical Industry Pharma & Healthcare representative at Swiss WorldCargo, began her career at Swissair in 1996 as Cargo Expert in Basel. Since then, she has held several Sales and Marketing positions at Swisscargo and Swiss WorldCargo based in Switzerland. Before being appointed Vertical Industry Pharma & Healthcare representative in 2014, she was the Cargo Manager for the Basel region. In her current role, she monitors the industry needs and trends on a global scale and liaises closely with cold chain experts at freight forwarding companies, as well as with major pharmaceutical and healthcare companies.