



The Future of Pharma Distribution

Emerging trends and challenges in pharmaceutical distribution underscore the need for ongoing logistics network validation

Position Paper

Main drivers and challenges currently impacting the pharmaceutical industry

The pharmaceutical industry is undergoing a **fundamental transformation driven by innovation, competition**, and regulatory shifts. Start-ups with disruptive business models are entering the market and drastically accelerating development cycles. The process of developing medications and vaccines used to take years. However, advancements in mRNA technology during COVID-19 have revolutionized R&D, significantly accelerating production cycles. Traditional pharmaceutical companies now face the challenge of keeping up with the agility and speed of these emerging competitors.

Pharmaceutical companies are increasingly challenged by **fragmented operations**, where **products** are developed and **packaged to meet the specific regulatory requirements of individual countries only**. This siloed approach creates inefficiencies, making it difficult to streamline distribution across entire regions with a single product. As market demands shift rapidly, the need for greater flexibility in packaging and labeling has become more pressing. To remain competitive and compliant, companies must embrace adaptable solutions that accommodate varying regulations while ensuring the agility to respond swiftly to last-minute market needs across multiple countries.



Accelerated innovation drives market pressure

New market players with disruptive business models are increasing competition and driving short development cycles



Fragmented packaging practices drive network complexity

Product packages and labels are often developed to meet country-specific requirements; complicating regional distribution



Personalized medicines drive individual treatments

Focus on genetically adapted therapeutic approaches increases pressure for approval procedures and time to market



Digital transformation drives healthcare 4.0

AI & big data enable early detection of diseases, evaluation of data, and support R&D to develop preventive therapies

Meeting challenges of rapid development cycles and personalized therapies in a changing market

Personalized medicine enables individualized treatment by tailoring therapies to a patient's genetic profile, presenting new challenges for pharmaceutical companies. To stay competitive, they must evolve beyond traditional therapeutics and expand into comprehensive services involving diagnostics and biomarkers. The increasing need for personalized therapies is pushing approval systems to expedite processes while maintaining safety standards. At the same time, there is a pressing need to develop new methods for data collection and verification to meet these evolving requirements. Moreover, time to market has become a critical factor, with efficient logistics networks playing a pivotal role in controlling and accelerating this process, ensuring timely delivery of therapies to patients.

The **digital transformation** is revolutionizing the healthcare industry and offers enormous potential for R&D. Artificial intelligence (AI) and big data play a central role by enabling the early detection of diseases and shortening development cycles. Leading countries such as the USA and China are investing heavily in these technologies. AI can analyze patient data and develop preventive therapies that are specifically tailored to the patient's genome. Tech giants such as Google and Facebook are contributing their technical expertise and investing heavily in R&D.

“Reevaluate fragmented operations and **build agile logistics networks** capable of addressing the demands of personalized medicine, navigating regulatory complexities, and responding to rapidly changing market needs”

Logistics needs shaped by the latest trends in the pharmaceutical industry

Adapting pharmaceutical logistics: Requirements continuously lead back to a review and optimization of the logistics network

1

Increase supply chain transparency through effective cold chain mgmt.

The logistics for pharmaceutical products place high demands on temperature control during transport and storage. Due to their sensitivity, medicines and vaccines must be maintained within a precisely defined temperature range, requiring specialized monitoring and control systems to comply with regulatory standards. Some products need ultra-low temperatures, requiring special refrigeration equipment or packaging making distribution more challenging. It is crucial to consider capacities to avoid bottlenecks and ensure the right logistics partners and service providers are in place.

Efficient cold chain management involves designing validated systems, monitoring with sensors and continuous improvement through audits. Innovative approaches such as smart packaging enhance product insulation, shock resistance, and traceability, are crucial for quality assurance in pharmaceutical logistics and increasing end-to-end supply chain transparency.

The distribution of cold chain products should be carefully planned and integrated into logistics networks as their high requirements can drive logistics expenses heavily.

2

Re-structure logistics processes to overcome the rising demand

As the demand for personalized medicine increases, logistics and its networks must evolve and shift towards a closed-loop system rather than a unidirectional flow towards the customer. For example, when cells are extracted from a patient, sent to a lab, and returned to the same patient, this closed-loop approach is essential. Key factors to consider include expanding the infrastructure by investing in specialized storage and transport solutions for temperature-sensitive and time-critical products.

Additionally, to ensure faster and more efficient operations, logistics processes need to be optimized. This involves a thorough review and adjustment of current methods. Furthermore, building and maintaining strong partnerships with specialized logistics providers and healthcare facilities is vital to ensure seamless service delivery.

By addressing these requirements, the logistics sector needs to meet the high standards of personalized medicine, ensuring high-quality patient care, with an increased emphasis on safety and a zero-error policy, as logistical errors could be life-threatening for patients.

3

Boost pharmaceutical supply chain resilience through real-time data

Pharmaceutical companies face an annual loss of approximately 35 billion US dollars due to temperature-related product issues. The increasing demand for mRNA and personalized medicine suggests that this loss will likely increase.

Worldwide pandemics, along with natural disasters and channel blockages have emphasized the urgent need for real-time transparency in the industry. This transparency can be achieved through a control tower, which integrates real-time data from carriers, temperature data from data loggers, IoT-enabled devices, suppliers, and other sources to provide status updates.

By gathering and analyzing this data, companies can identify problematic events, such as shortages of active pharmaceutical ingredients (APIs). Over time, the data collected by the control tower can improve network resilience and pinpoint specific risk sources. Targeted route analyses can reduce the likelihood of failures, improve timeliness, and optimize packaging for more cost-efficient shipping.

4

Transform logistics networks to cover product portfolio requirements

Pharmaceutical companies are shifting from focusing solely on therapeutics to offering comprehensive services, including diagnostics and biomarkers. This evolution significantly changes their portfolios, prioritizing specialized medicine over generics.

These changing portfolios will profoundly impact logistics and distribution networks. Companies must reassess warehouse strategies, determining the optimal number and location of facilities. With an expanding range of products, including biologics and cold chain medicines, they also need to rethink their supply chain structures and network.

Key questions include the necessity of warehouses in each country and the distribution based on product characteristics. The debate between centralized and decentralized models is crucial. Centralized warehouses often provide efficiency synergies and inventory savings by consolidating local warehouses. This transformation requires careful planning and strategic investments in infrastructure and process optimization.

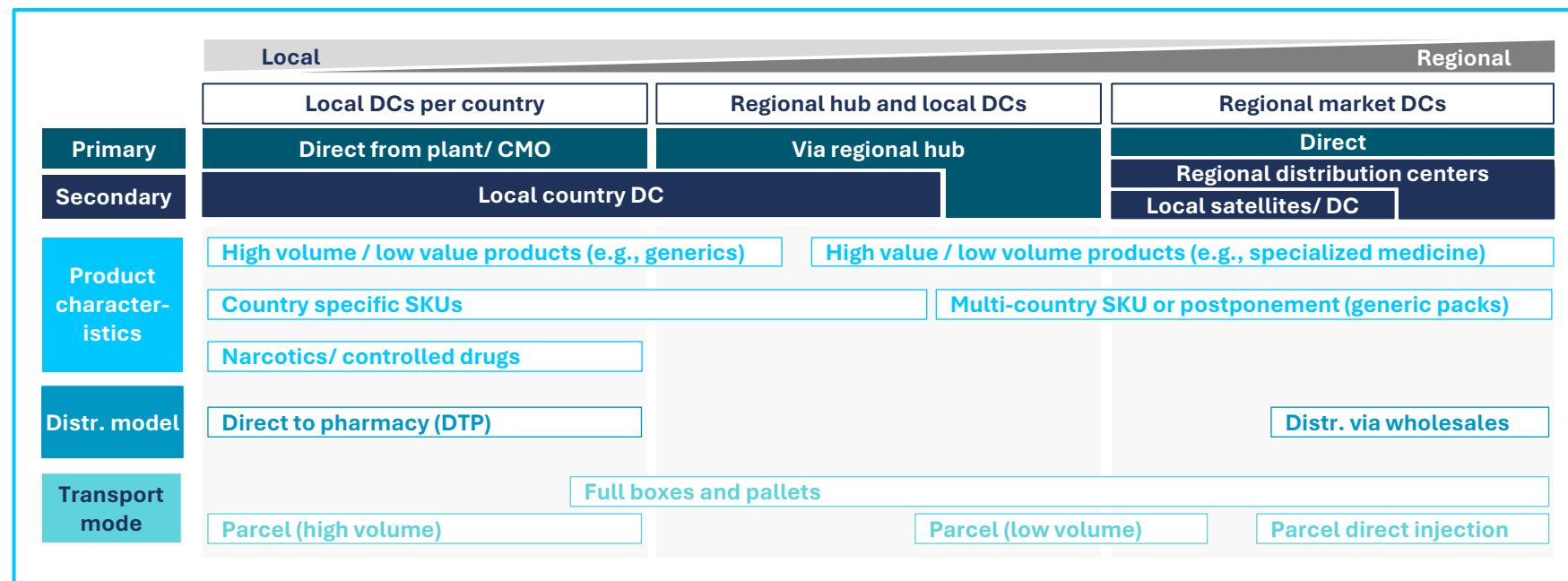
Supply Chain Networks across Europe

Trends in pharmaceutical supply chain networks: Balancing local and regional models to boost operational efficiency and improve inventories

Pharmaceutical and medical device clients are **increasingly prioritizing a thorough grasp of their supply chains and logistics network**, recognizing that adapting strategies to market changes and aligning with business goals are crucial for optimization. Traditional local country setups, with high volumes and direct deliveries to customers, are being replaced by regional distribution centers (RDC) models. This shift benefits companies distributing mainly via wholesalers or those with specialized biotech products, characterized by low volume and high value. Business cases for these changes highlight increased efficiency and inventory savings from **consolidating local warehouses into larger regional DCs**.

However, this does not apply to all areas within Europe, especially in Western Europe, companies often have extensive DC footprints, with **large countries having their own local DCs that may also serve neighboring nations**. A common example is that a German DC might serve Austria. Eastern Europe and the Nordics are leading in consolidation. Hungary is commonly used as a sub-regional DC, serving multiple countries, while high-volume markets like Greece, Poland, Russia, and Turkey maintain dedicated facilities. In the Nordic countries, consolidation is common, with Denmark and Sweden as key hubs. This strategy optimizes pharmaceutical logistics across Europe.

Simplification of typical use cases within distribution networks:
Best size of a distribution network is dependent on the product characteristics and the end-customer distribution model



Client Example

Creating a streamlined, growth-ready logistics network for a healthcare company in Europe, with lower costs, reduced inventory, and improved service performance

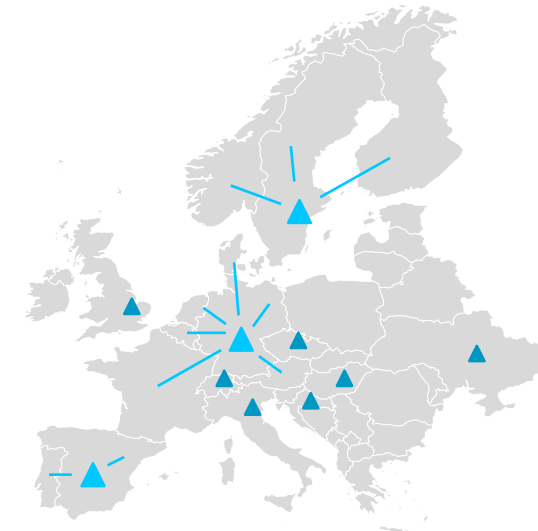
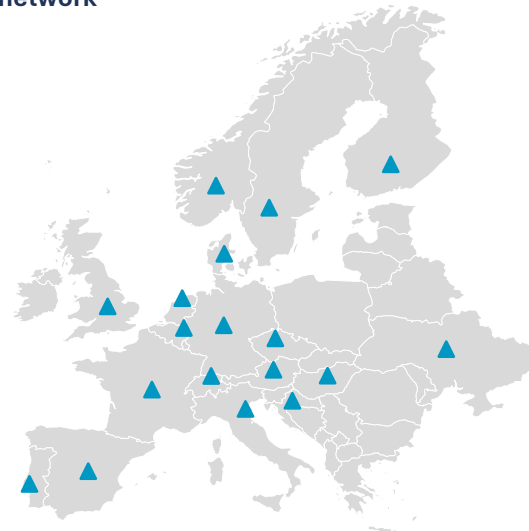
Client problem statement

A healthcare company faced significant challenges in its distribution and logistics network, which is **not effectively supporting growth** and operational efficiency. **Supply chains operate in silos**, lacking integration and synergies across different business units. Lack of transparency in service and cost performance hinders optimization efforts. As the company expands into new markets, the **logistics network becomes increasingly fragmented**, leading to **inefficiencies in distribution**. **Rising logistics costs**, particularly driven by **high fixed warehousing expenses**, further add to the challenge. **High inventory levels** across **multiple stockholding points** complicate planning and forecasting. Frequent backorders and delivery failures further impact reliability.

To enable sustainable growth, a unified, long-term warehousing and network strategy is essential to enhance efficiency, reduce costs, and improve overall supply chain performance.

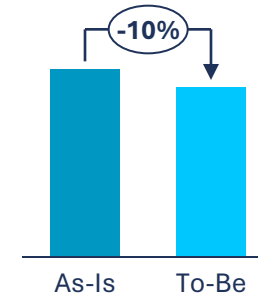
Transformation of warehouse foot-print by redesign of logistics network

As-Is logistics network in Europe, ~18 WHS, acting without synergies between business units, focus on local country requirements only

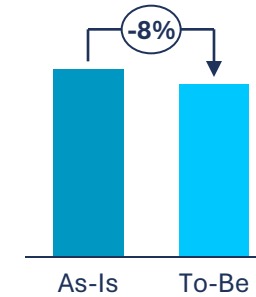


- ▲ LDC (Local Distribution Center)
- ▲ RDC (Regional Distribution Center)

Benefits and results achieved



Inventory level



Distribution costs

- + **Reduce stock-holding- and touch-points**
Simplify replenishment process
- + **Reduce supply chain complexity**
(by closing 9 of 18 WHS)
- + **Improvement of service level (+5 points)**
by stock availability and **safety stock bundling**

Performance & Service

Assessing and redesigning logistics networks for a competitive future

Optimizing supply chain networks to enhance efficiency and adaptability in a rapidly evolving industry

The pharmaceutical industry is undergoing a major transformation driven by innovation, competition, and evolving regulatory landscapes. Fragmented operations, where products are developed and packaged per country-specific regulations, create inefficiencies. Personalized medicine and digital transformation are further reshaping supply chains.

To remain agile and competitive, companies must rethink their logistics networks, ensuring they align with shifting customer demands and regulatory requirements. A well-structured network enables flexibility, cost-efficiency, and resilience in an increasingly complex market. Efficient management of the cold chain, robust infrastructure investments, and strategic partnerships with specialized logistics providers are essential to meet these challenges effectively.

It requires a strategic approach that not only supports efficient supply chain operations but also positions companies to capitalize on opportunities.

Invest in a future-ready supply chain and logistics network to stay ahead of emerging pharmaceutical industry trends and ensure long-term adaptability



Warehouse optimization

Evaluate the number of warehouses to increase efficiency. An imbalance in facilities affects costs, availability, and scalability. A strategic approach enhances long-term growth.



Strategic distribution

Optimizing warehouse locations strengthens distribution. Well-placed facilities reduce lead times, boost responsiveness, and support expansion.



Product allocation

Placing products correctly enhances logistics. Grouping similar products, like cold chain goods or controlled drugs, improves supply chain performance.



Regulatory compliance

Adhering to regulations across regions is crucial. A streamlined network minimizes unnecessary cross-border shipments while ensuring full compliance.

Camelot Management Consultants

We are a global management and technology consulting firm focusing on value chain management. Our mission: turning our clients' value chains into a competitive advantage and creating lasting impact where our clients need it most. By combining our industry focus, value chain process expertise, and technology know-how, we guide our clients from strategy to sustainable technology adoption.

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Why Camelot

- Camelot combines **logistics expertise** with supply chain solution knowledge and many years of experience in the focus industries chemicals, life sciences, CPG, and industrial manufacturing
- Camelot provides a systematic assessment approach to discover **use cases** and the **benefits** involved
- Camelot regularly scans the **artificial intelligence solution market** and has experience in integrating a variety of solutions

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