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Once supply chains become fully digital, AI will unlock efficiencies we never imagined.

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SkyCell is at the forefront of a fundamental shift in pharmaceutical logistics, where AI, real-time monitoring, and sustainability are no longer optional but essential. As pharmaceutical supply chains grow more complex, the need for precision, resilience, and carbon-conscious innovation has never been greater. With AI-driven optimization redefining efficiency and risk management, the industry is on the verge of an unprecedented transformation.

What is the background of SkyCell, and how has it evolved into a global leader in pharmaceutical logistics?

Founded in January 2013 after two years of intensive research and development, SkyCell was born from a clear industry need: as pharmaceutical manufacturing transitioned from chemical compounds to biologics, conventional packaging no longer provided adequate protection. My co-founder, Nico Ros', civil engineering company which specialized in pharmaceutical manufacturing systems identified this shift early on. Recognizing the growing demand for more sophisticated and sustainable packaging, we committed to developing a solution that would not only enhance performance but also address long-term environmental considerations.

Our journey began in Europe, but our first major international breakthrough came in Japan — a market known for its uncompromising standards. Entering such a selective and quality-oriented environment required more than just advanced technology; we had to win their trust. We made

multiple visits, engaged in in-depth discussions and consistently demonstrated that SkyCell was not just technologically superior but also a reliable global partner.

Winning over our first major international client was a turning point. By proving that we could deliver precision, reliability, and long-term stability, we not only secured their confidence but also laid the foundation for global expansion. This success opened doors to new markets, including the US and Singapore, and set the stage for our continued growth.

Today, SkyCell operates across more than 30 pharmaceutical clusters, facilitating the safe, secure, and sustainable distribution of temperature-sensitive medicines to approximately 100 countries. By combining high-performance hybrid containers with advanced monitoring and logistics services, we ensure pharmaceutical products reach their destination safely, solidifying our position as a trusted partner in global pharma supply chains.

How is Switzerland strengthening its position as a global hub for pharmaceutical logistics?

Switzerland has long played a pivotal role in pharmaceutical manufacturing, bolstered by its pro-business environment, streamlined regulatory processes, and commitment to excellence. As global pharmaceutical companies expanded their footprint through acquisitions and strategic investments, key production hubs have emerged in countries such as Puerto Rico, Ireland, Singapore, Belgium, and Switzerland. These locations, often characterized by their small size and business-friendly policies, have become integral to global pharmaceutical supply chains.

Switzerland, in particular, consistently ranks as a preferred choice due to its ability to fast-track approvals, rapidly establish high-specification manufacturing facilities, and maintain an unparalleled level of reliability. This emphasis on efficiency extends beyond manufacturing to pharmaceutical logistics, where securing partnerships with major industry players demands more than just technological superiority. Companies must provide end-to-end solutions that not only optimize cost and mitigate risk but also address the growing imperative of sustainability.

While the pharmaceutical sector has historically managed cost and risk with precision, temperature excursions remained a significant challenge with two to four percent of shipments affected, leading to potential product losses. SkyCell’s advanced technology has redefined industry standards, reducing this temperature excursion rate to below 0.05 percent, a transformational improvement that underscores our commitment to reliability and innovation.

Initially, our expertise was focused on oncology treatments, which demand the highest level of temperature control due to their sensitivity and value. Over time, we scaled our capabilities to accommodate vaccines, which now constitute a substantial share of our shipments. Diabetes treatments are emerging as the next major category requiring high-performance, temperature-controlled solutions, reinforcing the critical role of secure, sustainable, and technologically advanced logistics in the global pharmaceutical industry.

How does SkyCell optimise its operations across product segments and global markets?

Rather than investing in specific pharmaceutical categories, our focus is on developing advanced logistics solutions that address the distinct challenges of various product segments. Vaccines, for instance, require specialized handling due to their heavy pallet loads and widespread distribution to regions with extreme climates and underdeveloped infrastructure.

Our expertise in managing such complexities began in markets like Brazil, where prolonged customs often jeopardize shipment integrity. To mitigate these risks, we designed containers capable of independently maintaining temperature stability for over 270 hours, far exceeding the industry standard of 120 hours. Additionally, our hybrid technology enables automatic recharging in cold chain environments, extending protection without manual intervention and ensuring resilience against unexpected delays.

Traditionally, pharmaceutical companies have relied on two primary logistics models: disposable packaging which still accounts for 70 percent of industry shipments, and reusable containers which represents the remaining 30 percent. However, most reusable systems are designed for airport-to-airport transport, requiring temperature-controlled trucking before and after flights. This approach carries inherent risks in emerging markets, where infrastructure challenges can compromise the cold chain. From the outset, our goal has been to offer a true door-to-door solution, eliminating unnecessary handling and ensuring that pharmaceutical products remain protected from the manufacturing site to the final distributor, regardless of location.

Beyond safeguarding shipments, sustainability has been a fundamental driver of our innovation. By reducing our container weight to 379 kilograms, we have not only optimized costs but also significantly lowered carbon emissions—cutting CO_2 output by approximately 50 percent compared to traditional RKN containers. Depending on the shipping route, this reduction translates to savings of between five and 15 tons of CO_2 per shipment, amounting to an annual reduction of 50,000 to 60,000 tons globally. As the pharmaceutical industry increasingly prioritizes sustainability, such

advancements offer a tangible way to align logistics with environmental commitments.

Effectively implementing these innovations requires collaboration across multiple stakeholders. While pharmaceutical manufacturers ultimately decide on logistics solutions, their successful deployment depends on freight forwarders, airlines, and supply chain partners working in alignment. By ensuring that all key players are informed and equipped to integrate new technologies, we support more efficient, reliable, and sustainable pharmaceutical logistics on a global scale.

What importance does sustainability hold in your work?

Sustainability has become a defining factor in pharmaceutical logistics, with Scope 3 emissions generated across the supply chain now accounting for approximately 90 percent of a product's total carbon footprint. While pharmaceutical companies have made significant progress in reducing direct operational emissions in Scope 1 and 2, addressing supply chain emissions presents the greatest opportunity for meaningful impact.

Our strategy to drive this transition is twofold. First, we focus on intelligent supply chain planning by partnering with Validaide, the leading platform for lane risk management. Traditionally, logistics decisions have been based on cost and risk, but integrating CO_2 emissions data allows companies to make more informed choices. If two routes offer the same cost and reliability but one produces 50 percent less CO_2, the sustainable option becomes a natural choice. Our goal is to embed this mindset across the industry, ensuring sustainability is considered alongside efficiency and risk mitigation.

Second, we are introducing our Net ZERO Reverse offering, which aligns with the strictest carbon reduction standards. Achieving net zero requires cutting emissions by at least 90 percent with the remainder removed through certified carbon removal projects rather than conventional offsetting. A key component of this offering is shifting empty container returns from air to ocean freight, significantly reducing emissions while maintaining operational efficiency.

The impact of this strategy is impressive. On long-haul routes such as Europe to Argentina or New Zealand, traditional logistics methods generate up to 15 additional tons of CO_2 simply from returning empty containers, effectively doubling emissions per shipment. By leveraging ocean freight and carbon removal investments, we dramatically reduce this footprint, delivering both environmental and financial benefits. Given that compensating for CO_2 emissions costs at least

USD 80 per ton, the savings per shipment quickly scale into the thousands, strengthening the economic case for sustainability.

Implementing a transformation of this scale requires significant investment. We have expanded our container fleet and established rigorous auditing mechanisms to provide full transparency and verifiable emissions reductions. While most pharmaceutical companies have committed to net zero by 2030 or 2035, translating these goals into actionable, measurable strategies remains a significant challenge. By offering both data-driven decision-making tools and practical carbon reduction solutions, we help bridge this gap, turning sustainability from an aspirational target into an operational reality.

AI and digitalization are hot-button issues in every industry, but just how redefining can they be in pharma logistics?

The pharmaceutical industry is shifting from reactive supply chain management to proactive, intelligence-driven logistics, powered by real-time data, AI, and Internet of Things (IoT) technologies. By integrating real-time monitoring, predictive analytics, and automated interventions, these advancements are reshaping how pharmaceutical shipments are managed, ensuring greater efficiency, reliability, and risk mitigation.

A major challenge in pharmaceutical logistics has been fragmented communication across stakeholders, often delaying critical interventions. To solve this, we teamed up with Microsoft to integrate our AI-powered logistics platform, SkyMind, with Microsoft Teams and Copilot. At the core of this integration is K.AI, our intelligent assistant built on Azure AI Foundry, which continuously monitors shipments, assesses risks, and recommends real-time actions. Whether it’s a missed connection or a temperature deviation, K.AI ensures critical insights reach the right people instantly eliminating email chains, breaking down data siloes, and enabling faster, smarter decisions across the supply chain.

Equally crucial is real-time shipment tracking, which requires highly reliable, cost-effective sensors. Recognizing a gap in available solutions, we developed our own Long Range Low Energy Protocol (LoRa) based IoT tracking system, now deployed across 255+ airports globally. This technology enables continuous temperature and location monitoring at a fraction of traditional costs, making real-time tracking more accessible and scalable for the pharmaceutical industry.

Before introducing this solution to pharma, we first implemented it in airline logistics, where we now track over 110,000 airline assets worldwide. This allowed us to refine the system in a high-demand environment before rolling it out for pharmaceutical shipments. Today, we offer shipment-level monitoring that is independent of packaging type, ensuring seamless tracking and intervention whether using SkyCell hybrid containers, thermal blankets, or other solutions. AI continuously evaluates shipments, anticipates risks, suggests preventive actions, and escalates alerts when intervention is required.

This represents a paradigm shift in pharmaceutical logistics. Traditional USB data loggers, which only provide post-shipment insights only, are being replaced by real-time, AI-driven monitoring systems that enable predictive risk management and automated intervention. By moving beyond passive tracking to intelligent, responsive logistics, we are redefining how pharmaceuticals are transported, enhancing supply chain resilience, efficiency, and security on a global scale.

How does SkyCell harness data to drive continuous improvement in pharmaceutical logistics?

Continuous optimization is at the core of our approach to pharmaceutical logistics, driven by a Kaizen mindset that prioritizes ongoing improvement through data-driven insights. By collaborating with pharmaceutical companies, freight forwarders, and airlines, we refine supply chain processes, eliminating inefficiencies while enhancing cost-effectiveness and sustainability.

Through Validaide’s lane risk assessment, companies can evaluate transport routes to determine whether temperature-controlled trucking is essential, balancing cost, risk, and carbon impact without compromising product integrity. Complementing this, our IoT-driven real-time monitoring provides live shipment insights, enabling proactive interventions that prevent disruptions rather than merely responding to them.

This integrated approach combines strategic planning, execution, and analytics and has delivered up to 20 percent cost savings and a 30 percent reduction in carbon footprint. By continuously refining these innovations across all modes of transport, we are setting new standards for efficiency, resilience, and sustainability in global pharmaceutical logistics.

What makes your company stand out in a highly competitive landscape?

Unlike traditional logistics giants such as UPS and DHL, SkyCell is a technology-driven partner specializing in temperature-controlled pharmaceutical logistics. Our approach combines innovative container solutions, real-time monitoring, and data-driven optimization. Rather than competing with freight forwarders or airlines, we collaborate with them, ensuring pharmaceutical companies benefit from the highest standards of efficiency, security, and compliance.

We maintain partnerships with all major international airlines as well as many smaller regional carriers. On the freight forwarding side, we work with both global leaders and specialized regional providers, facilitating seamless supply chain management across diverse and often complex logistics environments. Our direct engagement with pharmaceutical companies is extensive with 14 of the world’s top 20 pharmaceutical firms use our solutions, alongside nearly 60 others and over 100 pharmaceutical suppliers that rely on precise, outsourced logistics solutions.

Pharmaceutical supply chains are highly decentralized, with different divisions operating independently based on product-specific requirements. Oncology treatments, vaccines, and animal health products each demand tailored technology-driven logistics strategies. Notably, animal health logistics has become an emerging focus, given that many veterinary medicines share the same temperature sensitivities as human pharmaceuticals. As regulatory oversight in this sector intensifies, we are well-positioned to support its growing complexity. By combining global reach with specialized, technology-enabled logistics, SkyCell offers a differentiated approach that ensures efficiency, security, and sustainability across the pharmaceutical supply chain, setting a new benchmark in the industry.

Can you share some of your strategic priorities for the near-term and your broader vision for the future of pharma logistics?

As we move into 2025 and 2026, our primary objective is to fully digitalize pharmaceutical supply chains, eliminating the inefficiencies caused by fragmented data and manual processes. Today, companies rely on multiple disconnected data sources, often managing information via spreadsheets and emails. By transitioning to a seamless, real-time digital ecosystem, we enable greater agility, cost efficiency, and risk management while significantly enhancing sustainability and supply chain resilience. A fully integrated digital infrastructure will not only streamline operations but also allow pharmaceutical companies to anticipate disruptions, optimize inventory, and drive long-term efficiencies.

Beyond digitalization, our growth is driven by the increasing need for temperature-controlled pharmaceutical logistics in new and underserved markets. Many essential medicines remain unavailable in regions where they are most needed. A recent example is our exclusive shipment of a dengue vaccine, which initially launched in just three countries. As this disease is e widespread in over 20 additional markets, expanding access to critical treatments like this is an ongoing priority. As pharmaceutical companies introduce more temperature-sensitive products, the demand for advanced, secure distribution solutions continues to rise.

At the same time, supply chain reliability remains a critical challenge. Many pharmaceutical companies operate with a risk-averse mindset, accepting a two percent annual product loss as an industry norm. However, the consequences extend far beyond direct losses. Unreliable supply chains force companies to stockpile excess products, driving up inventory costs and emissions. By improving supply chain visibility and reliability, companies can reduce excess stock levels by hundreds of millions of dollars, improving both cost efficiency and environmental impact.

Looking ahead, AI is poised to reshape pharmaceutical logistics. Once supply chains are fully digitalized, AI will drive predictive analytics, dynamic risk management, and smarter cost optimization. Over the next few years, we expect to see groundbreaking advancements that will make supply chains faster, more intelligent, and more sustainable than ever before. SkyCell remains committed to leading this transformation, ensuring that the next evolution in pharmaceutical logistics not only enhances efficiency and security but also contributes to broader healthcare access and global sustainability.

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