

## A Patient-Centric Supply System

(Source: Dr. Madhav Durbha, Vice President, Industry Strategy with Kinaxis)

The following are edited excerpts of Dr. Durbha's takeaways from the LogiPharma Europe 2018 Conference this April in Montreux, Switzerland:

1. *Patient-centric networks are reshaping pharma supply chains.* In a presentation by Philippe Francois, global head of supply chain for Novartis, Mr. Francois observed that while pharma companies have been talking about patient centricity for years, a typical pharma supply chain links the Active Pharma Ingredient (API) to manufacturing, distribution, retail/pharmacy, and finally to patient, with the patient always at the end of the chain. He talked about how cell and gene therapies are personalizing medicine, putting individual patients at the center of the supply network.

Mr. Francois discussed the specific example of CAR-T cell therapy for certain types of cancers wherein immune cells harvested from a patient are reengineered at a production facility and are then reinjected into the patient so the reprogrammed cells fight cancer. In this instance, the supply chain begins and ends with a specific patient, providing an extreme example of personalized medicine. Given that the cells involved are living, they have very short lifespans and must be shipped in tightly managed, cryogenic conditions in a timely manner. From the moment the cells are harvested, downstream visibility is extremely important with no margin of error.

A day prior to the LogiPharma conference, Novartis announced the acquisition of AveXis, a gene therapy company for US\$8.7 billion. While this announcement brings some very exciting opportunities for Novartis, it shall require a higher level of supply chain competence. Mr. Francois said such advances in personalized medicine are forcing pharma companies to think differently. Also, reimbursements in such treatments are linked to outcomes, placing the patient at the center of economic value.

2. *Lessons from Amazon for pharma companies.* In enabling patient centricity, Philippe Hemard, former VP of Logistics Europe for Amazon, discussed what pharma companies need to learn from Amazon: a) As life expectancy grows, there will be more patients with mobility issues. Delivering the product in the most convenient way, when and where they need it, will be a differentiator; b) Patients will need to enjoy the benefits of same-day delivery, something Amazon has clearly demonstrated is feasible in the non-pharma space; c) Excellence in operations driven by end-to-end visibility into inventory levels will be important. Amazon manages millions of SKUs with such visibility, which is something pharma distribution networks must quickly achieve; and, d) Bring affordability to patients by reducing the costs of delivery.

Mr. Hemard concluded that all of this is easier said than done. Amazon has the scale to manage the distribution in a cost-effective manner. He suggested that it will be interesting to see how pharma rises to the challenge, especially with Amazon's entry into the space looming on the horizon.

(continued on page 2)

## In Brief...

- ◆ In a report released by the **IQVIA Institute for Human Data Science**, opioid prescription dosage volume, as defined by the Morphine Milligram Equivalents (MME), declined by 12% in 2017, the largest annual drop in more than 25 years of measurement.

- ◆ **Procter & Gamble** has agreed to acquire the consumer business from **Merck KGaA** in a deal worth more than €3.4 billion (US\$4.14 billion). This acquisition will allow P&G to further expand its consumer healthcare business by adding Merck's KGaA's fast-growing portfolio of differentiated and physician-supported brands across a broad geographic footprint.

- ◆ Current negotiations between **Sanofi** and pharmaceutical company **Advent International** would allow Advent to acquire Sanofi's European generics division, **Zentiva**. The deal, valued at €1.9 billion (US\$2.32 billion) would form a new independent operation aimed at supporting the Zentiva management team through investment in company operations, production facilities, and R&D pipelines.

- ◆ **Amazon, Berkshire Hathaway** and **JPMorgan Chase** are teaming to create a new independent healthcare company that will aim to lower costs and improve satisfaction among employees. The initial focus will involve tech solutions that can make quality transparent healthcare accessible at a lower cost. This long-term venture would leverage the scale of each organization along with their various specialties. "The healthcare system is complex," *Jeff Bezos*, Amazon founder and CEO, remarked. "Hard as it might be, reducing healthcare's burden on the economy while improving outcomes for employees and their families would be worth the effort."

- ◆ **Takeda Pharmaceutical's** (Japan) revised offer for **Shire Plc** has received preliminary approval by Shire, and will be recommended to Shire shareholders pending further discussions. The offer values Shire at approximately €49 per

(continued on page 2)

## A DHL Report on A.I.'s Potential Benefits

(Sources: DHL, IBM and an article prepared by Nina Chamlou and published by Air Cargo World)

DHL and IBM have released a joint report on the development of Artificial Intelligence (A.I.) technology and its potential to change the logistics industry - noting that, in many ways, A.I. is already making profound changes to the retail environment, not all of which are positive. While there are many ways to define A.I. and many contexts in which the technology is referenced, for our intents and purposes, it can be thought of as the implementation of systems that behave like humans - in that it can automatically address problems, learn how to avoid those problems in the future and produces original ideas.

According to the report, A.I. has already seen success in the integration with the retail end of the supply chain, for instance, allowing e-commerce consumers a shopping experience that is

(continued on page 2)

## Patient-Centric (cont.)...

3. *Concurrent planning breaking down silos.* Brian Thornley of Merck spoke of his organization's journey from siloed, node-to-node planning to concurrent planning. Mr. Thornley shared an example of Merck's efforts: The API was manufactured in China, granulation was performed in Puerto Rico, and then packaging was performed in the Netherlands. Planners were very focused on these individual steps but not on the end-to-end flow.

Now, with concurrent planning, planners not only have end-to-end visibility of the product flow plans, but they can simulate a variety of scenarios. For example, if sales were to increase by 20 percent, or if a piece of equipment goes offline, they can determine if the company will have system-wide ability to support the demand in such a situation and still manage assets and inventory effectively. Planners can now quickly assess impacts and evaluate options based on such scenarios.

4. *Cultivating supply chain planning complexity through automation.* Niall Kennedy of Gilead Sciences spoke about how an integrated supply chain transformation program is helping his company keep pace with the growth in the business. Some of Gilead's drugs contain up to four APIs, with each API having several variants, resulting in significant planning complexity that must consider regulatory compliance with respect to where the lots are made and, based on genealogy, the eligibility as to where the lots are to be sold.

Planners once carried the burden of this complexity on an individual to individual basis as previous planning systems could not account for regulatory constraints. This resulted in plans that were not feasible to execute. Today, Gilead leverages *Kinaxis RapidResponse®* to integrate its regulatory database with supply chain planning. With this tool, the matching of demands to the supply in various stages in the master production schedule integrates regulatory rules, making the plans realistic and feasible.

5. *Pharma supply chain projects are moving from linear to agile.* Several conference presenters commented that their organizations are moving away from linear-style project management to a culture of experimentation. Hussain Mooraj of Deloitte said, "with the "think big, start small, scale fast," approach that he sees more and more companies adopting this model. This observation matches what Mr. Mooraj is seeing in pharma companies and in other industries with which he works. He further suggests that the days of massive implementations with questionable payoff are numbered. We're [the Pharma Supply Chain] tackling more and more projects in smaller chunks, with pay-as-you-go models.

Cloud-based offerings are enabling such consumption models. The rise of cloud-based technologies is evidenced by the number of software vendors, 3PL and 4PL companies in attendance at the conference who were there speaking to the virtues of cloud.

6. *Smart devices enable digital supply chains.* Simon Orchard of Pfizer spoke of the pilot projects his team is working on in the field of GPS-enabled temperature sensing to monitor cold chain logistics. Mr. Orchard also discussed a pilot that leverages drones for inventory cycle counting in warehouses. Instead of conducting labor intensive cycle counts once or twice a year. He described how Pfizer uses drones to perform cycle counts overnight to significantly improve inventory accuracy and reduce labor costs.

Several vendors at the event showcased a variety of IoT (internet of things) devices, most of which provided temperature

and location monitoring and logging such information in the cloud.

The topic of Blockchain is very common in pharma supply chain conferences. However, the author of the article felt it was clear presenters on the topic had more questions than answers. Supply chains for personalized medicine need to operate with 100 percent precision, and in the author's view, Blockchain could very well prove to be useful in such an environment. The high revenue opportunity associated with personalized medicine - with therapies costing hundreds of thousands of dollars - can help justify the investment in the Blockchain technology.

## DHL Report (cont.)...

tailored to their observable preferences via the A.I. technology's self-learning algorithms. In terms of the implications for manufacturing, warehousing and transportation, the scale of the potential uses of A.I. are nothing short of overwhelming due to the scope of data that is now available through Internet of Things (IoT).

With more Industry players incorporating IoT systems, such as automated sorting and item-tracking technology - which is replacing traditionally human labor tasks and simultaneously gathering and storing valuable data - the potential to forecast supply-chain disruptions, like inventory shortages, manufacturing bottlenecks and delays in transit, will mean another leap forward for the industry.

However, in the boosts in efficiency and cost savings, there are more difficult issues that will continue to arise with A.I. implementation, the study noted. The shift toward A.I. and IoT, for example, means jobs traditionally intrinsic to supply-chain operations will either be re-distributed or deemed obsolete. Knowing that the limits of the technology are unforeseeable, it's difficult for anyone to predict the scale in which business operations will become automated and the economic implications of this paradigm shift.

To read the full report, download the report on DHL's website at <https://www.logistics.dhl/global-en/home/insights-and-innovation/insights/artificial-intelligence.html>.

## In Brief (cont.)...

share in a cash/stock deal (roughly €46 billion/US\$55.7 billion.)

- ◆ Global antibiotic consumption jumped 65% between 2000 and 2015 according to a study conducted by the **US Center for Disease Dynamics, Economics and Policy**. The largest user of antibiotics was India, whose consumption leaped by 103% during the 16-year period. The study examined consumption in 76 countries. It was published in the latest "*Proceedings of the National Academy of Sciences*." Significant rises also occurred in China (up 79%) and Pakistan (up 65%).

- ◆ In a report by **Grandview Research**, the global vaccine market is expected to surpass US\$77.5 billion by 2024, an increase of 10.3% from 2013 to 2024. The rise in demand is contributable to developments in healthcare infrastructure and awareness regarding benefits of immunization. A rise in the number of developmental pipeline drugs is expected to propel the vaccine market growth over the forecasted period.

(Sources: BusinessWire, CNBC.com, Drugstore News, Healthcare Global, Pharma Japan, and Scrip)