EXECUTIVE: In a recent survey of manufacturing and supply chain leaders, 80 percent agreed the digital supply chain will be the predominant model within the next five years, and 16 percent said it already is. From what I’m seeing at UPS, there’s a good chance that 16 percent includes quite a few high-tech companies.
High tech, after all, has become a pressure cooker of fast innovation and high consumer expectation for personalized experiences, including flexible delivery at the customer’s choice of speed, time and location. Online consumer sales continue their double-digit growth year-over-year, and predicting consumer buying habits continues to be a challenge.

These newly dynamic behaviors are requiring high-tech companies to instantaneously see patterns within the data picture, and then adjust incentives and inventory levels in response to sales trends.

Hence the need for a digital supply chain, which is all about data. Logistics partners are using advances in supply chain analytics to help high-tech businesses make more sense of data. This is one reason we’re investing $1 billion a year into our technology capabilities. Here are three examples of where I see analytics driving needed change for high-tech supply chains:

- **Faster, More Flexible Delivery**

  Armed with accurate and up-to-the-moment, end-to-end supply chain data, we can help high-tech companies identify fast-selling products, geographic differences in sales density and the most popular sales channels. Doing so enables data-driven decisions about where to position inventory so products can be delivered to most places within a day—or even within hours.

  The goal is to sell, ship and deliver products consumers want, where and when they want them, and to also be able to predict and react to delays. For a smartphone vendor, for example, we must be prepared to ship to a store or directly to a home or office. Another goal is to respond to consumers’ delivery needs, even when they change. Our online delivery app enables consumers to change the time and place of delivery, even after the item has shipped.

A still-evolving delivery innovation at UPS is the use of **smart lockers** in various places, including population-dense locations such as high-rise apartment buildings. Analysis of historical delivery data determines where we locate lockers and how many we install. Customers can also use the lockers for package pickup, such as when a repair is needed. Smart lockers are part of the UPS Access Point network, which includes more than 26,000 places that serve as intermediate delivery locations.

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**Optimizing Risk Management and Opportunity with Supply Chain Analytics**

**SCHOLAR:** High-tech businesses have spent the last decade implementing systems, processes and data-gathering capabilities to improve their supply chain operations. Within the past 12 months, we’ve seen renewed commitment to continue this quest. In my research, 60 percent of the Global 1000 have recently announced initiatives to reduce costs, with a big focus on supply chain efficiency.

How will they do that? By using even more data, applying more advanced analytics and automating more processes.

It starts with data: quality data, fast data, data from all nodes, and even data from points between nodes (from sensors on trucks and train cars, for example). Then, by applying mathematical models and analytics tools—including algorithms that can learn and improve over time—high-tech companies and their logistics partners can glean more insights to better manage risk and leverage opportunities to deliver customer value through flexible operations.

**Focusing on Risk Impact, not Cause**

My Ph.D. students and I recently developed a new approach to better manage supply chain disruptions. Using linear optimization, the model focuses on the impact—not the cause—of potential supply chain failures. This approach is more useful for planning risk management strategies for unforeseeable disasters, such as a tsunami or an earthquake.
• Supporting the Big Event

Few events introduce more supply chain complexity than the rollout of a highly anticipated consumer electronics product. The last thing a company wants is to disappoint anxious customers.

Historical supply chain data helps us plot strategies for launch day. The goal is to hit all sales channels simultaneously, in optimal volumes. Analysis of historical patterns, including localized variations in demand and real-time social media buzz, feed into the analytics that suggest where to stage product inventories and in what volumes.

Analytics can also help avoid “excursions,” which is when sellers begin selling a device before launch. With real-time supply chain visibility, we can search the network and trace these events.

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The computerized model helps supply chain professionals understand the financial and operational impact of failure at any node, estimate time to recovery and determine the best response. It provides a holistic view of existing and alternative sources of supply, transportation, inventory, warehousing, finished goods, work-in-progress and raw material, and production dependencies within the chain.

Given the explosion of sensors, I could imagine a future in which this model is combined with live data from factories, warehouses, transportation hubs, shipments on trucks and the like, to predict where nodes might be weak, require maintenance or face other risk. My team is now collaborating with a few companies to make this vision a reality.

• Smarter Reverse Logistics

Reverse logistics are benefiting from supply chain analytics as well, with new models that analyze data at the point of return and make an intelligent routing decision.

If a sensor-enabled device malfunctions, for example, the technology provider would know what is wrong based on data generated by the device. We make it easy for the customer to take the box to an authorized UPS pickup location or schedule a pickup.

Using business rules established jointly with the vendor, we’re able to determine where the box should go: a recycling center, a repair facility (possibly a UPS facility at the end of a runway) or a third-party refurbishing vendor.

By gathering intelligence from one end of the supply chain to the other, UPS can help its partners fine-tune the delivery of superior service across multiple channels. The result: satisfied customers, higher revenue, leaner inventory and lower costs.

Discover how data can reshape the future of logistics—and deliver big results.

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