

Volume 3

TRANSVOYANT

Digital Supply Chain Education Series



Dennis Groseclose
CEO, TransVoyant

Sensors as interchangeable tools, not a digital supply chain silver bullet

I was recently asked by a non-supply chain focused executive, “what’s so difficult about what you guys do? You just need to slap a sensor on every package and you can see where shipments are in real-time!”

I won’t sell the gentleman out who asked me that question, but he obviously has not walked a mile in the shoes of the supply chain professionals at his company. If he had, he would realize how off-base his comments were.

While sensors have their advantages, they are by no means a digital supply chain silver bullet. Here’s why.

1) Sensors are just a data collection device; they are not the value driver

As I pointed out in our last education series post, real-time visibility is not the primary value driver for digital supply chains. The ability to understand and

predict supply chain behavior (predicted times of arrival, predicted disruptions, predicted throughput, predicted variability) is where the value of digital supply chains lie. Business value resulting from behavior modeling and accurate predictions comes in the form of reduced inventory, lower logistics costs, increased revenue and improved customer service.

2) Sensors can be expensive

Interested in wiping out the margins on your high-volume, low-value goods coming out of Asia? Throw a GSM or GPS-enabled sensor in every box. While the cost of sensors is dropping rapidly, and will continue to drop for the foreseeable future, attaching a GSM or GPS-enabled sensor to every shipment is not the right answer, even for companies that ship high-value goods. It's simply too expensive.

Looking for a low-cost sensor option? We've had success with blue-tooth enabled sensors. They are a fraction of the cost of a GSM or GPS-enabled sensor, but these types of sensors require a network of satellite-enabled listening devices to pick up their signal and relay it back to a central IoT platform. Sensors telling other sensors where they are. Sounds cool, doesn't it? We think so, too. We even have a patent on it.

3) Sensors require a communications network

A satellite-enabled sensor can provide real-time visibility of a shipment anywhere in the world, right? Wrong...unfortunately. We've seen our share of GSM or GPS-enabled sensors go dark in certain parts of the world, just as your cell phone loses signal on occasion. We've also seen GPS-enabled sensors lose signal when packed in the steel hull of an ocean vessel, underneath a stack of twenty-foot steel containers.

4) Sensors require country-specific certifications

Here's some free advice that will save any would-be 'sensor everything' advocate a lot of heartache. The sensor space is still nascent. Each country has their own set of certifications that sensors must have in order to be admitted into that country. These certifications are not trivial. And while many of the sensor providers may claim to have certifications for all the countries you ship into and out of, don't take their word for it. We've learned this lesson the hard way. We now field test our sensor partners on the subject of certification on

an ongoing basis.

5) Sensors have a limited battery life

Interested in tracking the real-time movement of your shipment from foreign supplier to the customer door? Depending on how long your end-to-end cycle times are, it's unlikely that a single sensor, on a single charge, will ping for that long, even with a lithium battery. Satellite-enabled sensors require a lot of battery power.

Sure, there are ways to mitigate this issue. We remotely turn off sensors while they are on an ocean vessel, for example, because we can track the vessel via other means. Once the shipment reaches the port of arrival, we turn on the sensor for the remainder of the journey.

6) Sensors require reverse logistics

If your intention is to begin tracking shipments with sensors from the time they pull away from your supplier's dock, you need think about how to get the sensors on your pallets, boxes or equipment at origin. In most cases, the way to do that is to reach an agreement with your suppliers to activate and attach sensors at origin. That means training your suppliers, forecasting sensor quantities, shipping them to your suppliers' locations, and replenishing that supply on an ongoing basis.

If you're using satellite enabled sensors, you also need to establish a reverse logistics process to collect them from your customers, ship them to your refurbishing / recharging facility and then send them back to your suppliers to be available for another cycle of tracking.

Satellite enabled sensors are far too expensive to simply have your customers throw them away once they reach their destination. Low cost, disposable, blue-tooth enabled sensors eliminate that problem, but you need to deal with the communications network requirement described in point #3.

7) Your sensor provider may be here today and gone tomorrow

The sensor space is evolving rapidly. New sensor solutions hit the market every month, it seems. As quickly as sensor technologies are advancing, the sensor leader of today could be gone tomorrow. This is the good news / bad news for supply chain practitioners. The good news is, sensor costs will continue to fall, much the way remote storage devices (aka memory sticks) dropped in price as

technology advanced rapidly. The bad news is, your sensor provider of choice this month may be obsolete in three months.

If you tie your digital supply chain fortunes to one sensor provider, you'll be in for a painful migration to another provider, unless you have an extensible IoT platform capable of switching sensor providers in and out easily.

For all the reasons described above, we treat sensors as interchangeable tools. Just one source of real-time big data among many other sources. Our IoT platform (TransVoyant Continuous Decision Intelligence™ CDITM) ingests real-time feeds from sensors the same way it ingests real-time feeds from social media platforms, radar installations, process control devices or smartphones. We can swap sensor providers in and out quickly, without a disruption in service or the need to establish new processes.

Their shortcomings notwithstanding, sensors do play a valuable role in the digital supply chain.

Some of our customer use-cases call for sensors that can log temperatures at every step along a shipment's journey. This is helpful in the case of pharmaceuticals, food goods, or any other products that are sensitive to heat or cold. Sensors can generate alerts when temperatures begin to trend outside of acceptable tolerances, and provide an audit trail of how long the goods were exposed to extreme temperatures for the purposes of identifying spoilage.

We also have customer use-cases that call for sensors that detect impact and vibration. These types of sensors are helpful in identifying which goods require inspection when they reach their final destination, based on how they've been handled en-route. They also provide an audit trail of where the damage likely took place and under whose care they were at the time of impact.

Another attractive feature of sensors is that they don't require the cooperation of--or connection to--extended trading partners. Take, for example, truck shipments. The most common method for providing real-time tracking of goods on trucks is via direct connection to the trucking company, which we have established over time ourselves.

This is typically done by ingesting real-time pings from telematics devices that are already onboard the trucks. In order to collect these pings, however, the technology provider offering real-time shipment tracking must have pre-established connectivity to all the trucking companies that the shipper uses

If the shipper has a GSM or GPS-enabled sensor on their pallet or within their box, there's no need for such carrier integration or cooperation.

All that said, don't put too much emphasis on sensors along your digital supply chain journey. Sensors should be treated as extensible tools within your digital supply chain. You should be able to interchange sensors without disruptions to your supply chain processes and without the need to develop new integrations every time you switch. A flexible IoT platform enables that extensibility.

To Learn More Visit www.transvoyant.com