



## Data pipelines of the future

By Colin Laughlan

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Karl Marx is not often cited as a supply chain management visionary, but “from each according to their ability, to each according to their need” is a perfectly apt description of how the electronic capture and extraction of shipping data will undergo a global revolution in the not too distant future. Innovative data pipelines — developed largely by the European Union (EU) — will soon be complemented with new standards for data interoperability developed by the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT). The seamless international data pipeline of tomorrow holds the promise of greatly enhanced supply chain visibility to benefit end customers, and significantly improved security in the global transportation of containerized goods.

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### Background

Despite efforts by the World Customs Organization (WCO) over the past decade to balance trade facilitation with security measures based on the analysis of cross-border trade data (see *BCSN* September 2015: *SAFE Framework gives glimpse into Future Trade Management*), the system for ensuring data integrity is not working well.

According to Randy Rotchin, President and CEO of 3CE Technologies Inc., a Canadian company whose software measures the accuracy of Customs declarations, there are significant discrepancies

between the plain language (narrative) description of the shipped goods and the Harmonized System (H.S.) code, a multi-digit classification of the description used for Customs declarations. “We’ve done many studies for many countries. The error rates range from about 25 per cent to somewhere around 40 per cent,” Rotchin told *BCSN*. “Aside from manual and very laborious processes, there’s no real way to ensure that these codes that are being declared are very accurate,” said Rotchin.

3CE’s studies were part of the research that alerted David Hesketh, who at the time was Director of Research and Development with HM Revenue and Customs in the United Kingdom. Other experts pointed Hesketh to studies showing discrepancies as high as 60 per cent.

For Hesketh, it was an urgent call to action. For more than 10 years he has spearheaded research within industry and government to find a workable supply chain solution. (Hesketh even completed a Masters degree on the subject during his research and is now a lecturer at the Centre for Customs and Excise Studies in Australia.)

The problem, he explained, was that “it’s very hard for Customs to do anything about it unless they launched some big enforcement campaign, which may very well end up flying in the face of trade facilitation.

“Customs was inheriting the consequence of bad data which had its roots in the commercial supply chain. The focus had developed historically based on information provided to terminals because operators had only been interested in how many containers were arriving — with the main aim of getting the container out of the gate as quickly as possible.”

Hesketh further went on to say: “I believed what was more important was the commodity moved, and who packed the container — that is, where should we



*David Hesketh, former Director of Research and Development, HM Revenue and Customs, U.K.*

get that data — as opposed to carrying on the old traditional way of import declarations, manifests, and so on. Another major problem was that buyers didn’t really know what they were getting until it arrived.

“We need to get the data from the right source, at the right time, and we need to hold that person accountable. I wanted to move that point of capture as far upstream as possible, which ultimately meant the person who was loading the container.”

That meant source data would have to come from shippers or their freight forwarding agents, or even in some cases from the manufacturer of the goods. Recognizing that resistance would likely come from shippers who did not want to reveal their competitive sources, Hesketh advised them, “the only people who can access the data are those authorized to have it.” The idea, he said “was not to ask people to give us information that they weren’t really required to by law,

but we wanted it earlier and from better sources.”

After several years of uphill battles with traditional mindsets, Hesketh’s efforts have been rewarded and now form part of the massive CORE (Consistently Optimized Resilient Secure) supply chain project currently underway in the European Union. Launched in 2014 as the synthesis of several previous research projects, CORE is a consortium of some 70 companies within the EU and beyond. The overall project looks at many different aspects of logistics — for example, disaster recovery from earthquakes and tsunamis, or terrorist attacks. The data pipeline is another aspect of CORE to create resiliency by getting all the information at source and helping to speed up passage of information across borders.

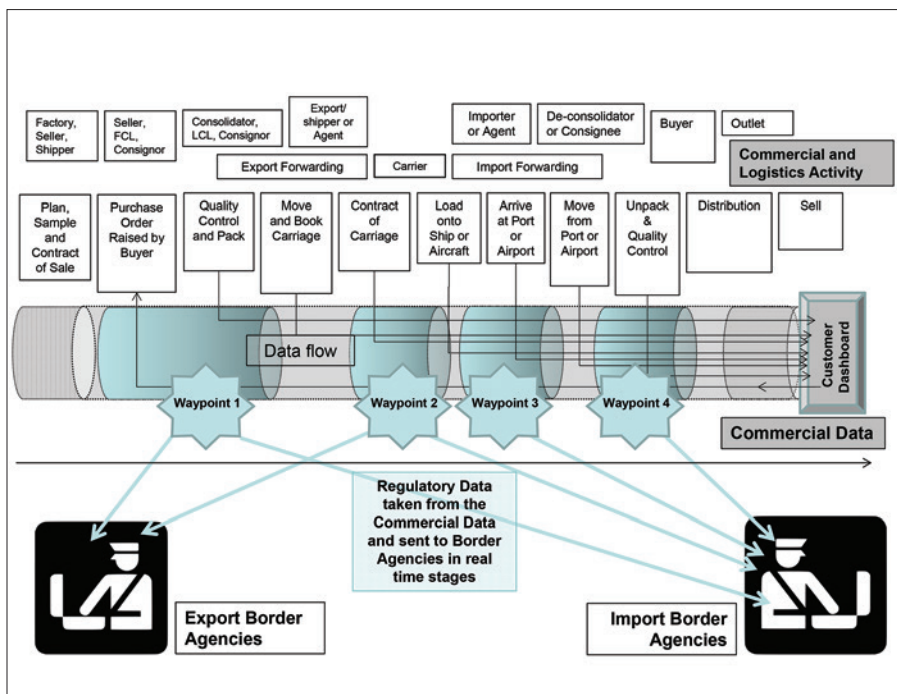
From CORE has emerged a model employing four points of data extraction (waypoints) throughout the end-to-end movement of goods in international supply chains. This data helps border agencies with pre-departure and pre-arrival risk assessment but can also be used for declaration purposes.

### Four waypoints

**Waypoint 1:** When the doors are closed on the container before it’s moved. About 50 per cent of regulatory data can be extracted now. Data is made available immediately to export and import agencies in the pipeline by the shipper. Data at this point also helps buyers minimize risk and provides assurance they are getting the goods they ordered.

**Waypoint 2:** 48 hours after sailing. Even if a container is on the docks 24 hours prior to sailing it doesn’t mean it will get loaded. At 48 hours after sailing (wheels up for air cargo) the majority of Master Bills of Lading are finalized. Additional information such as the ship’s name and its unique identifier, sailing confirmation, and that the container is on the ship is extracted by the export and import authorities.

**Waypoint 3:** 24 hours before port of arrival. This data includes the actual journey of the container, what countries it stopped in, and whether it’s arriving on the dates identified at the beginning. This is the point when a frontier declaration is made under simplified procedures. Data from waypoints 1, 2, and 3 can be brought together for a comprehensive frontier declaration to facilitate



Above diagram shows a seamless, integrated data pipeline concept.

immediate release, or, in the future, release prior to arrival for authorized operators using the pipeline approach.

**Waypoint 4:** When the container doors are opened, goods are taken out and validated against the purchase order. The receiver can see if it’s what was ordered. Any remaining information is extracted for the import supplementary declaration.

### Using the pipeline ...

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### Commercial pipeline in the U.K.

One successful commercial pipeline currently operating in the U.K. is the Ingot Portal developed in 2012 as a voluntary part of the CORE project by Warrant Group Ltd., the U.K.’s largest privately owned logistics services company. David Roff, Warrant’s Director of Information Technology, explained how several challenges were met, admitting the biggest was the change management needed to obtain information at Waypoint 1. “The shipper naturally says ‘no’ straight away, so it’s got to be customer-driven,” said Roff. “The customer then says, ‘as part of the contract, we need the following information supplied in

every stage. The information is required to do business with us. It enhances our supply chain and it reduces bottlenecks and costs,’ so that is how it’s incentivized, and overall the customer wins.”

However, Roff pointed out that it’s a win-win situation once data begins flowing. Using the pipeline, one of Warrant’s clients, Kirkby Tyres, showed a “30 per cent savings with supply chain efficiencies alone,” said Roff, “not to mention additional savings with greatly reduced demurrage and detention costs.”

Roff also explained how technology has allowed competitors to work collaboratively. Another of Warrant’s clients, B&M, a large variety retailer in the U.K., wanted the visibility afforded by the pipeline, but also wanted to keep several smaller-sized freight forwarders that separately managed the retailer’s goods movements. “When I went around to speak to the freight forwarders, I was very clear,” said Roff who told them, “This isn’t about who’s going to get a portion of the freight. I’m only here as an independent software provider for B&M and it’s in your interests that we all work together because we keep the wolves from the door” — an additional benefit for the smaller companies, Roff noted, “because in the traditional world, the kind of visibility desired by B&M would only be possible from a large global freight forwarder — but you would have to book all

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your freight with them. We keep global freight forwarders out of the equation,” he said. “It enables small and medium-sized companies to access a data pipeline that would probably be out of the scope for most of them.”

Warrant’s collaborative solution, he explained, was to use technology that “stuck a layer above all of that [competition],” so competitors could maintain confidential information but still have commercial opportunities. “Now everybody feeds their data into the Ingot Portal. Without the technology and thought process of how can we work together collaboratively, rather than against each other, it could not have worked,” he said.

## Future developments

The next phase of Hesketh’s supply chain data revolution appears to be headed to UN/CEFACT to integrate standards for global interoperability developed by technology experts from around the world. “The CORE data pipeline project is being used as a base for a project that Warrant Group’s David

Roff will lead to create the first data pipeline standard from UN/CEFACT,” Dr. Lance Thompson, Chair of UN/CEFACT, confirmed at the time of this writing.

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A globally seamless data pipeline would enable data exchanges by governments and businesses with whatever system they currently use. It would also enable data to be swapped between proprietary pipelines, thus enhancing competition as clients would not be locked into any single pipeline.

Thompson also speculated that three categories of data pipelines could eventually come out of UN/CEFACT’s work, which he described as i) a logistics

pipeline; ii) a commercial pipeline; and iii) a regulatory pipeline. “We don’t have anything official at this time, but it does seem clear that we’re going to be making at least one other type of pipeline — in order to separate logistics from supply chain information,” he said. “The regulatory pipeline,” he added, “would largely be based on data models which will take information from the other two pipelines and put it into a format that would be comprehensible to governments — mapping towards the WCO data model.” He expressed his optimism that the potential standard would be proposed at UN/CEFACT’s Forum in Geneva at the end of March 2017.

“When the projects are completed,” Thompson said, “UN/CEFACT will have a standard that any company afterward can use freely to establish a data pipeline.”

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