Preparing for tomorrow's supply chain

This is the second in a four-part series on the future of retail's supply chain. To read more on this topic visit Retail-week.com/SupplyChain

The Internet of Things: supply chain's big leap

The Internet of Things is dramatically reshaping how retail supply chains work. In the second part of our supply-chain series, **Lindsay Clark** explores the benefits it is unlocking for retailers

Tales of robot armies were once the stuff of science fiction, not the retail trade press. But in 2016, online grocery specialist Ocado publicised its automated warehouse system for online deliveries, hoping to sell the technology to other retailers around the world.

The move shone a spotlight on the Internet of Things (IoT), a concept that promises to connect a vast range of sensors, robots, displays and navigation systems to the internet to help manage businesses more intelligently.

Ocado built a system that controls 1,000 robots running on a grid of rails to help pick and distribute online deliveries.

But it also collects all the data from the system to understand and improve performance, according to Ocado Technology's head of data Dan Nelson.

"We go back and look at the data. Our newest robot warehouse in Andover allows us to do advanced analytics through visualisation or machine learning to optimise component parts on robots and communication systems and see how they interoperate," he says.

Ocado also stores and analyses GPS data from its delivery vehicles for later analysis to understand how it might have better optimised routes, almost down to the individual customer, Nelson adds.

Making data work

Despite its slight space-age connotation, the ability to connect intelligent devices to the internet has been around for some time.

Transport companies in the retail supply chain have been collecting data about location, but also driver behaviour and, in the case of food, product temperature.

But retailers can find it difficult to gather and analyse this data because different companies use it for different functions and can sometimes be reluctant to share it.

GateHouse, a Danish software company with a background in tracking global maritime freight, is trying to solve this problem.

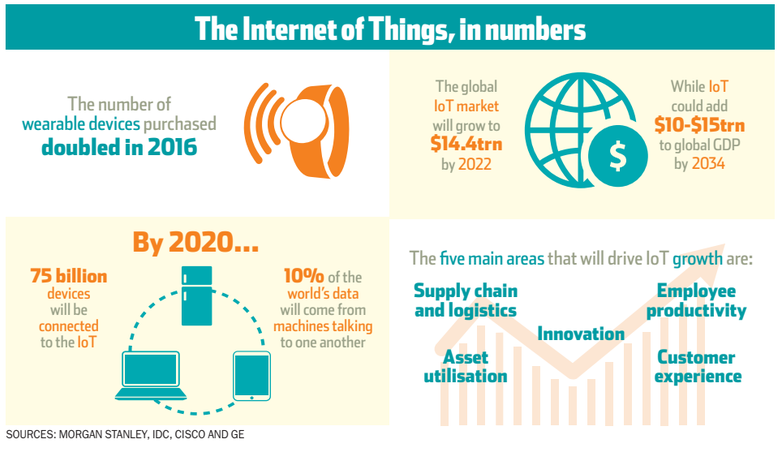
Søren Danielsen, strategic sales manager, says the transport sector is very fragmented, with thousands of companies running hundreds of different tracking systems.

GateHouse aggregates the data and combines it with information from planning systems within its retail customer base, including Dansk Supermarked Group, which owns Netto. The retailer runs around 400 stores, three distribution centres and uses up to seven transport companies.

Once each transport supplier's vehicle gets within a certain distance of one of its distribution centres, GateHouse publishes the data to the retailer and then tracks the vehicle on its journey from store to store, updating on any delays or more serious problems.

The information is displayed on a screen at the back of each store, rather like an airport departure board. It tells staff about delays and disruption, and they can then update the planning system, says Danielsen.

"The main benefit is store staff spend a lot less time on the phone finding out where deliveries are, and can concentrate instead on adjusting their own plans to accommodate updates from the distribution systems, which can mean trucks spend less time waiting at the back of stores," he says.



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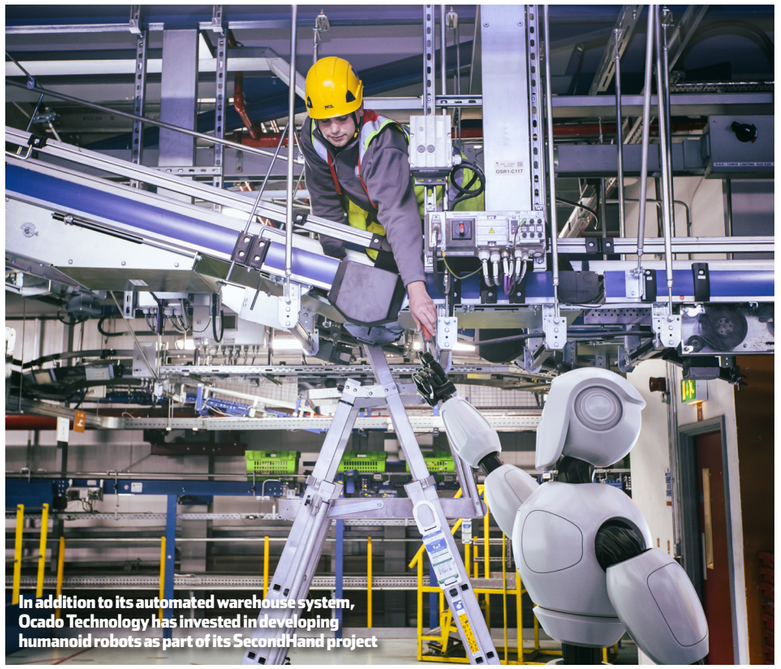

In addition to its automated warehouse system, Ocado Technology has invested in developing humanoid robots as part of its SecondHand project

The data is also collected for later analysis to improve distribution and store performance.

The difficulty in establishing the GateHouse system has not been in the technology but getting all parties in the supply chain to share data in a way that does not disadvantage them.

"Supermarkets were asking their transport companies for all their GPS data, but they were reluctant to provide it because this could also give away information about how they work with other customers and their internal costs.

"We make it clear we are neutral and retailers only see the data relevant to them," says Danielsen.

A realistic picture

But the IoT goes well beyond determining the position of trucks and temperature of goods in the supply chain. It allows a more realistic picture, at a pallet or item level, to be collected and analysed.

Although the ability to locate goods through radio-frequency identification (RFID) has been around for more than 15 years, the technology has become better and cheaper, says Emile Naus, technical director with supply-chain consultancy LCP.

"The main thing we're seeing with RFID is an improvement in stock accuracy: understanding where stock is, mainly in-store. The tags are now much easier to read and have become much cheaper," says Naus, who was formerly head of logistics strategy at Marks & Spencer.

For example, clothing firm Levi Strauss & Co built a system with Intel that offers near real-time inventory visibility of every item in its flagship store in San Francisco. It identifies all items with an RFID tag and uses readers to disseminate item-level data to its analytics systems.

The store team gets visibility about on-shelf availability and what is running low, making inventory replenishment more accurate.

In-store IoT can offer another advantage aside from stock management. Sensors in-store – dubbed beacons – can locate each individual customer, via their mobile phone, providing they grant permission. In-store cameras can also be hooked up to back-end artificial intelligence to track footfall in real time.

Retailers can store data from both sources to spot long-term trends using analytics and artificial intelligence, says Mike Bell, executive vice-president for devices and IoT at software company Canonical.

"The purpose is end-to-end integration of data, monitoring changes from the back-end systems to customer management systems. The analytics are critical to be able to react in real time and also spot bigger trends in the long term," he says.

"The vision is to create a system that can predict and respond to changes in customer behaviour and rapidly push information through the distribution system and supplier networks to ensure the right product is in the right location at the right time," he adds.

While this may be some way off, the technology is already available to start to pilot IoT to benefit supply-chain efficiency and response in retail. Those who have not started to work with it may already be behind.

Osborne Clarke

Will Robertson, partner, Osborne Clarke UK

"IoT is completely transforming the market, and businesses need to start harnessing the power of data if they want to hold a competitive advantage. Retail is at the start of the curve heading towards business-changing data intelligence. Now is the time to carefully plan your data strategy to ensure it has legal longevity as the law tries to keep pace.

"In May 2018, new European-wide data protection laws arrive (the General Data Protection Regulation). These laws will transform the landscape (and, yes, as you might have guessed, add extra burden) for any collection, storage and use of personal data. Plan now or risk difficult conversations in the near future about non-compliant datasets.

"We're seeing more challenges around who 'owns' business data within a supply chain, and also who has rights to use that data. It's often taken for granted that data flowing through your systems can be used for business intelligence or development purposes, but that may not always be the case. Contracts often explicitly prevent exploitation, or otherwise the confidentiality provisions can bite.

"Data security is higher than ever on the legal radar. Any form of business-sensitive or personal data needs a thick wrapper of security around it. Yes, there can be serious legal sanctions for security breaches, but often brand damage hits harder."

"[Data] allows us to do advanced analytics through visualisation or machine learning to optimise component parts on robots"
Dan Nelson, Ocado Technology