

SUPPLY CHAIN STRATEGIES

03 TRADE WAR THREAT TO SUPPLY CHAINS

04 DRONES DELIVERING TO DOORSTEPS?

12 ROBOTS COULD BE A TAXING IDEA



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SUPPLY CHAIN STRATEGIES

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TARIFFS

Trade wars pose threat to supply chains

Cyberattacks, IT outages, floods, earthquakes – to the list of threats facing companies’ supply chains, we can now add protectionism

BRIAN GROOM

Populist politics is stoking trade grievances. There is nervousness that US-China tensions may spill over into a trade war and, while some businesses are prepared, many are not. Supply chains are now so lean and interconnected, with production split into dozens or hundreds of stages, that the impact of a US-China trade war would be felt around the world.

“With risk management in the supply chain you have to be proactive. This isn’t something anymore in which you can sit around and think ‘when it happens we will sort it out’,” says Richard Wilding, professor of supply chain strategy at Cranfield School of Management.

There is hope yet of avoiding a full-blown conflict. More than a year into his presidency, Donald Trump has moved cautiously, in contrast to his campaign threat to impose an across-the-board 45 per cent tariff on imports from China. He has apparently heeded warnings that tariffs can hurt consumers and domestic industries, even if they help specific sectors.

Skirmishes are under way. In January, President Trump announced emergency “safeguard” tariffs against imports of solar panels and washing machines, citing job losses among American producers. The United States has made clear its plans to act against China on intellectual property theft, and is also considering tariffs on steel and aluminium.

China warned it would “resolutely defend its legitimate interests” and announced an anti-dumping investigation into US exports of sorghum, an animal feed, seen by analysts as a sign that Beijing wants to contain any disputes to narrow sectors.

The US trade deficit with China climbed to a record level in 2017, increasing pressure for tougher action. The gap between Chinese goods imported to the US and American goods exported to China increased from \$347 billion to \$375 billion, according to the US Commerce Department.

Some trade experts fear that more aggressive US measures will lead to a cycle of retaliation. “They raise the already high risk of new US tariffs on Chinese imports, almost certainly to be quickly followed by a carefully targeted Chinese response,” says economist Mary



Lovely of the Peterson Institute for International Economics.

The steps taken so far are neither unusual nor solely aimed at China. Duties of up to 50 per cent on imported washing machines for the next three years will hurt mainly South Korean exporters. Tariffs of up to 30 per cent on solar cells for four years are set below the maximum permitted.

The previous two American presidents took similar measures. Barack Obama put safeguard tariffs on tyres, while George W. Bush did the same with imports of steel. Studies suggest these caused the loss of more US jobs than they saved, but they did not cause a trade war.

Theoretically, US brands such as Boeing, Apple and Intel, along with industries such as soya beans, could be vulnerable to reprisals,

though China is likely to be wary of damaging its own economic interests. When President Obama put his 35 per cent tariff on Chinese tyres in 2009, China imposed penalties on US shipments of chickens and car parts.

If a wider war breaks out, other countries will inevitably be sucked in. Steel tariffs would hit allies such as Germany, Japan and South Korea. European Union officials have threatened to target US bourbon and dairy exports in retaliation.

How prepared are businesses? “Companies that have been impacted will take this seriously, but most organisations are quite dormant,” says Professor Wilding.

Companies must know where their suppliers and their suppliers’ suppliers are, he says, so they can anticipate disruption and arrange back-up supplies. They need to be

agile to design products in a way that avoids dependence on sole suppliers and to collaborate with partners such as logistics companies.

He adds: “Overlaying all this, you need continuous monitoring and intelligence. If you hear that a trade war has started between two countries, you can see which suppliers could be impacted.”

A survey by the Business Continuity Institute found that 69 per cent of companies do not have full visibility over their supply chains. “Some companies are investing in supply chain resilience, but the majority have plenty of room for improvement,” says Nick Wildgoose, global supply chain product leader at Zurich Insurance Group.

He urges companies to focus on their most profitable products. “If, say, 80 per cent are coming out of China, where is the back-up?” If a key product or component relies on a single supplier or supply route, he suggests the “heresy” of building up inventory. “It may cost \$10,000, but failure could cost \$10 million,” says Mr Wildgoose.

Longer term, he suggests companies could redesign products to remove rare materials that are available only in China or, perhaps, persuade a mining company in Australia to find an alternative source.

A survey by Deloitte found that 53 per cent of companies had a high or critical dependency on their suppliers, but almost nine out of ten were not fully prepared to deal with uncertainties.

Lance Younger, head of Deloitte’s UK sourcing and procurement practice, says that while companies often had a good understanding of tier-one suppliers, this was often lacking lower down the chain.

Forward-thinking companies are using technology to scour news sources and datasets to identify emerging problems, he says. Others are developing centres of excellence to improve supply chain expertise or collaborating with other companies to share intelligence about potential supplier failures.

Achieving greater transparency can create opportunities as well as minimising risks. Mr Younger says: “Many organisations start with a programme that is orientated around risk reduction, but then the rigour that provides lays the foundation for better commercial approaches.” ♦

Weak links in the chain



Drones delivering to doorsteps?

Can developing drone technology glide over pitfalls and regulatory hurdles to drop off parcels on your doorstep?

NICK EASEN

The drone on drones has reached fever pitch, yet unmanned aerial vehicles or UAVs are coming of age. Once the bastion of joystick-wielding hobbyists, jail-bound drug smugglers or missile-wielding military wonks, the tech is now taken seriously by industry.

And it could soon make a difference to supply chains. The fact that Intel created a drone show for the Winter Olympics in PyeongChang as a thing of beauty, while this year's Consumer Electronic Show showcased ballet-styled choreography, drone racing and even one playing table tennis highlights how these flying machines are capturing people's imagination.

"This is an interesting insight into the consumer journey towards acceptance of drones through humanisation, using technology that may have been previously perceived as slightly sinister," explains



01

01 Intel's drone show for the Winter Olympics in PyeongChang

02 The future delivery ecosystem could be made up of autonomous aerial drones and delivery robots such as the Starship delivery vehicle

Michelle Du Prat, strategy director at Household.

Amazon's drone delivery plans are well documented as are Google's Alphabet with its Project Wing, both looking to create a sky-bound logistics network. There's an increasing realisation that there's

money to be made from flighty wares. PwC estimates that drone services could be worth more than \$127 billion globally, with \$13 billion to be made in transport.

"However, this market requires a lot of investment and supporting infrastructure. It's important that the technology advances as well. Above all though there needs to be a key driver and that's consumer need," says Elaine Whyte, head of PwC's UK drones team.

Nesta's Flying High Challenge is helping. The UK's innovation foundation is looking at drone deployment in cities. Logistics and deliveries are part of the focus. London, Preston, Bradford, Southampton and the West Midlands will soon explore how drones can operate in complex urban environments.

"In just a few years, the technology has grown from the world of DIY to systems for professionals that can tell where they are and smartly sense and avoid obstructions," says Martin Brandenburg, managing director for Europe, the Middle East and Africa at DJI, a Chinese firm which is one of the biggest in the industry. "However, there are still challenges in their implementation and commercialisation."

And that's where the stumbling blocks lie. DJI doesn't see drone delivery, at least not door-to-door, becoming mainstream for the next

three years. Firstly, there are physical constraints in payloads, flight times, speeds and drone sizes. Secondly, UAVs need better sensors and on-board intelligence if they're to perform autonomous flight beyond the line of sight.

"Another issue concerns public safety, privacy and perception. People need to be reassured that what flies above their heads is certified, regulated and quality controlled by national authorities," says Professor Dario Floreano, director of the Laboratory of Intelligent Systems at the Swiss Federal Institute of Technology.

"I'm optimistic that perception will change. Drones are already delivering critical health supplies to remote areas that cannot easily be reached by other means."

This is where the low-hanging fruit of drone delivery is, rather than in air-dropping a pair of trainers into a middle-class Cambridge suburb. For instance, Zipline is already flying blood and vaccines

by drone in Rwanda and Tanzania, while Silicon Valley startup Matternet has been testing a drone network ferrying medical samples between Swiss hospitals.

"It's difficult to envisage how the cost of drone delivery will ever make it anything other than high end. However, where this is less of an issue or accessibility is paramount, such as in delivery of emergency medicines, then small drone delivery could come into its own," says Dr Sue Wolfe, strategy director at the Association of Remotely Piloted Aircraft Systems UK.

She believes that for routine large-scale deliveries the future lies in bringing together transport systems across a multitude of platforms – air, sea and road. "This will involve an integrated approach to logistics, with the broader consideration of autonomous cargo. This could begin to revolutionise the logistics sector in the medium to longer term," says Dr Wolfe.

The Department for Transport's forthcoming Drone Bill will deal with some of the issues, as is the European Aviation Safety Agency's recently published *Opinion 01/2018* document. Both will become legal requirements in a relatively short timeframe as the regulatory framework for deployment evolves.

"It is too early to say how drones will play out. The market is too difficult to predict. You cannot separate out the issues surrounding regulation, safety, efficiency and the technology," explains PwC's Ms Whyte. "The role of the UK government will be crucial. They're also taking a proactive approach."

The last mile, involving the final stretch in getting goods from a logistics hub to the doorstep, is the business battleground. Drones can look enviously at ground-based autonomous delivery robots, which are now much more advanced.

"To date they have had more success commercially. They operate at safe and slow speeds on the pavement and have many benefits over aerial drones including cost, efficiency, safety and regulation," says Henry Harris-Burland, vice president for marketing at Starship Technologies, which is developing the technology.

"There is inefficiency when it comes to last-mile delivery. It's a bottleneck in logistics right now and many businesses are looking to use technology to solve the problem. In the future, we imagine an autonomous ecosystem made up of aerial drones and delivery robots."

With e-commerce growing by 10 per cent a year, the problem is getting worse, along with congestion and pollution from delivery vans. US researchers have found that emissions are less for drone deliveries in some instances. Droning on, this could be the next testing ground. ♦



02

Drones are already delivering critical health supplies to remote areas that cannot easily be reached by other means



Preparing for lift-off at Amazon Prime

Secretive business behemoth Amazon is full throttle for a delivery battle in the sky

NICK EASEN

Trying to get anything out of Amazon other than a video of Jeremy Clarkson smarmily waxing lyrical about drone delivery and a 2016 statement of intent concerning aerial parcel drops within 30 minutes to UK customers is like trying to get blood out of a stone. Such is the secrecy of this global behemoth and its plans for rapid parcel deliveries by air.

When approached, Av Raichura from Amazon Prime Air, says: “We don’t have anything to offer other than what’s on our webpage.” But there are things we do know. Jeff Bezos’s company now has a drone development centre in Cambridge where it’s conducting private trials. This complements what is going on in the United States, Austria, France and Israel. Amazon is also collaborating with the UK’s Civil Aviation Authority.

The company is testing drone sensors and their performance to make sure they can identify and avoid obstacles, and conducting flights where one person operates multiple automated drones.

Currently, Amazon is also testing different designs and delivery mechanisms. According to DJI, a leading drone manufacturer, there are limitations on the size of the payload, as well as flight times.

“Amazon’s beta testing is limited to packages weighing less than five pounds. Any packages bigger or heavier will mean a larger drone, which also requires

larger battery life,” explains DJI’s Martin Brandenburg.

Another research area is “beyond line of sight operations” in rural and suburban areas to investigate what happens to things the drone can’t see outside its camera range going mainstream will require widespread adoption of transportation rules that authorise flight beyond line of visual sight.

“For instance, the Federal Aviation Authority (FAA) in the US has rules on keeping drones in line of sight while flying. This presents challenges for door-to-door delivery,” says Mr Brandenburg.

“The current FAA requirements mean Amazon’s drones should fly no higher than 122 metres and no faster than 100mph. With such restrictions, delivering within a city is neither realistic nor feasible at the moment.”

Their key focus is on the last mile as up to 50 per cent of delivery cost is weighted in this final stretch. Investments in Prime Air are also strategic, complementing Amazon’s grand plans in package delivery.

For instance, the trillion-dollar company is about to muscle in on this sector, according to news reports. Called Shipping with Amazon, it will compete with UPS or FedEx in the US or Royal Mail and Yodel in the UK. A sector already plagued by low margins and cut-throat service.

This new offering will pick up packages from businesses selling goods on Amazon and ship them to consumers, expanding on a pilot launched two years ago in Los Angeles. Watch this space. ♦

Commercial feature



Modern slavery: more than a statistic

Modern slavery is harming every industry, in every community, in every corner of the globe

The International Labour Organization estimates there are more than 40 million victims of modern slavery worldwide, one in four of them children, and nearly 25 million in forced labour, suggesting the sheer scale of the problem. The issue does not discriminate gender, race or age. It can affect anyone. The immediacy of the challenge has been brought home to UK businesses by the pioneering law-making of the UK’s Modern Slavery Act 2015.

Legislation requires UK businesses with a turnover of £36 million-plus to publish an annual statement on how they are combating modern-day slavery

No supply chain is immune, says chief executive of Sedex, Jonathan Ivelaw-Chapman. “It is a global problem, which touches every country, developed and developing,” he says. “We can all point to the usual suspects, such as Myanmar, but we have modern slavery here in the UK, hence the legislation – it’s in our own backyard.”

Home Office figures from 2013 estimated there were between 10,000 and 13,000 victims of slavery and trafficking in the UK. By 2016, National Crime Agency data found the number of people referred for help had doubled in just three years.

Headline statistics alone, though, cannot convey the human story or fully explain changes over time and boundaries. The effects of distressed

migration on labour patterns in Europe, as a result of conflict in the Levant, are an example of an evolving regional situation, with cross-border implications. Business needs actionable intelligence.

Sedex – Supplier Ethical Data Exchange – operates one of the world’s largest data-exchange platforms. From inception 14 years ago, Sedex has grown to include over 48,000 supplier members and more than 800 customer members. Covering 150 countries, members share supply chain data on activity across the board, good to bad. This enables all involved to make better-informed business decisions, driving continuous improvement in ethical, sustainable and social impacts.

Supply chain visibility is no simple matter. The multi-tiered complexity of modern business makes it difficult for organisations even to be aware of risks they may be facing, never mind map and manage them. It gets harder and harder to see through layer upon layer of the supply chain, all the way to the people that matter, maybe working hunched over crops, thousands of feet up in remote rural areas, miles from any high street client.

In response, Sedex tracks activity from tier zero, the customer end, right through to tier nine, the beginning of the supply chain. The platform uses geolocation to help flag political indicators and environmental issues, as well as aggregated data to give sector-specific intelligence for enterprises such as the garment or electronics industries. This facilitates real transparency and traceability.

Combining both historical perspectives and up-to-the-minute particulars, Sedex offers a range of tools to assist in raising awareness and targeting solutions around modern slavery. SMETA – Sedex Members Ethical Trade Audit – is one of the most widely used ethical auditing tools in the world. It adopts a four-pillar approach to labour standards, health

and safety, the environment and business ethics, to drill down into the detail.

In alignment with the Modern Slavery Act, Sedex Forced Labour Indicator Reports are also designed to target supply chain issues. Key for businesses presenting statements on slavery and human trafficking, they help enhance ethical standing as well as ensure regulatory compliance.

Sedex member Lidl has been using the Sedex platform since 2016. A Lidl spokesperson says: “The platform provides indicators of human rights risks to workers across our supply chain and has shown us, for example, that 80 per cent of our UK supply base use a degree of agency labour and 27 per cent rely on temporary labour. This type of information helps us to prioritise areas of modern-slavery risk and enables us to develop targeted actions.”

Sedex can help you identify where there might be risks in your supply chain

Given the urgency of the problem and availability of the resource, there is no excuse for complacency, concludes Mr Ivelaw-Chapman. “Bombarded by issues and pressured for time, it can be easy to lose sight of what matters in business. In the case of modern slavery, it is the people that matter,” he says.

“You need a clear supply chain strategy, a response. Modern slavery is not going away. Don’t get distracted.”

For more information please visit www.sedexglobal.com



Q&A Digitisation of logistics processes brings visibility to the supply chain

As companies turn to digital technology to tackle logistical inefficiencies in transportation, **David Williamson**, global account director at cloud-based logistics platform Transporeon, discusses what this means for the retail and fast-moving consumer goods supply chain

What social and technological trends are driving new challenges in logistics?

Some of the main technological trends are the move to cloud-based platforms, the drive for real-time communication, and better use and understanding of what big data can do for business. The need for communication and information is now anytime anywhere, which is driving digitisation and seeing the rise of the e-logistics market. This drives challenges such as driver and capacity shortage across all of the industries. Increasing road congestion and regulations do not help either. Horizontal and vertical collaboration is insufficient and transparency is lacking. If you look at fast-moving consumer goods, or FMCG, and retail particularly, the manufacturers, shippers and retailers all have distribution centres in similar places. They are all sending vehicles to and from these locations, which means there are a lot of empty miles. Being able to fill those empty vehicles is quite difficult because of insufficient collaboration, as well as a lack of visibility and digitisation in the supply chains that each manufacturer, supplier or retailer operate.

What are the key inefficiencies in transportation today?

Empty running is a huge issue. Vehicles leaving the manufacturers, consolidators or suppliers are normally full, but once they've delivered their load, they have a period of empty running. Between 15 and 20 per cent of all trucks on the road are empty, and that's a massive problem. Meanwhile, up to 90 minutes are wasted when a truck gets wherever it's going to be offloaded or unloaded. These inefficiencies are the result of poor transparency, a lack of connectivity and because of the manual processes involved. Phone calls, faxes, emails and manual processes are all still commonly used throughout supply chains, so that's your visibility gone. It makes it increasingly difficult to tackle empty trucks, and reduce idle and waiting times when you don't have software, ideally cloud based, to be able to give you visibility and the ability to do something about it. All companies want an end-to-end visible supply chain and this is where digitisation comes in because that's the only way you can truly achieve it. Only if you have a true end-to-end vision can you fully control and see where inefficiencies are, and then drive them out.

How is Transporeon helping companies to tackle these inefficiencies?

Connectivity is the heart of what we do – we give manufacturers, shippers and retailers the ability to connect with their carriers. When you connect with your carriers and multiple suppliers through software as a service (SaaS), you can link thousands of independent companies within your supply chain, irrespective of which system they operate. Then you can connect your warehouses into that particular chain, providing the opportunity to manage both your inbound and outbound flow, removing peaks and troughs. If you're able to connect all the different partners you have in your supply chain and see

them in one place, then you have total visibility. But that isn't enough. You then need platforms that help you to act on that visibility to reduce empty miles, for example, or reduce CO₂.

Connectivity is the heart of what we do – we give manufacturers, shippers and retailers the ability to connect with their carriers

As companies continue to digitise their logistics processes, how will supply chain strategies evolve?

Collaboration and seamless connectivity between different suppliers, retailers and manufacturers holds the key to reducing empty miles. Accessing big data offers real-time optimisation, and will provide business-relevant analytics and paperless connectivity with carriers. Dynamic rerouting and capacity planning will also help supply chain strategies to evolve. Having visibility and being able to co-operate will overcome those huge barriers. That's where we will play an even bigger part in the future because connectivity and visibility are absolutely crucial to being able to achieve closer co-operation and better efficiency.

For more information please visit www.transporeon-group.com



David Williamson
Global account director
Transporeon Group

Strengthening links in the supply chain

A transparent and tamper-proof distributed ledger is poised to transform outdated methods of tracking and authenticating goods in the supply chain

HEIDI VELLA

An inherent ability to allow more secure, transparent and easy tracking of transactions and objects has piqued interest in blockchain among global supply chains.

Certainly, many major players have this year declared they are ready to bet big on this form of distributed ledger.

Global shipper Maersk says it will launch an industry-wide trading platform powered by IBM blockchain. The company's bosses hope it could "form a utility that brings standards across the entire ecosystem".

Essentially, Maersk wants to digitise the entire supply chain, tracking online and in real time tens of millions of shipping containers globally from end to end, a process that normally involves up to 30 people and more than 200 different communications.

Beyond tracking containers, the cryptography-secured online ledger that blockchain provides, paired

with electronic tracking technology, could also prevent product counterfeiting and fraud, putting an end to scams like the 2013 horsemeat scandal or more recent reports that real cat fur is being sold on the high street as faux fur.

"Blockchain has the potential to create a very deep level of traceability and origin by storing information in a place where you can guarantee it won't be tampered with," says Renato Grottola, DNV GL's digital transformation director.

Any product or raw material can be given a universal unique identifier or code from the moment it is made. This would be logged on to the blockchain and every time the item gets moved or modified it is permanently tracked on the ledger.

"This creates several obstacles to cheating the origin of a product and the transformation process it was exposed to," says Mr Grottola.

DNV GL, a risk management and global assurance company, last month announced a partnership with blockchain firm VeChain that aims to improve the efficiencies

Factfile

27K+

new projects related to blockchain were created on code repository GitHub last year, according to data collected by Deloitte. As blockchain development has largely been orchestrated in an open-source environment,

studying projects specifically on GitHub, the world's largest known software collaboration platform, enabled the consultancy to track who is leading the way in blockchain applicability



Simon Dawson/Bloomberg via Getty Images

of its customers' supply chains, making them more "peer to peer and trustworthy".

Precious stones retailer De Beers has also said it wants to use a blockchain ledger to track diamonds each time they change hands, starting from the moment they are mined. The company hopes this will give cast-iron guarantees to consumers that its diamonds are ethically mined, while also preventing synthetic lab-made diamonds being traded as natural ones.

London-based blockchain firm Everledger is already tracking ownership of thousands of diamonds to assist traders and insurers in monitoring the provenance of jewels and to spot stolen or conflict-zone diamonds. More than 858,890 diamonds have been entered on to the firm's ledger so far with 40 unique datapoints being collected to create a digital thumbprint for each stone.

Knowing in provable detail the journey and provenance of a product offers a unique selling point for brands.

"This information can be shared with the consumer and verified by a third party for added value from a marketing perspective," says Mr Grottola.

Ireland Craft Beers and blockchain firm arc-net, for example, allow consumers to trace its beers' ingredients from source via a QR code. The company has recently partnered with PwC to develop its cryptographic marker and tracking technology further.

This deep-level tracking can also increase safety in the supply chain. It is particularly useful for

proving the authenticity of critical components in aeroplane engines, eliminating inadequate, scrapped or counterfeit parts entering the manufacturing process, or for proving the authenticity of prescription drugs.

Nevertheless, as good as an immutable online ledger is, it becomes less effective if the information entered on to it is inaccurate or only tells part of a products' story. For example, the system can prove which mine a diamond came from, but not whether child labour was used in the process or not.

This is what Robert Learney, chief

Knowing in provable detail the journey and provenance of a product offers a unique selling point for brands

technology officer specialising in blockchain and distributed ledger technology at Digital Catapult, which works with Innovate UK to boost digital innovation in UK companies, calls the "bottle tracking problem".

"If I had this amazing whisky and stuck a label on the bottle and tracked it using blockchain, I would know exactly where the label on the

Precious stones retailer De Beers wants to use a blockchain ledger to track diamonds each time they change hands from the moment they are mined

bottle is, but very little about the content itself," he explains.

Translating blockchain, which started as a ledger for financial digital transactions, into the real world is more challenging when the content of the tracked object holds the main value.

But it's not impossible. Companies can invest in sensors or testing technology, for example, that batch tests products as it tracks through the supply chain, adds Mr Learney.

Blockchain offers a plethora of possibilities for securing, streamlining and essentially cleaning up complex logistics systems, but actually, because of this, getting widespread adoption will be a major hurdle.

"There are people who make money from middlemen, from controlling information flows and corruption, and this is where we may find extreme pushback, particularly in large parts of the world where corruption is endemic," says Mr Learney.

Adoption of new technology in industries, such as the supply chain sector which has seen little innovation over the last 50 to 70 years, is often an uphill struggle, especially when the technology itself is so nascent.

But with major firms including Maersk backing the technology, and consumers demanding more assurances and authenticity from products, this is likely to be just the beginning of blockchain in the supply chain. ♦

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DELIVERED BY DRONE

Home deliveries by drone are no longer science fiction, with logistics and retail companies such as Amazon and UPS investing, and exploring ways to ramp up and roll out the technology. While the consumer benefit is obvious – faster deliveries at a fraction of the cost – the opportunities for business are also huge. Regulatory hurdles still have to be overcome, but the technology is ready and could be coming to a doorstep near you soon

\$0.05

estimated potential cost per mile for delivery by drone

Deutsche Bank 2016

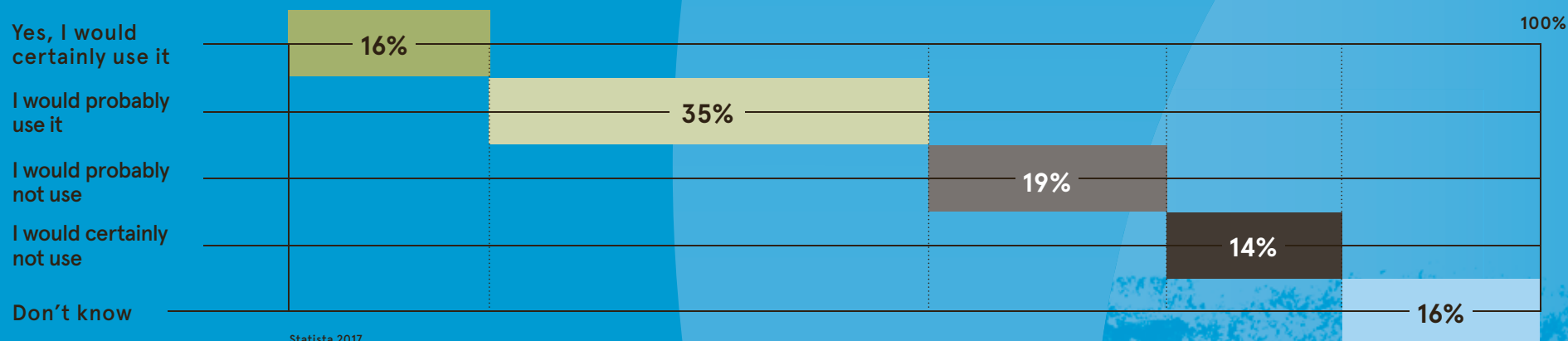
86%

of online shoppers said expensive shipping costs were the primary reason they abandon checkout carts

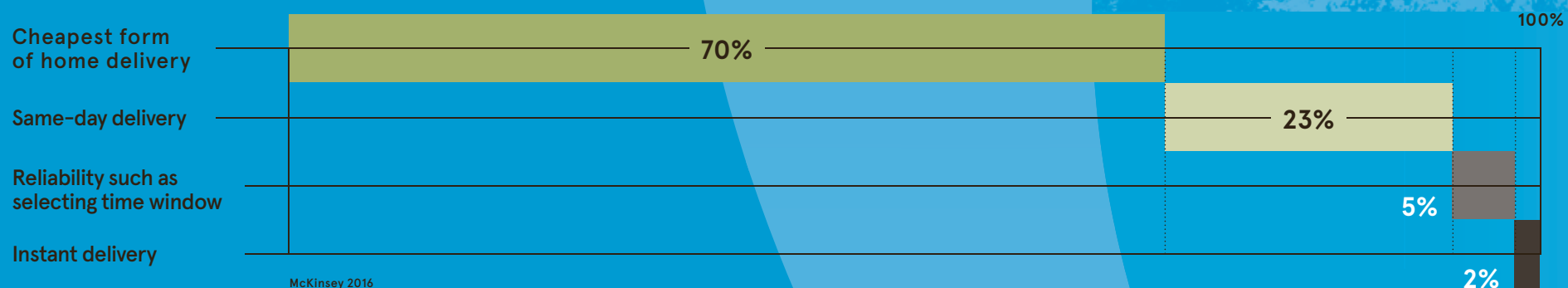
McKinsey 2017

PUBLIC SUPPORT STILL MIXED FOR LOGISTICS DRONES

Would you use the option to have your order delivered by drone?

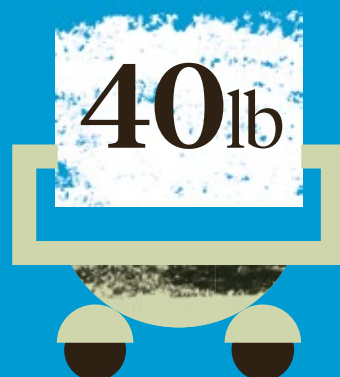


WHAT CONSUMERS WANT FROM DELIVERY OPTIONS



STARSHIP GROUND ROBOT

The Starship Technologies Delivery Robot is a self-driving robotic delivery vehicle that can carry items within a two-mile radius at pedestrian speed



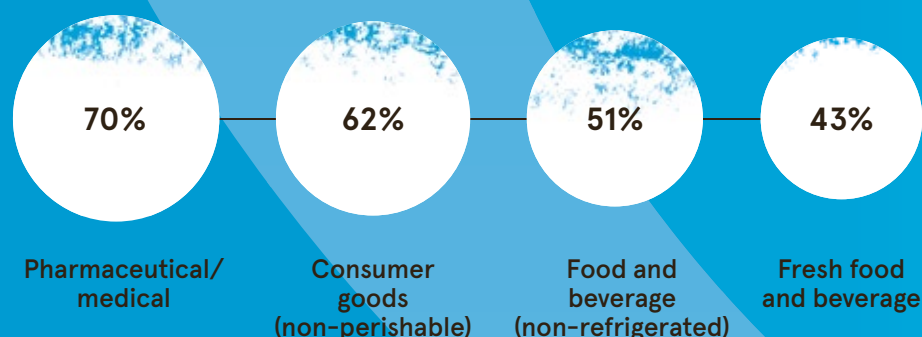
SPEED
TARGET COST PER DELIVERY

4mph
\$2.80*

*Starship Technologies have given a target range of between \$1.40 and \$4.20
Ivey Business Review/Bloomberg/Statista 2017

MARKETS TO BENEFIT FROM DRONE DELIVERIES

Percentage of *Packaging Digest* readers who think the following markets would benefit...



Packaging Digest 2016

AMAZON DRONE

Drones are much faster and cheaper than ground delivery robots, but can only carry lighter parcels

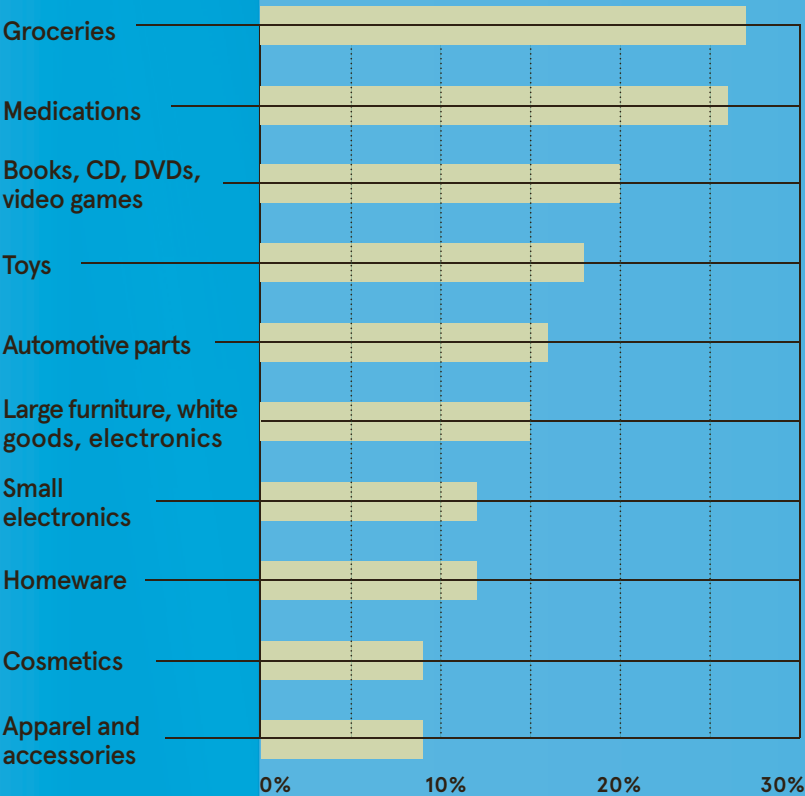
SPEED 100mph

TARGET COST PER DELIVERY \$1



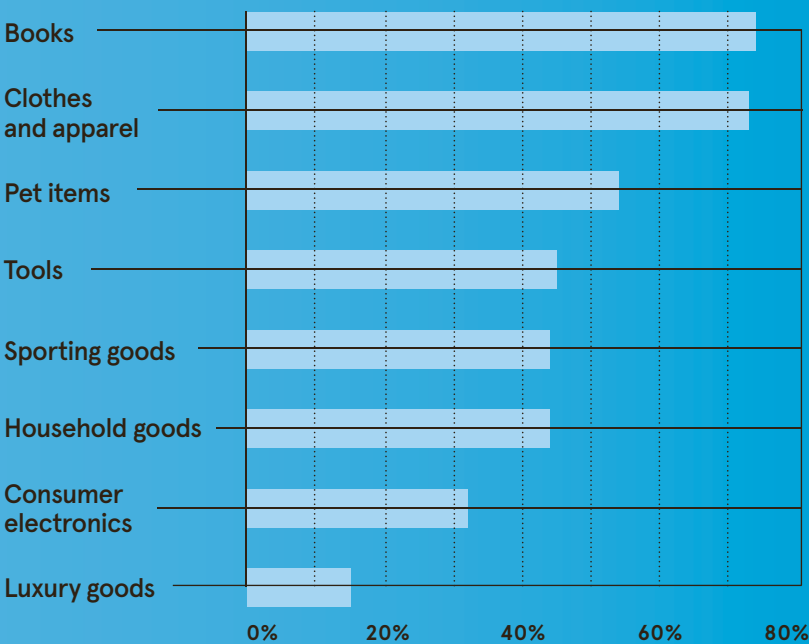
IMPACT OF LONG DELIVERY TIMES

Percentage of consumers who did not purchase an item online due to long delivery times



INTEREST IN DRONE DELIVERIES, BY PRODUCT

Percentage of consumers who would be open to trusting drone delivery for the following...



<30mins delivery



TIME IS MONEY

Amazon Prime Air is a conceptual future delivery system that the retail giant promises will get packages to customers in 30 minutes or less, as long as the destination is within ten miles of an Amazon fulfilment centre. The company is experimenting with drone deliveries of packages that weigh up to five pounds, which make up nearly 90 per cent of the items it sells. Prime Air is being tested in multiple international locations, with development centres in the UK, United States and Israel. Its first order, for a Amazon Fire Stick and bag of popcorn delivered in the Cambridgeshire countryside, arrived in just 13 minutes

\$50m saving



LAST-MILE DELIVERIES

Rural deliveries are often the most expensive routes for logistics and transport firms due to the time required and vehicle expense, and that “last mile”, between a delivery van and a recipient’s door, is often the least efficient part of the shipping process. UPS has even estimated it could save up to \$50 million each year by cutting just one mile from the daily routes of its 66,000 delivery drivers. The logistics company has successfully tested launching delivery drones from the top of a UPS van, which it hopes will be incorporated into day-to-day operations as the device is able to return to the vehicle autonomously while the driver makes a separate delivery

SUSTAINABILITY



Luke MacGregor/Bloomberg via Getty Images

Be sustainable because there is no Plan B

High street giant Marks & Spencer is leading the charge against abuses in the global supply chain with a long-term commitment to sustainability

JIM McCLELLAND

The year was 2007. Tony Blair was still prime minister and Sheffield United were in the Premier League. The iPhone had yet to reach the UK. It was a different time – time for Plan A.

Originally billed as an “eco-plan”, the first Marks & Spencer five-year Plan A launched that January. Its 100 commitments included becoming carbon neutral and sending zero waste to landfill.

Fast forward to 2017 and Plan A 2025 marked the tenth anniversary with 100 more commitments, including bold overarching ambitions to help ten million people live happy, healthier lives, transform 1,000 communities and be a zero-waste business.

Plan A is a mammoth undertaking. So far, M&S has delivered no fewer than 296 commitments, failing only 21. For Mike Barry, director of sustainable business (Plan A) at M&S, a unifying strategic value is what keeps it core to the business. “Plan A makes us more than a sum of the parts,” he says. “Rather than just 100 individual pieces of work going on, we have something that makes sure the business is consistent in what it does.”

The scope of Plan A ambition makes sense in the context of the sheer scale of the M&S retail operation. Any business selling 35,000 different product lines to 32 million customers must manage a diverse and complex global supply chain. From salmon-farming in Scotland to cocoa-growing in West Africa, supply routes encompass

some 20,000 farms, plus thousands of factories and raw material sources.

At product level, the requirement to have a Plan A “quality” standard – an eco or ethical benefit above the market norm, such as being Fairtrade or RSPCA Assured – drives supply chain sustainability, with 79 per cent compliance already.

At producer level, M&S has also led the way in putting a factory map up on its website, sharing what happens where in the world, not just for clothing and home products, but food too.

Supply chain visibility and transparency remain a major challenge for retail though. Along with adidas and Reebok, M&S came in the top three of Fashion Revolution’s *Fashion Transparency Index 2017*. However, the sector has a long

way to go on disclosure, explains Carry Somers, founder of Fashion Revolution. “Fashion supply chains are still fragmented and greater transparency will be key to transforming the industry,” she says. “If you can’t see it, you can’t fix it.”

Seeking supply chain transparency, tier by tier, is a tough ask of any one business alone, says Will Schreiber, a partner at 3Keel. “Most significant environmental and ethical sourcing risks happen far upstream in supply bases,” he says. “Collaboration is critical to addressing these across the industry and we’re starting to see convergence of standards.”

Whether tackling deforestation impacts of Brazilian soy production or sourcing better cotton in India, action-orientated collaboration can help, agrees Louise Nicholls, corporate head of human rights, food sustainability (Plan A) and food packaging at M&S. She says: “There are some great examples where the supply chain has come together with government and NGOs, and really driven change. The UK Modern Slavery Act, for instance, recognised the need to establish a level playing field because, in that case, regulation was actually good for business.”

Collective response is the only effective way forward on modern slavery, says David Camp, programme lead at business-led multi-stakeholder initiative Stronger Together. “Slavery was abolished

over 200 years ago, but never eradicated and there are more people in slavery today than ever before,” he says. “Retailers and brands play a crucial role, and it is essential competitors come together to develop consistent approaches, increase commercial leverage and speak with one voice. Collaboration is absolutely essential for changing the norms that have come to exist over decades and generations.”

A founder member of Stronger Together, M&S has published two human rights reports and last year topped the *Corporate Human Rights Benchmark* for fashion and food. M&S sponsors the UK modern slavery hotline, and its open-source modern slavery toolkit is also available to all suppliers and outside firms.

Despite all of this, plus the fact that 19 Plan A 2025 commitments are specifically about human rights, the threat of forced labour persists, Ms Nicholls acknowledges. “I don’t think it’s a case of if we find modern slavery, it’s when we find modern slavery. The reality is a criminal element in the supply chain is taking advantage and exploiting workers.”

Openness and pragmatism are paramount, she adds: “It’s not that you’ve got the issues that matters, it’s what you do about it. We are much more concerned about getting victims to safety, remediating issues, and if possible bringing criminals and perpetrators to justice. That’s what matters to us.”

The reality is a criminal element in the supply chain is taking advantage and exploiting workers

Looking ahead to the next ten years of Plan A, 2025 and beyond, M&S is building supply chain resilience by working lean. It is also anticipating game-changing supply chain impacts of a fourth industrial revolution, from blockchain and beef DNA, through robots and drones, to 3D printing and artificial intelligence.

In all of this, though, expect one constant, concludes Mr Barry: “One thing about sustainability is that it is a long-term systemic programme. Faced with disruption in the marketplace, environmentally, socially and economically, M&S will never stop driving sustainability into everything it does.” ♦

In addition to cutting its own food waste, M&S will introduce messaging and design changes to certain products to help customers prevent food waste in the home

Plan A commitments

Some key aims from the Plan A strategy

Marks & Spencer

80%

of the raw materials used by volume for M&S products will come from sustainable sources

50%

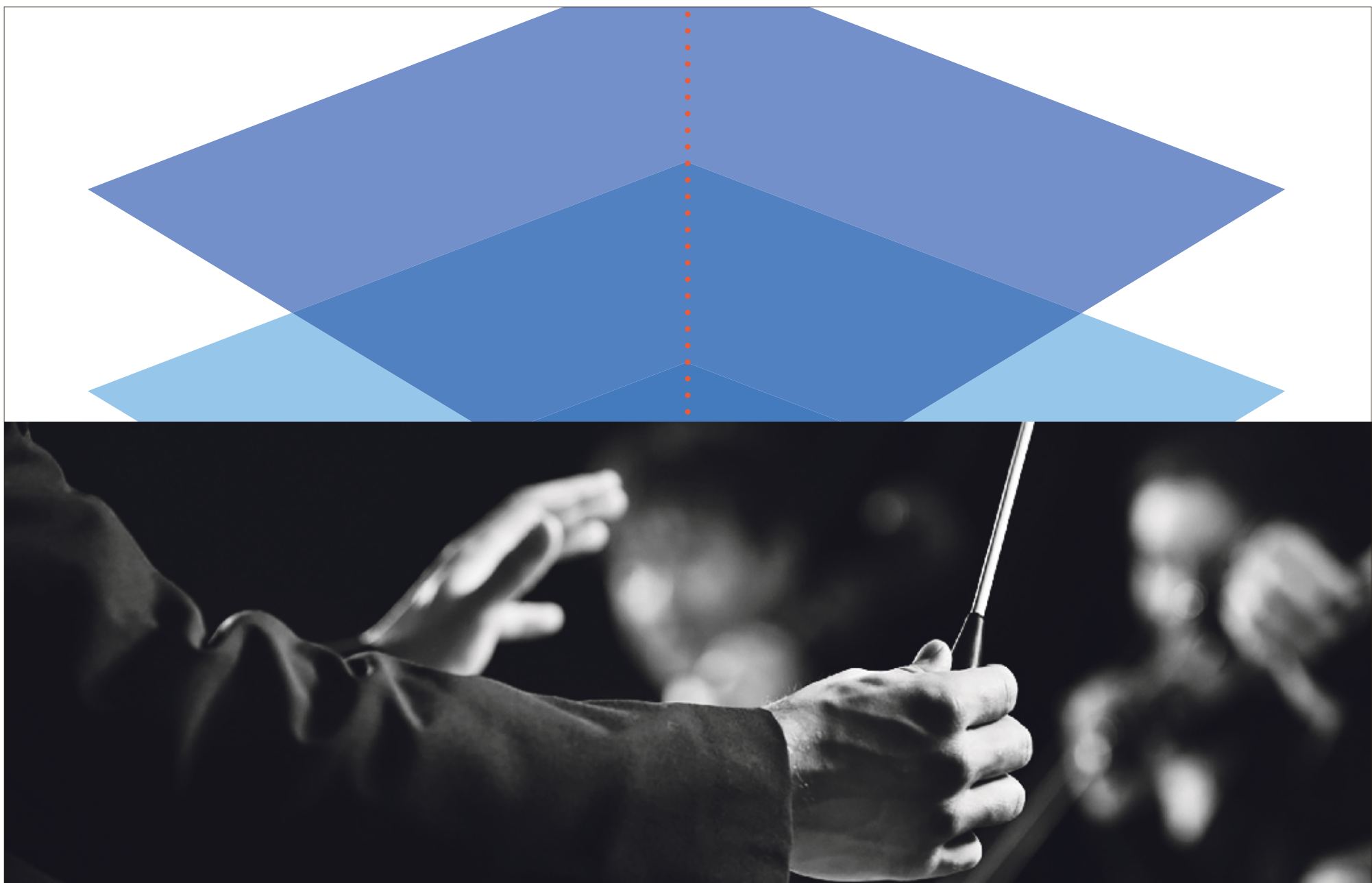
cut in net food waste relative to sales by 2025

90%

reduction in greenhouse gas emissions from global operations by 2035 compared with 2006-07

50%

of full-line M&S operated stores and offices in the UK will have space available for community groups and charities to use



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ROBOT TAX

CHARLES ORTON-JONES

The threat of mass unemployment at the hands of a robot army is a real concern. Robots are taking over jobs from cancer diagnoses to truck driving. And as the robots move in, humans get the boot. Perhaps worse, the taxman is robbed of the income tax the worker paid in.

Last year Microsoft billionaire Bill Gates offered a radical solution. He said: "Right now, the human worker who does, say, \$50,000 worth of work in a factory, that income is taxed and you get income tax, social security tax, all those things. If a robot comes in to do the same thing, you'd think that we'd tax the robot at a similar level."

Daft? Any idea coming from the (depending on stock prices) world's richest man needs taking seriously. He admits it's a tricky concept, but demands a conversation: "Exactly how you'd do it, measure it, you know, it's interesting for people to start talking about now."

Opinion is for it. A recent survey, by cloud accounting software provider FreeAgent, reveals 57 per cent of UK workers endorse a robot tax if a human is being put out of work. The research also shows 42 per cent of workers would be content taking orders from a robot boss.

In 2017, South Korea introduced a robot tax. Incentives for automated machines were curtailed to make up for income tax lost due to unemployed workers, so more of a tweak, than a tax, but the principle was established.

The robotics industry is unimpressed. "A robot tax is as absurd an idea as a tax on pencils," says Nigel Smith, managing director of TM Robotics, the sales partner for Toshiba Machine, the Japanese industrial robot manufacturer.

"The bottom line is that robots create jobs, they don't take them away. The UK government's recent *Made Smarter* review on digitalisation in industry concluded that over the next ten years automation could boost UK manufacturing by £455 billion, with a net gain of 175,000 jobs, while reducing CO₂ emissions by 4.5 per cent."

The problem is what do you tax? Tax experts aren't sure. Paul Falvey, tax partner at accountancy and business advisory firm BDO, says: "It would be very difficult to create a robot tax as such because, in practice, robots are not easily defined or identified. This is probably why a robot tax is much talked about, but hasn't been fully implemented."

There are possible avenues. Mr Falvey says: "For example, should we tax a machine's output? If so, how

57%

of UK workers would endorse a robot tax if a human is being put out of work

FreeAgent 2017



Could taxes on automated technologies such as the Heathrow self-driving pods discourage green vehicles?

Chris Ratcliffe/Bloomberg via Getty Images

A robot tax is as absurd an idea as a tax on pencils

says the revenue could be used to retrain displaced workers to jobs in hard-to-automate sectors.

Perhaps the biggest obstacle is the danger a tax poses to productivity. The UK already lags rivals in terms of output per hour worked. A robot tax would make this worse. Furthermore, robots will automate unpleasant work and inefficient practices.

Neil Kinson, chief of staff at Redwood Software, an automation specialist, offers a strong example of this negative effect. "Take the example of the Heathrow Pods. The fleet of autonomous vehicles that deliver you to the business parking at Terminal 5 proudly claim to eliminate thousands of bus journeys. If we were to implement a robot tax on these vehicles, we would create a perverse incentive to sustain particle-emitting diesel buses, rather than zero-emission autonomous pods," he says.

Against such difficulties, alternatives look more appealing. Helping those affected by automation is a front-runner. Dr Janet Bastiman, head of AI at StoryStream, sees the merits of this simple method. "If an individual is displaced by automation then they will need immediate reskilling to avoid long-term unemployment," she says. "Any ethical employer will want to ensure that their workers are looked after, so maybe there is scope for legislation to ensure the companies pay for some training. Even this would be difficult to define in detail enough that it would not be subject to abuse."

Having heard all the evidence, Dr Bastiman concludes: "Crippling innovation and progress through taxation is not the answer." Workers may think otherwise, but the current view of experts across tax, AI and robotics is that a tax is unworkable and undesirable. Do not expect to see a robot tax anytime soon. ♦

Robots could turn out to be a taxing idea

Proposal of a robot tax to safeguard government revenue and provide for displace workers is not as straightforward as it may at first appear

do you measure this? The rate of tax could perhaps be based on the cost of the labour that the robot replaced, but this would cause a number of further challenges, for example, humans have a finite lifespan, unlike robots."

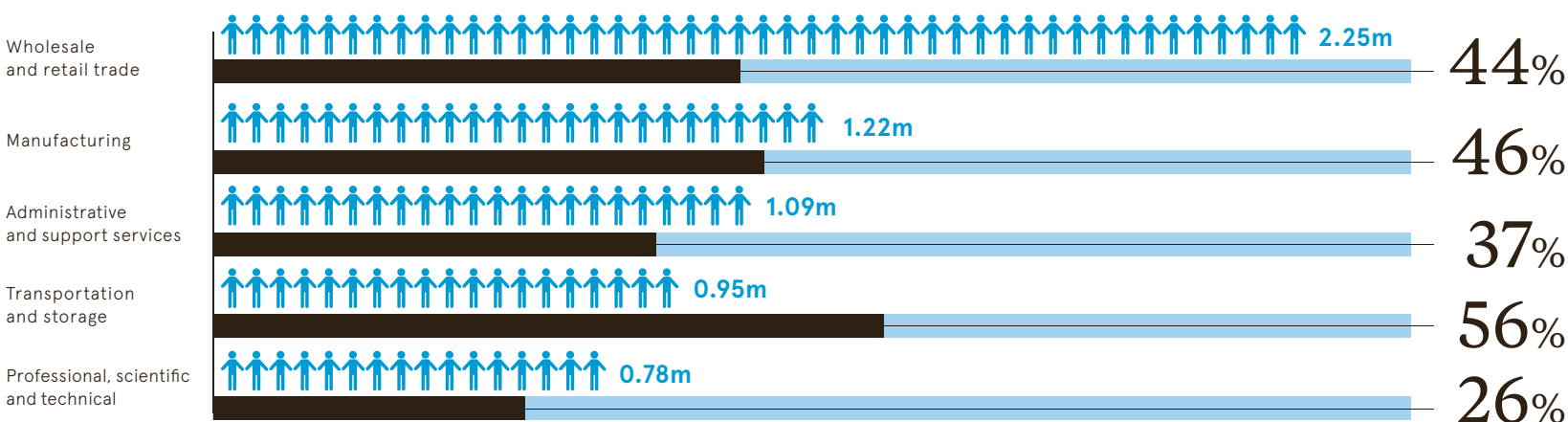
Perhaps a tax could vary according to the computing power of a robot. A pencil or teaspoon has no processor,

so would be exempt. Ian Hughes, senior analyst at 451 Research, suggests: "If a system was to be put in place, it may need to be a performance-related levy based on how many compute cycles a task took, billed as a micro-transaction." A neural network such as DeepMind's self-learning AlphaGo Zero engine would incur a hefty bill.

A sectoral tax might work. Russell James, vice president of vision and artificial intelligence (AI) at Imagination Technologies, which designs graphics chips for smartphones, says: "Taking the example of an autonomous taxi fleet, imposing a tax on the company running the autonomous taxis could be an option." He

Potential jobs at high risk of automation in UK industry

Percentage of total jobs Number of jobs ↑ = 50k



PwC 2017

'Authorised economic operator status is key to the frictionless border industry needs post-Brexit'

Whether you voted for Brexit or not, it really doesn't matter. It is here now; it is happening and we must work together to ensure the future success of our profession, so we can continue to propel national economic growth.

If there is one clarion call which I consistently recommend to government, it is the imperative importance of frictionless borders. It is vital that we achieve this to get UK products and services efficiently to market, both within Europe and further afield. However, the government cannot do this alone – we all have our parts to play.

Following the vote to leave the European Union, our profession has been in a period of continued uncertainty, but we must all be aware of the many opportunities that can arise from Brexit, and be ready and able to seize them and add value.

At the Chartered Institute of Logistics and Transport (CILT), we are championing authorised economic operator (AEO) certification to aid members to gain a competitive advantage, recognition for professional competence and trouble-free border crossings. Clearly, security at all border crossings is of vital importance, but how this is managed is also critical to commerce.

A 21st-century solution is required if goods and vehicles are going to flow smoothly. AEO is the crucial ticket to negotiating Brexit. It indicates that your role in the international supply chain is secure, and your customs controls and procedures are efficient and compliant.

Discussions of a no-deal exit and recognition that seamless borders are unlikely to be attainable means the UK must gear up to deal with the EU as it does with the rest of the world, which recognises AEO as the standard.

Throughout the industry, to be on the list for preferred suppliers and tenders, the question increasingly asked is: "Do you hold AEO status?" So I am encouraging CILT members, government and the profession to wake up to the advantage of being an authorised economic operator.

Reasons for low participation vary and include industry complacency, pressure on resources and cumbersome processing of applications. There is a looming risk that non-AEO forwarders will be left behind as the authorities, partners and customers worldwide choose to

deal only with authorised companies. Post-Brexit, an army of AEO-accredited operators will be central to achieving the smooth transition of borders to our markets.

The widespread adoption of a globally recognised standard such as AEO is essential not only to protect the UK's position once we leave the EU, but also potentially to enhance the UK's status as the country for international trade. The UK is well placed to be number one in logistics.

AEO status should give companies that have demonstrated their commitment to security in the supply chain access to what would in effect be a green lane through UK ports and airports. This is a complex, formal accreditation to achieve with a very low pass rate so far. Very few UK companies have it, very many will need it and I encourage all organisations to get on with it now.

Holding this status is going to be key to experiencing the frictionless border or green channel that industry wants and needs, in whatever shape is available post-Brexit. AEO offers an opportunity to demonstrate that the forwarding sector can lead the process in supporting the UK's position in global trade. If UK forwarders do not rise to the challenge, the sector will have lost its competitive advantage and will undermine its value to customers.

Now really is the time to get started. Those who have not yet decided to get AEO certification should be giving it serious consideration and government should think carefully about making this the must-have status for forwarders to enable the UK's economy to thrive in a post-Brexit world.



Kevin Richardson
Chief executive
Chartered Institute of Logistics
and Transport

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3D PRINTING

Supply chains are looking better in 3D

3D printing is proving a useful tool in enabling companies from multiple sectors to revolutionise their supply chains and make significant cost-savings

BEN ROSSI

Transforming computer-designed ideas into physical objects by applying layers of materials with a 3D printer is moving beyond early-use cases in manufacturing to make logistics more efficient and reduce costs across the supply chain.

MH Development Engineering, specialists in engineering bespoke systems and products, installed a 3D printer to enhance both its manufacturing business and systems design for research and development.

When creating systems that solve engineering problems, the company must be able to test concepts quickly. The 3D printer has aided this process by allowing prototyped parts to be created overnight.

"We wake up the next morning to an email from the printer telling us it has finished the components, while we are making our morning coffee," says Amy Taylor, a director at MH Development Engineering, which is currently working on electric vehicle projects as a direct result of buying the printer.

"The printer has reduced the cost of second-operation tooling and provided us with an additional income stream in terms of straight make-to-print manufacturing for our customers," Ms Taylor adds. "We are even printing packaging to house delicate components for one

customer, as the printed material is strong and protective yet lightweight enough to optimise freight costs around the world."

Leeds-based Crispin Orthotics, which manufactures made-to-measure orthoses for the NHS and private sector, uses 3D printers to replace multiple components, which previously made up a product, with one single finished item.

The company can 3D-scan leg braces, insoles and casts for broken limbs to match the person being treated, drastically reducing the logistics and supply chain.

The required body part is scanned with the 3D image and then imported into Crispin Orthotic's design software, which orthotic technicians use to adapt the model and make positional changes, such as altering the angle of a joint.

The adjusted model is sent to the design team who create a 3D orthotic device around the virtual model. Printing the model with a 3D printer from HP has halved Crispin Orthotic's cost per part for producing orthoses, removing the need for multiple components in the supply chain and assembly.

"3D scanning and printing have revolutionised the speed and quality of parts we're able to produce for clients," says Mark Thaxter, managing director at Crispin Orthotics. "Having the ability to create a bespoke device that is lightweight, durable and accurate to 0.5mm has obvious benefits to the user."

Using 3D scanning and printing provides greater freedom on the design of products, particularly those with complex geometry. And by providing the ability to vary the thickness of a device in certain parts, it allows companies to produce products not possible with current manufacturing methods.

Croom Precision Medical, which manufactures medical devices, has been utilising additive technology for product iteration and production support since 2007. Last year, the company invested in metallic additive manufacturing



3D scanning and printing have revolutionised the speed and quality of parts we're able to produce for clients

technology, placing it in a regulated production environment.

3D printers from engineering firm Renishaw enable Croom's internal research, development and innovation team to look at all aspects of the additive process, from the incoming materials inspection to the post-processing supply chain.

"It has been an extremely useful technology in creating quick and accurate prototypes for customer use," says Patrick Byrnes, Croom's managing director. "It's imperative that we gain a substantial understanding of what the process is doing at any one time. The technology ensures we supply accurate and compliant parts to our customers."

"Through this technology, we have been able to serve markets we never thought possible. On the other side, we are now dealing with a new group of suppliers from a material and equipment aspect. This has also been a steep learning curve where relationships are formed on evolving competencies on both sides of the fence."

The Port of Rotterdam, the largest in Europe, deployed the world's first class-approved 3D-printed propeller. Previously, if a vessel

01 3D printing has driven rapid product development with greater freedom of product design, enabling companies to create prototypes quickly

02 RAMLAB at the Port of Rotterdam combines additive and subtractive manufacturing technologies to 3D-print large ship components

came into port needing a replacement part, it could take months to deliver. It was also costly to keep large stockpiles of parts in warehouses around the world.

To tackle this challenge, the port opened an on-site facility, RAMLAB, which combines additive and subtractive manufacturing methodologies, including a pair of six-axis robotic arms capable of additively manufacturing large metal industrial parts. Assisted by software firm Autodesk, the hybrid approach allows RAMLAB to 3D-print large ship components in metal and then finish the pieces within a matter of days, saving time and money without sacrificing precision or performance.

"With the work being done at RAMLAB, the group hopes to accelerate the cross-industry adoption of hybrid manufacturing for making large-scale parts on demand," says Vincent Wegener, managing director at RAMLAB. "Our aim is to make the Port of Rotterdam not just an important gateway for Europe, but also a leader in the development of new manufacturing methods."

From product development and manufacturing to maintenance and delivery, managing the supply chain for a product made up of many materials is a deeply complex task. 3D printing continues to gain pace across sectors as a technology for improving logistics and greatly simplifying this process.

As 3D printing moves towards the mainstream, it is set to unlock millions of pounds in cost-savings, which businesses can reinvest in their research and development to progress innovation. ♦



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