

Delivered.

THE GLOBAL LOGISTICS MAGAZINE

ISSUE 02/2019

BUSINESS

WRAP BATTLE

Learn how to tackle e-commerce packaging waste

SOLUTIONS

GOING DEEP

Discover a new way to increase productivity at work

VIEWPOINTS

APPETITE FOR DISRUPTION

Understand the forces shaping growth in Latin America



MOVING THE NEEDLE

How 5G networks are set
to change our world



DEAR READER,

How will 5G networks change our world? The next revolution in mobile communications is coming and, as we highlight in our **Technology Focus** this issue, could initially have a massive impact on business and industrial users, including the logistics industry.

Talking of upgrading, semiconductor maker Infineon is always looking to develop its supply chain operations. That's not surprising because annually it manages 1.5 million shipments to customers in 50 countries around the world. In our **Executive view** feature, we talk to Roxane Desmicht, the company's Senior Director Corporate Supply Chain for the Asia Pacific region, to find out why Infineon is currently adding a new layer to its supply chain management architecture.

For convenience and variety, online shopping has been a boon for customers. But there is a downside: It has also generated extra plastic packaging which is detrimental to the environment. In **Better by design**, we investigate the scale of the problem and outline some workable solutions.

Finally, we look at why Latin America is the fastest-growing region for disruptive business models, and the effects these could have on productivity in the region.

Enjoy your read!

Sincerely,

Katja Busch
Chief Commercial Officer, DHL

Cover photo: Getty Images

Photos on this page: DHL, David McNew/AFP/Getty Images; Stocksnapper/Adobe Stock; Hagen Hopkins/Getty Images



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www.delivered.dhl.com



IN THE BAG


DHL Global Forwarding (DGF) is to expand its Flexitank network, launching pilot projects in the Benelux countries, Spain, Argentina, Brazil, Thailand and Malaysia. Flexitanks, which use multilayer bags fitted to standard containers to transport non-hazardous liquids such as food oils and juice, can cut costs by up to 30 percent compared to steel ISO tanks, which need cleaning and a return load to make them financially efficient. DGF, which is partnering on the project with SGS, the world's leading inspection, verification, testing and certification company, aims to expand its current Flexitank network to include 60 countries by next year.

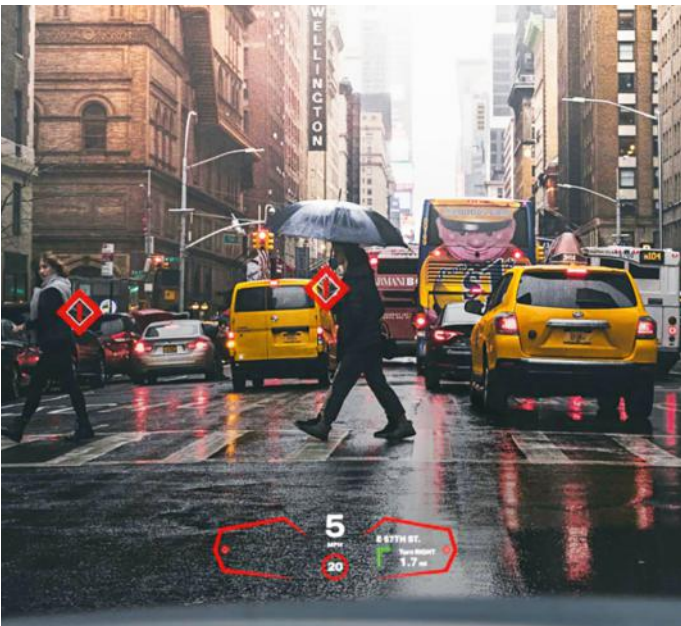
 bit.ly/dhl-sgs-flexitank



THE FUTURE'S BRIGHT


Advances in technology such as robotics, augmented reality and smart connectivity with the internet of things have brought change and innovation to the logistics industry. As part of a €260 million (\$300 million) investment, DHL Supply Chain is deploying these emerging technologies in 350 of its 430 facilities in North America. The rollout will include DHL's proprietary end-to-end visibility solution, MySupplyChain, and forms part of the group's global digitalization strategy. A recent DHL report found that 65 percent of companies saw the growth of e-commerce and its implications on service as having an impact on their supply chains. Implementing new technology can help support faster delivery times and manage fluctuating demand – in some cases it already has, producing productivity gains of more than 25 percent and throughput capacity gains of 30 percent. In DHL's case, innovations such as piece-picking robots, artificial intelligence applications and self-driving vehicles have already shown great promise.

 bit.ly/dsc-emerging-technologies



HEADS-UP ON THE FUTURE OF DRIVING

The CES technology show in Las Vegas also showcased a revolutionary holographic display system for cars. British firm Envisics says it has developed a system that uses "true holography" rather than projecting information such as speed and distance onto the windscreen like existing heads-up displays. BBC reporter Chris Fox, who was given a sneak preview of the technology, said that it really did feel as though the graphics were "floating on the road." Apart from the standard dashboard information, the Envisics system can also show lanechange instructions in the distance and mark points of interest as you pass them.

 www.envisics.com

AFTER A FASHION


If there's one thing that's guaranteed to change, it's fashion. Keeping on top of the latest trends and customer expectations is an essential part of the fashion industry's armoury and it's with that in mind that DHL has conducted a survey to give an overview of consumers' buying habits – and their reasons for making those purchases. The company is a longstanding logistics partner for designers, events and brands, as well as for Fashion Weeks around the world. It commissioned the survey to underline the importance of a smoothly operating global network, precision, dependability and speed in the fashion world. Some 6,000 participants in the U.K., U.S., Italy, Australia and Japan took part in the survey and the findings were insightful. Where U.K. consumers placed ethical production methods highly, women in Japan gave priority to the quality of the items they were buying. Overall, 15 percent of buyers will read a clothing label to see where the piece was made – in Italy this number is as high as 41 percent. Environmental concerns are to the fore as well, ensuring that the supply chain involved in getting a garment from maker to buyer is not having an unduly negative effect on the planet. And younger buyers are increasingly concerned about the social aspects of the clothes they are buying: Are they being made by workers who are earning a decent wage under good conditions?

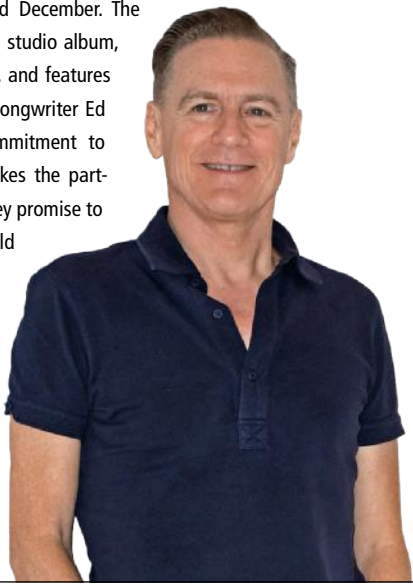
 bit.ly/dhl-fashion-survey



SUMMER OF '69

Global rock icon Bryan Adams has found the ultimate "roadies" for his latest world tour – DHL are providing the official logistics support for the band during their 2019 "Shine A Light" tour. Together, they are traveling across more than 20 countries between February and December. The tour is named after Adam's 14th studio album, which was released on March 1, and features a single co-written with singer-songwriter Ed Sheeran. DHL and Adams' commitment to environmental sustainability makes the partnership a perfect fit. Together, they promise to plant one tree for every ticket sold worldwide!

 bit.ly/dhl-bryan-adams



45 PERCENT

The share of millennial-controlled wealth in Asia Pacific, which has now overtaken the Americas, Europe, the Middle East and Africa. In his new book, *The 4th Industrial Revolution*, futurologist Rocky Scopelliti says China's millennials are now "a \$9 trillion economic force to be reckoned with"

THE LAST STRAW?

2018 was the year corporates woke up to their environmental responsibilities. Coffee giant Starbucks promised to phase out single-use plastic straws by next year, and American Airlines ditched plastics in its airport lounges and on flights, switching to biodegradable straws, wooden stirrers and bamboo utensils. Last September, McDonald's replaced all plastic straws in its U.K. restaurants with paper ones. And brands like H&M and Unilever are working with the World Economic Forum and academic institutions to create a circular economy for plastic so that – by 2025 – none goes to landfill or ends up in our oceans.



Photos: SGS; Getty Images (2); Eventpress; Schulz; Eigens/Adobe Stock; Envisics; DHL



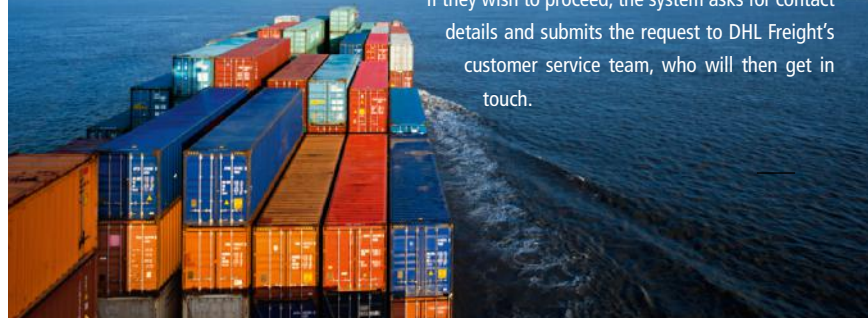
WHEN BIGGER REALLY IS BETTER

For the first time, DHL Freight is set to pair Iveco's next-generation Liquefied Natural Gas (LNG) truck with a megatrailer, which offers a higher load capacity and increased fuel efficiency. A trial in Germany will see the truck shuttle between DHL's logistics centers and BMW's production plant during the day. At night it will perform turnarounds between freight terminals in southern Germany. Providing an environmentally friendly solution and a three meter internal loading height, the megatrailer is particularly attractive to the automotive industry. DHL Freight already has experience with LNG trucks in Belgium, using four of the long-range, heavy-duty vehicles as part of a sustainable transport solution for one of the world's largest athletic footwear and sportswear companies. Deutsche Post DHL Group is committed to reducing its logistics-related emissions to net zero by 2050, and LNG trucks offer 15 percent higher fuel efficiency compared to traditional diesel engines. They have a range of 1,500 kilometers and, importantly, also emit 99 percent less particulate matter and 70 percent less nitrogen oxide than current Euro 6 diesel standards.

QUICK QUOTES

To help customers navigate the crowded, competitive and complex road freight market, DHL Freight has launched a new online quotation tool that provides a quick and easy idea of shipping costs for consignments. Aimed at small to medium-sized businesses, the Freight Quotation Tool allows customers to get fast prices and transit times for shipments up to 2,500 kilograms, and is available in 23 languages across 28 countries. All a user has to do is enter the area codes of their shipment's origin and destination, as well as size, number of pieces and weight, and they will receive an instant quotation and transit time estimate. Customers don't have to register for the initial quotation, but

if they wish to proceed, the system asks for contact details and submits the request to DHL Freight's customer service team, who will then get in touch.



LIFTOFF FOR COPENHAGEN

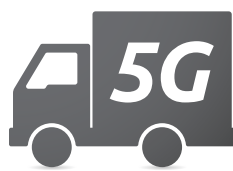
A new hub at Copenhagen Airport is set to be DHL Express's largest investment in Denmark and the Nordic countries. Due to open in 2023, the hub will be able to handle nearly 37,000 packages per hour, 24 hours a day, and will create 100 new jobs. Packages to Denmark usually travel via DHL hubs in Germany or the U.K., but the new 1 billion kroner (\$152 million) facility, based in the eastern freight area of the airport, will let planes reach their destinations more directly and, with fewer stops, allow for faster delivery.



THE HUMAN FACTOR

DHL has a long tradition of serving humanitarian customers, and has had contracts with the likes of U.N. organizations including UNICEF and UNHCR. To build on this work and to celebrate the successful worldwide implementation of the group's Humanitarian Logistics Strategy, the company is to set up a Global Humanitarian Logistics Competence Center (GHLCC) in the United Arab Emirates. The GHLCC, based in Dubai, will enable humanitarian operations to have a single point of contact and consistent and stable operations teams. The city is ideally placed as a central hub for worldwide operations. The GHLCC setup is based on a digital business model with a 4PL control tower at its core. It will cover the whole range of logistics and supply chain services, including freight forwarding, express and courier services, warehousing and distribution. There will also be a strong link to DHL's life sciences and healthcare divisions, which can meet the requirements for many humanitarian shipments that may need temperature or environment controls – medicines, for example.

 bit.ly/dhl-ghlcc



5G FORCE: WHAT FASTER TELECOMS MEAN FOR LOGISTICS

As the next generation of mobile technology, 5G heralds the promise of an even smarter, more connected world with 1.2 billion 5G mobile connections by 2025 globally. What are the implications of this new technology for the logistics industry? How do you make sure your supply chains are ready to ensure most efficient and reliable roll-outs? How can it make your supply chain smarter and in which cases can the tech already be used? As the industry leader in Telco Logistics, DHL Supply Chain connected with key players from the 5G ecosystem to explore these questions, resulting in the DHL Supply Chain 5G report. To read the report, go to:

 bit.ly/dsc-5g-report

STRENGTH THROUGH DIVERSITY

The title of this year's Corporate Responsibility Report sums up the values that guide the actions within Deutsche Post DHL Group. About 550,000 employees, across every country and culture where the Group operates, work with purpose and motivation to proudly represent the brands, with each individual contributing toward the group's ethical and ecological goals. Deutsche Post DHL Group wants to be leading in logistics: both as a benchmark for responsible business and as a pioneer in green logistics. With particular focus on the environment, employees and corporate governance, the 2018 Corporate Responsibility Report – "Strength Through Diversity" – is now available to download. To find out more, visit:

 www.dpdhl.com/cr-report



A LONGER SHELF LIFE

How's this for a bright idea? Sweden has the world's first recycling mall, where everything sold is recycled, reused or has been organically or sustainably produced. The shopping center, ReTuna Aterbruksgalleria in the city of Eskilstuna, has been trading for more than three years and, in 2017, chalked up 10.2 million kronor (\$1.10 million) in sales of recycled goods. Not only that, it's also right next door to a recycling center, so customers can also bring items they no longer want, some of which end up back on the shelves of the mall's shops.

 www.retuna.se/sidor/in-english

SALAH'S ONSIDE WITH FANS

In an age where anybody can make contact with their favorite celebrity at the click of a button, inboxes are full and notifications go ignored. But not if you're Mohamed Salah! In a campaign which translates as #TheHumanNetwork and in line with DHL's 50th anniversary celebrations, 50 fans from across the Middle East and North Africa region won the opportunity to send personal gifts, letters and artworks to the football legend and leading premiership goal scorer, which were delivered directly by DHL Express. Known by many as "The Egyptian King" and hailed as "a world-class player," by many well-known global footballers, Salah announced via Twitter: "Time to get in touch, for real," to his 7.89 million followers. He took a 72 hour social media blackout before the competition, which ended on February 15. Watch the video here:

 bit.ly/dhl-mosalah



71 PERCENT

The proportion of EU citizens in favor of the union's common free trade policy, according to the European Commission's public opinion survey Eurobarometer last November

 bit.ly/eu-elections-2019



THE FIFTH GENERATION

5G networks will change everything,
except maybe your phone.

TRUE BLUE TECH:
A video introducing Qualcomm
5G technology at the Las Vegas
Convention Center.

Ten years after the launch of the first commercial 4G mobile networks, the next revolution in mobile communications is just around the corner. Across the world, telecommunications companies are gearing up for the rollout of fifth generation (5G) networks. Around 20 operators expect to launch 5G services during 2019, although it will probably be 2020 before the network infrastructure required to support widespread adoption is in place.

Industry players are spending eye-watering sums in the race to make 5G a reality. The U.K. raised £1.4 billion (\$1.8 billion) in an auction of radio spectrum for 5G services last year. A bidding war in Italy saw its spectrum sell for €6.5 billion (\$7.4 billion) in October. A similar auction in Germany this spring is expected to raise €5 billion (\$5.7 billion), provided legal objections by operators can be overcome.

Those numbers are only part of the story, however. Once they have acquired the rights to parts of the radio spectrum, operators need to build the networks to use them. Consultancy Accenture estimates that U.S. operators will spend up to \$275 billion over the next seven years to build their 5G networks.

With so much on the line, 5G technology must offer some compelling benefits and speed is the feature that

usually receives the most attention. 5G networks will allow devices to download data at more than 1 gigabit per second (1gb/s). That is at least 10 to 100 times faster than today's 4G services. At demonstrator sites, operators have wowed audiences with displays of bandwidth, simultaneously transmitting a 360-degree virtual reality display and 12 ultra-high-definition video streams over a single network connection, for example.

Speed limits

Those blistering speeds will allow users to do things that would not have been possible in the past, like downloading a large movie to their phone in just a couple of seconds, for example. However, when did you last need to download a whole film to your phone over a mobile network? The advent of cloud computing has dramatically reduced the need for most people to carry masses of data around in their pockets. A good 4G connection is more than adequate to stream high-quality video to the screen of a mobile device.

In reality, says Guido Weissbrich, Director of Network Planning and Optimization at mobile operator Vodafone, "It's hard to imagine a use case that requires more than 1 gigabyte per second (GB/s) in mobile, although the future may prove me wrong." Instead, he points to three other dimensions that differentiate 5G networks from their predecessors: capacity, latency, and customization. The first two of those dimensions are evolutionary, he says, but the third is revolutionary.

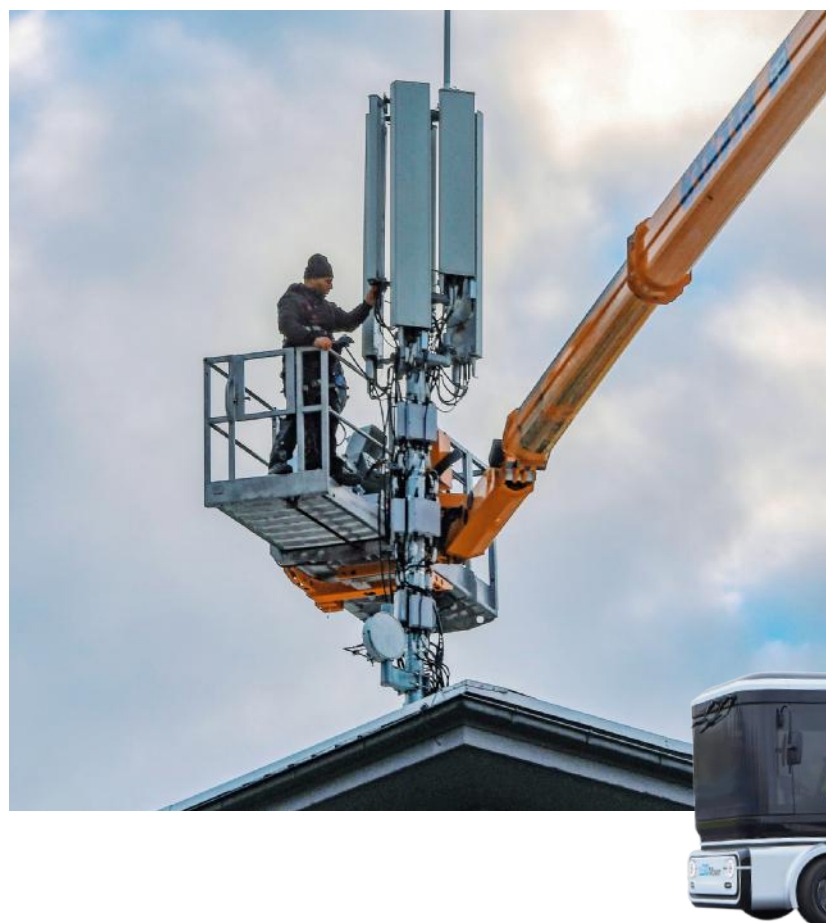
Capacity matters

Capacity is the reason network operators have no choice but to invest in 5G. The phenomenal success of smart devices, connected vehicles and the internet of things is putting today's mobile data networks under increasing strain. "Right now, we're experiencing 50 percent year-on-year growth in mobile data traffic," says Weissbrich. "If you project that forward, then by 2022 or 2023 mobile operators will not be able to fulfill the demand for data services using the spectrum they have available, especially in densely populated areas."

To be prepared for these challenges, Operators need to find ways to improve "spectral efficiency." "It's about getting more bandwidth out of the air," says Weissbrich. "Capacity is related to speed, but we are really talking about being able to meet the demand in the areas that need it."

DRIVE TIME:

Autonomous vehicles are putting outdated networks under strain.



KEEPING IN TOUCH: Huawei Technologies unveils its first 5G foldable smartphone, which opens out to become a tablet.

NETWORK BUILDING:

U.S. operators are set to spend billions in creating 5G networks.

Consultancy BCG estimates that improvements to 4G networks should roughly halve the cost of delivering each gigabyte of data traffic over the next six years, but then the savings will tail off. 5G technology, by contrast, could slash those costs by as much as 90 percent over the same period. So as well as boosting the capacity of mobile networks, 5G technology should also make them dramatically cheaper for operators over time.

Responsiveness

The second big change is latency. Today, when a user presses the "submit" button on a Google search, it takes around 50 milliseconds for the request to travel across the network to Google's servers, and for the search result to make the return journey. In a 5G network, that round-trip time will fall to around one millisecond.

Those fractions of a second saved will make little difference to the casual web user, but they are fundamental in a wide range of other applications. A low-latency network is essential for the real-time control of equipment like autonomous forklifts or robots, the wireless control of production lines or complex industrial processes. Low-latency networks in deep harmony with other technologies like cameras, sensors or Wi-Fi are also considered an essential technology for self-driving cars, allowing them to communicate with each other quickly enough to make safety-critical decisions.

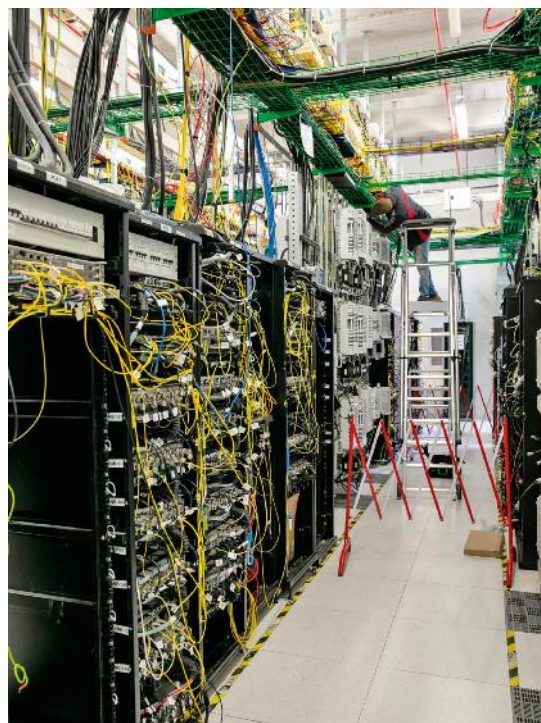
5G IN LOGISTICS

The logistics sector is just the sort of high-value 5G industrial client that network operators hope will become big customers of 5G technology. In addition, like many other business users, logistics players are likely to be attracted to 5G by characteristics that have little to do with peak download speeds.

In warehouse operations, the long range and low latency of 5G might be ideal for the control and coordination of emerging robotics and automation technologies, from autonomous forklifts to augmented reality systems that guide and support human workers. Out in the wider world, meanwhile, 5G's ability to provide tailored services could underpin a new generation of smart tags and tracking devices better suited to certain logistics operations than today's equivalents. That could open the possibility of real-time indoor positioning as well as smart real-time tracking of a far larger array of products and packages, not just the most sensitive or high-value items. In other words, it enables us to accurately locate an asset both indoors in closed spaces as well as outdoors – and potentially globally.

"This is a truly exciting time in the evolution of mobile data," says Siegers. "With the first of the networks going live this year, we are just beginning to see the possibilities of this technology. In the long term, 5G could play a fundamental role in changes that transform our industry and many others." One example, he says, is the use of 5G networks to enable "truck platooning," a technique where fleets of vehicles can operate close together on motorways and similar environments under autonomous control. Proponents of the approach say it will improve efficiency, reduce congestion and help to alleviate problems caused by driver shortages.

Photos: David McNew/AFP/Getty Images (previous page); Winfried Rothert/Imago; Valéry Kloubert/Vodafone; Stringer/Imagineddp



WIRED IN:
Operators may need to build real-time data centers in preparation for 5G.

Tailor-made

The third major dimension, and the one that Weissbrich describes as revolutionary, lies in the way operators will implement 5G networks. 5G technology allows for an approach called “network slicing.” This means that, rather than all users connecting to the same network, operators can carve out subnetworks with characteristics tuned to suit the specific requirements of their customers. A network slice aimed at consumers might emphasize fast download speeds and wide geographical coverage, for example. One designed for autonomous cars might prioritize low latency, and a network for internet-of-things devices might be slower, but optimized for low power consumption.

If you build it, will they come?

Of course, to turn potential into reality, operators like Vodafone need to actually start building their 5G networks. That is going to be a complex undertaking. Thousands of existing network base stations operators have to modify, for example with new “beam-form-

ing active antennae” added alongside the existing 4G equipment. The connections between base stations and the rest of the network require upgrading too. Operators do that with a combination of high capacity optical fiber cables and microwave radio links.

In areas of high demand, operators will also need to install many additional antennae to create denser networks and deploy smaller base stations, more like a Wi-Fi router than a conventional mobile phone mast. These will provide extremely localized coverage, perhaps connecting users within a 50-meter radius.

However, antennae and cables are only part of the story. The high-speed, low latency networks required to manage communication with autonomous cars or industrial control systems will also require fundamental changes to upstream infrastructure. The overwhelming need for responsiveness in these applications is driving the development of the “edge cloud,” an approach to networked computing where tasks shift from centralized data centers to infrastructure located as close as practical to the point of use.

Operators see the appetite for edge infrastructure as a major business opportunity. Vodafone is planning to build real-time data centers, which it embeds in the extremities of its network, allowing them to deliver services without the need to shuttle data backward and forward over hundreds of kilometers of internet cables. Ultimately, this might involve computers installed inside a 5G base station on a corporate campus or industrial site, running dedicated applications for that particular customer.

Who’s first?

In the short term, says Rob Siegers, President Global Technology, DHL, it is clear that operators are targeting business and industrial users as the first major customers for 5G services. “While the evolution from 2G to 4G had a big impact on the way end consumers used mobile phones and data services, it looks like the effect of 5G will be more incremental for them. At the moment, the major emerging opportunities from the technology are in new and expanded business applications.”

Vodafone, says Weissbrich, is already talking to business users about the installation of localized 5G networks on campus sites, or private 5G networks. The company has also opened a 5G mobility lab in Germany to support technical development work with automotive customers.

5G for the people

In addition, even as the technology moves into the consumer space, it looks as if mobile handsets will not be at the front of the line. Operators are excited about the potential of “fixed mobile broadband”: 5G connections that will deliver internet connectivity to homes and offices. That technology will allow mobile operators to

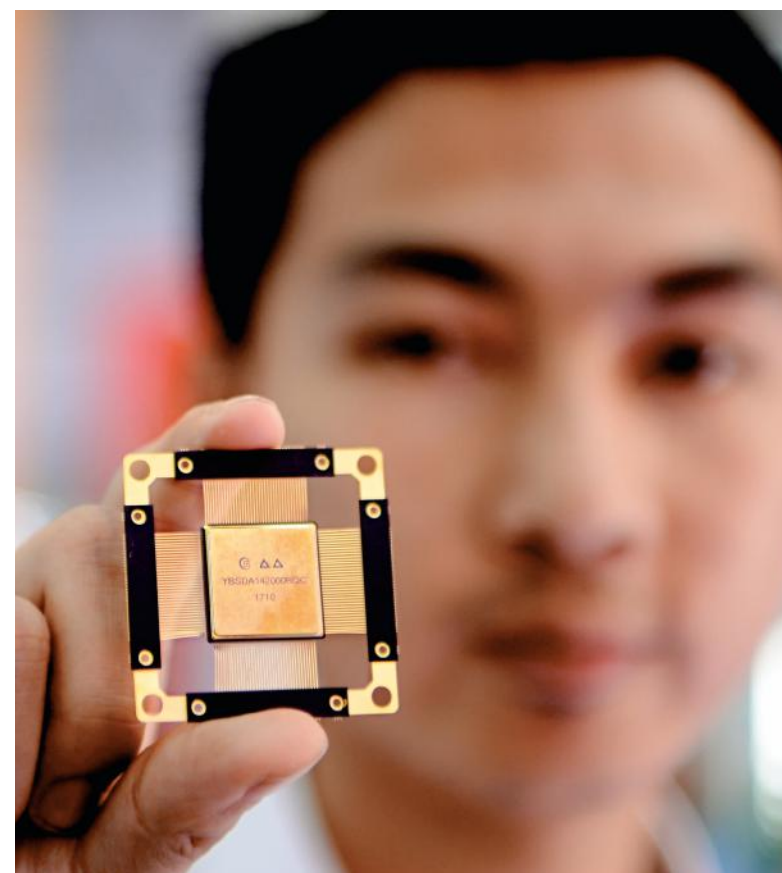
compete with conventional broadband providers, and will also help to bring fast connections to locations that don’t currently have access to fixed line services, e.g. via fiber or cable.

So what about 5G in your pocket? It is coming, but not quite yet. Many manufacturers including Huawei, LG, Samsung and Xiaomi introduced 5G-ready smartphones at the Mobile World Congress in February. These phones are yet to come to the market.

There are plenty of hurdles that business, industry and operators have to overcome between now and then. 5G technology is right on the frontline of global political and trade tensions, with the U.S. and several of its allies raising security concerns about the use of Chinese equipment in critical network infrastructure.

Operators like Vodafone, meanwhile, need to ensure that their investments in 5G networks are a commercial as well as a technical success. In Europe, Weissbrich points out, high prices paid for radio spectrum licenses could leave operators with less to spend on network infrastructure. “We need to ensure that we create an environment that is investment-friendly,” he says. “5G is a worldwide competition, with the U.S. and China pushing very hard right now. If Europe wants to keep pace, it’s important that politicians, network operators, equipment manufacturers and industry players are all on the same page.” ■ Jonathan Ward

TAKE FIVE:
5G converter technology on display at the 2018 Digital China Exhibition.



Photos: Sipa Press/action press; Wei Peiquan Xinhua/eyevine/picture press; DHL

3 QUESTIONS FOR

Rob Siegers,
President Global
Technology,
DHL Customer
Solutions &
Innovation



1. What are the major trends influencing the evolution of the technology sector right now?

The big talking point right now has to be 5G. That’s because this will be the year that the new mobile data technology begins its transition from theory to practical application. Operators are starting to plan and build their networks, and we will see the first 5G-compatible equipment coming onto the market. 5G is also a significant building block in many of the other technology trends that already underway, such as the internet of things and the development of connected cars and new mobility solutions.

2. Where do you believe that 5G will have the greatest impact?

It’s too early to say! We know that the demand for mobile data services is continuing to grow extremely rapidly, and 5G will play an important part in fulfilling that demand, alongside continued investment in today’s networks. Plenty of existing and new cases are out there that will benefit from the speed and capacity offered by 5G, everything from advanced manufacturing systems to remote medicine. Nevertheless, it’s also true that the “killer app” for 5G technology has not yet emerged. As with previous generations of communications technology, the most significant applications may surprise us all.

3. Do you believe 5G technology will have important implications for the logistics industry?

There’s broad consensus that business and industry will drive the adoption of 5G technology rather than consumers, at least in the early stages. I’m sure that logistics is one of the industries that will find innovative applications. We deal with complex networks of physical assets and large quantities of data, which is exactly where business and industry expect 5G to have a significant impact. Potential applications range from improved track-and-trace technologies to warehouse automation and eventually autonomous vehicles.

“Right now, we’re experiencing 50 percent year-on-year growth in mobile data traffic.”

Guido Weissbrich, Director of Network Planning and Optimization at Vodafone



ROXANE DESMICHT
Infineon's Senior Director
Corporate Supply Chain
(CSC) Asia Pacific

WHERE DIGITAL MEETS PHYSICAL

For leading semiconductor maker Infineon, the supply chain has become a key source of competitive advantage.

Without knowing it, you've probably already used several products from Infineon Technologies today. The company designs and manufactures specialized semiconductors that play a vital role in the ongoing digitalization of the world around us. Infineon is the world's second-largest supplier of automotive integrated circuits (ICs), for example. It is a leading provider of power electronics devices, used in industrial machinery, trains and electricity infrastructure. And it makes special security chips that are embedded into passports, identity cards and access control systems.

Those may appear to be niche segments, but Infineon's chosen niches are big and growing fast. Revenues reached €7.6 billion in 2018, up from €4.3 billion in 2014, and the company now employs just over 40,000 people worldwide. Its roots are in Germany: Infineon came into existence in 1999 when industrial conglomerate Siemens spun out its semiconductor operations. But while its HQ is still in Neubiberg near Munich, Infineon has become a truly global operation. More of its staff are now based in Asia than in Europe, for example.

Today, the company sells around 36 billion individual components every year. It manages 1.5 million separate shipments between 100 manufacturing locations, five major regional warehouses and 1,500 customer sites in 50 different countries.

From features to solutions

Roxane Desmicht, Infineon's Senior Director Corporate Supply Chain for the Asia Pacific region, notes that the company's global shift has been paralleled by an equally important but subtler change in competitive dynamics over the past two decades. "We have always been an intensely IP-focused company, and like many technology companies we tended to compete on product functionality," she says. "But sometimes, the technology reaches a limit. Then the customer won't just be sensitive to product features, they will also be sensitive to the way the product is delivered."

Recognizing that change, Desmicht says that Infineon "strives to create added value for the customer by not just delivering product but also a solution." An

example of this approach, she adds, is the full traceability that customers can request for many products. "If a customer wants to understand when a specific device was manufactured and in which of our factories, we can provide that information." That level of traceability is particularly important to Infineon's automotive customers, who operate highly sophisticated quality systems and want to be able to conduct detailed root cause analyses if issues occur.

Speed and flexibility

Another solution that offers real value to customers is flexibility. They want the confidence that the parts they need will be available when they need them. However, short lead times and variable demand are big asks for the semiconductor sector. "A key challenge in our supply chain is that the manufacturing lead times for products like ours are always very long," says Desmicht. "A best-case scenario would be four months between the first manufacturing step and delivery to the customer, but we have some products with a manufacturing cycle of up to a year."

Infineon combines an array of approaches to ensure it can offer customers greater flexibility than those long cycle times would suggest. It has configured its manufacturing plants so two or even three facilities are able to make the same product, for example, making it easier to balance demand and available capacity. It also operates a system of intermediate stocking points, which hold unfinished components that may be used in multiple end products. And where appropriate, it outsources elements of production to external providers.

Those levers can only operate effectively, however, if there is a robust planning process in place to ensure that the right inventory is positioned across the supply chain, and that the available manufacturing resources are allocated appropriately. That makes planning a core part of Infineon's supply chain strategy. "We have always been a strong planning organization," says Desmicht. "And we strive to improve our planning processes wherever possible."

Eight years ago, for example, Infineon partnered with an external software company to co-develop a comprehensive Sales & Operations Planning (S&OP)

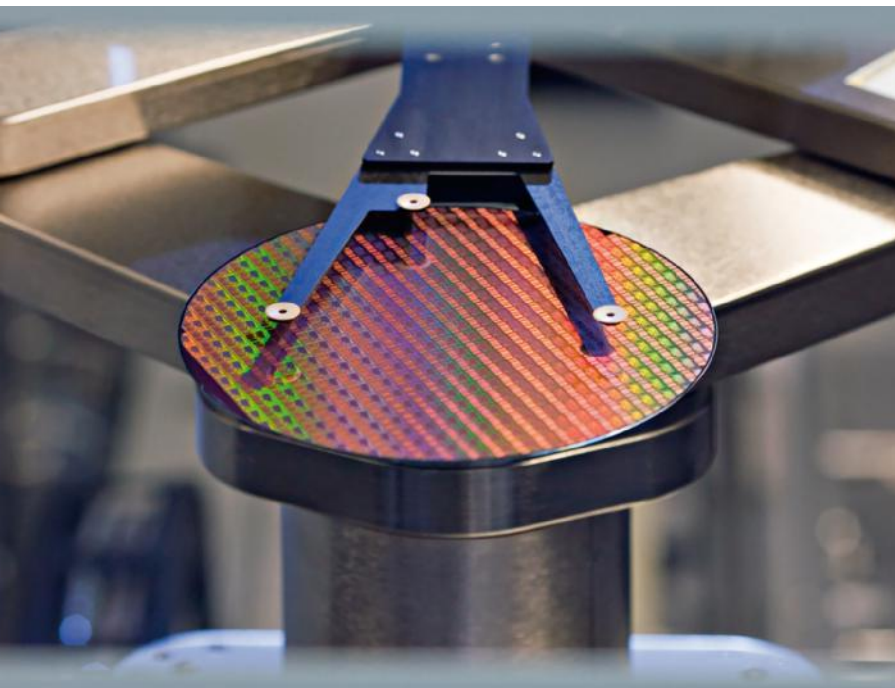
36
BILLION

The amount of individual components made every year

1.5
MILLION

The number of separate shipments every year

Photo: Juliana Tan for Delivered.



DELICATE OPERATION:
Infineon's products operate at the boundary between the digital and physical worlds.

system. At the time, says Desmicht, that approach was a first for the semiconductor sector. "That tool is now commercially available, but as the first user, we had an edge in using the tool, and we were able to enhance its functionality."

Smarter networks

The S&OP tool is just one piece in a larger jigsaw of systems that Infineon uses to manage its supply chain and manufacturing operations, and Desmicht notes that the company deliberately chooses "best-of-breed" solutions for different parts of its business. The trick, she says, lies in ensuring that the various systems and software tools work smoothly with one another.

The company's software ecosystem is also highly dynamic. Infineon tries to upgrade its systems regularly as new functions become available, working closely with its providers to develop roadmaps for future developments. In the past, it has also developed some software in-house where specific capabilities were not available on the market, but Desmicht says that wherever possible Infineon now tries to standardize its systems and work with off-the-shelf solutions.

That policy of continual upgrades has allowed Infineon to implement innovative approaches as they become available. Its current planning tools incorporate machine learning capabilities, for example. They are used to set inventory targets automatically for clusters of components with similar demand characteristics, and to generate demand forecasts that are shared with logistics providers and other supply chain partners.

Right now, the company is involved in a project to add an entirely new layer to its supply chain

management architecture. "We recognized that there is a growing need to have not just backward-looking traceability, but also a real-time view of our manufacturing and supply networks," explains Desmicht. "We want a view that is not as deep as a manufacturing execution system, but not as shallow as a conventional enterprise resource planning system." The new system, which Infineon calls its Global Production Network, will, says Desmicht, "bring us to the next level in terms of real-time supply chain capabilities."

Into hardware

Infineon is also exploring the opportunities that Industry 4.0 can offer for its supply chain. That feels like a natural step for an organization whose products operate at the boundary between the digital and physical worlds. So far, says Desmicht, the company has made most progress in its manufacturing operations, where sensors and RFID tags are helping to improve the visibility and control of materials as they flow through production.

Automation is also coming to its logistics operations. In its finished goods warehouse in Singapore, for example, conventional shelves have been replaced by an automated storage and retrieval system. The technology has had multiple benefits, says Desmicht, including improved accuracy and a boost in productivity. It has also significantly increased the capacity of the warehouse, which helped Infineon to meet a sudden increase in demand following the 2015 purchase and subsequent integration of U.S. rival International Rectifier.

People matter most

Desmicht cautions against the idea that technology is the solution to all supply chain challenges, however. "A tool is just a tool," she says. "For us, it's more important to understand the problem you want to solve. Then you can decide which approach works best to achieve your goal. You don't always have to invest in the most expensive technology when something simpler might do the job."

Technology and the wider organization also need to evolve in tandem, she adds. Infineon places great emphasis on the people side of its supply chain. It has established a dedicated academy to train supply chain personnel and runs a cross-functional supply chain community that meets regularly to discuss performance and solve problems. In a sign of the growing importance of the function, supply chain issues are increasingly on the agenda at the very top of the organization. Fifteen years ago, says Desmicht, it would have been unusual for Infineon's top management to discuss the supply chain. "Now we have no problem getting air time with the board." ■ Jonathan Ward

A CONNECTION IN THE AISLE

Automation, robotics and the internet of things are coming to a warehouse near you.

The workings of the modern factory would be awe-inspiring and bewildering to a 19th-century industrialist. The average warehouse might look reassuringly familiar. Manufacturing has been transformed by successive waves of innovation, from electrification to automation and digital technologies. Most warehouses, by contrast, appear decidedly low-tech. Goods are arrayed along aisles of racking. Picking is completed mainly by hand. And the most common machine on show is the forklift truck, a device that doesn't look so very different from the hoists and cranes that were common in the late 1800s.

It isn't a lack of inventiveness that has kept most warehouses so stubbornly simple. Automated materials handling systems have existed since the 1960s. Yet they remain the exception rather than the rule. By 2016, for example, only 10 percent of U.S. warehouses were believed to be using any form of advanced automation in their operations.

Your inflexible friend

The Achilles' heel of earlier generations of warehouse automation was a lack of flexibility. Conventional automated storage and retrieval systems operate best when demand is consistent and the items they handle are similar. The trouble is, that's not how most warehouses

work. Warehouses need to add flexibility to the supply chain, acting as a buffer between impatient, unpredictable customers and slow, inflexible production operations. In many warehouses, activity and inventory ebbs and flows through the year. And warehouses may store and handle tens of thousands of different items, each a different size and shape and each experiencing different rates of demand.

Recent trends, from globalizing supply chains to the meteoric rise of e-commerce, have ramped up the need for flexibility in warehouse operations. And so far, no technology has proved quite as flexible or cost effective as a human workforce.

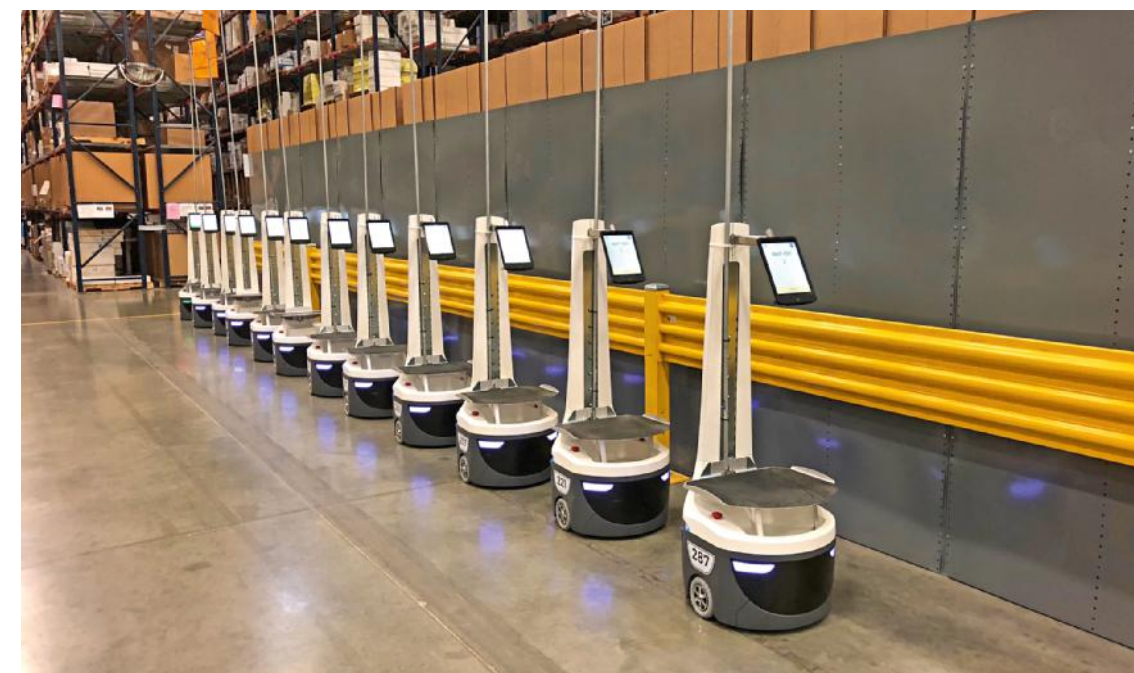
Provided, that is, you can get the people you need. "Labor shortages are becoming an increasingly serious problem in warehouses across the world," says Jan-Thido Karlshaus, Global Head, Technology Sector, DHL Supply Chain. And a lack of available personnel is especially problematic for operations that rely on temporary labor to cover short-term peaks in demand.

New partnerships

The need to find less labor-intensive ways to run warehouse operations is driving a resurgence in interest in technology, just as a range of new approaches are reaching commercial maturity. "Technology has the potential to help overcome labor-related challenges, and more

2x

The productivity improvement achieved by mixing people and robots in warehouse operations



OFF THE SHELF:
Self-guiding warehouse vehicles from Locus Robotics at DHL can load goods into plastic bins.

100

The number of manufacturing locations

1,500

The number of customer sites in 50 different countries

importantly, to help deliver efficiency savings and ultimately better solutions to our customers,” says Karlshaus.

One key attribute of the latest generations of technologies is that they don’t seek to replace human workers entirely, but to support them in new ways. “The development of cobots that can work safely alongside people allows warehouses to add automation selectively,” says Thierry Driesens, Digital Transformation Officer, DHL Supply Chain. But, while automating parts of an existing process can be a boon for tasks that are particularly strenuous or repetitive, he notes, “The real improvements emerge when you use automation to enable an entirely new process.”

LocusBots from U.S.-based Locus Robotics, for example, are self-guiding vehicles that navigate autonomously around a warehouse carrying standard plastic tote bins. A display on the bot tells nearby warehouse associates what to pick for each bin, and a scanner confirms each item as it is loaded. By allowing workers to spend more time picking and less walking the aisles, Locus says that its system can double worker productivity. And the system handles demand variability too. When the warehouse is quiet, workers follow the fleet of bots through the facility, picking from one area at a time. At busy times, workers stay in fixed zones, and the bots come to them. Locus Robotics says that another key benefit of its system is its ability to integrate with existing warehouse operations with no need to reconfigure the racking or install fixed infrastructure.

Other advances in warehouse technology rely on digital intelligence rather than robotic muscle. DHL has partnered with leading technology companies including Cisco and Nokia to install internet-of-things technology in warehouses in Germany, the Netherlands, Poland and the U.S. These facilities use a number of different

approaches, including wireless tracking technology to monitor the movement of forklift trucks and personnel through the warehouses in real time. The data collected can reveal opportunities for efficiency improvements, such as areas within the facility that suffer congestion at peak times or layouts that force associates to take circuitous routes to commonly visited areas.

Other players in the sector are ripping up the conventional rulebook entirely. U.K.-based online grocery Ocado, for example, opened a new customer fulfillment center in Andover, U.K., last year. The facility contains a three-story-high aluminum grid in which grocery items are stored in stacks of crates. A fleet of 1,100 robots moves over the grid on a 112-kilometer network of rails, lifting crates from the stack and delivering them to pick stations where employees assemble customer orders. At full speed, the center is designed to process 65,000 customer orders per week. The British company has signed agreements to supply similar technology to a number of other retailers worldwide.

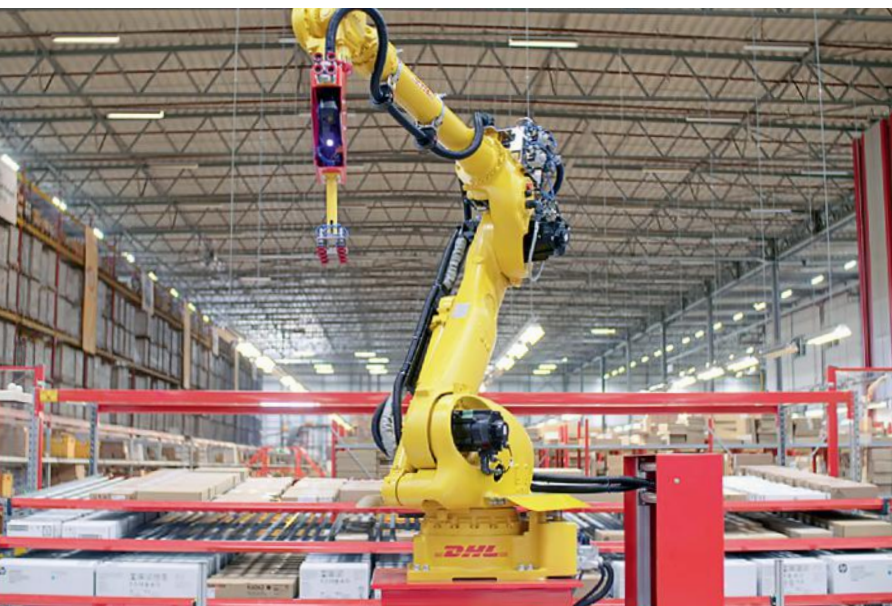
Picking up speed

If the current wave of warehouse technology is based on new collaborations between humans and machines, that doesn’t mean the dream of the fully automated warehouse is dead. Given the right conditions, the latest robot picking systems are already able to outperform human workers. DHL’s robotic picking cell in Beringe, the Netherlands, for example, uses machine vision technology to pick and stack boxes of various sizes and shapes. The system can handle up to 600 units an hour, and will operate consistently and accurately 24 hours a day.

Robots still struggle, however, when faced with chaotic or unexpected environments, such as a box containing a random selection of items of different shapes and sizes. Researchers around the world are striving to build systems that can find and pick items with the dexterity of a human being. The field took an important step forward last year when Ken Goldberg and Jeff Mahler, researchers at UC Berkeley, demonstrated the latest version of their Dex-Net system. Dex-Net is an artificial intelligence (AI) program that uses neural networks to decide how robot arms, equipped with a gripper and a suction pad, should pick up objects of arbitrary shape and size. Goldberg and Mahler say their system can pick items at a rate of 200 to 300 per hour. That’s much faster than the 95 picks managed by robots in a recent competition organized by online retailer Amazon, but still far short of the 400 to 600 that human warehouse staff achieve when faced with the same challenge.

The U.S. researchers are bullish about the prospects for the technology, predicting that robots will achieve “human or superhuman” levels of dexterity in the next five years. Even before then, it’s likely that warehouse staff will increasingly work hand-in-hand with advanced automation and AI. ■ Jonathan Ward

ARM’S REACH:
DHL’s robotic picking cell can pick and stack boxes.



BUSINESS

BETTER BY DESIGN

Circular economy models, packaging optimization and better recycling infrastructure could help societies cope with plastic packaging waste.

In 2017, e-commerce sales worldwide were \$2.3 trillion and were expected to grow to \$4.88 trillion in 2021, according to eMarketer. The boom in e-commerce seems unstoppable, as more people sign on to the convenience of home delivery and the extra variety that can be found when shopping online.

Yet the shift to e-commerce is leading to more single-use plastic waste due to packaging. This is happening even though environmental consciousness has become a common value in much of the world, evidenced in part by consumers’ willingness to pay more for sustainable products.

No organization has quantified just how much additional plastic packaging is being used due to e-commerce, or the net impact on the environment. Yet the plastic waste generated through e-commerce is one point of strong criticism from the general public, since B2C online purchases must be packaged one extra time (as compared to bulk B2B items) to protect them during

shipping. In addition, return rates for items bought online are as high as 30 percent, which implies multiple purchases of the same item. (Return rates for purchases in traditional retail stores are estimated at nine percent, according to Sourcing Journal.)

In many cases, these purchases require more packaging than bulk items headed to a store. For instance, an item may need air pillows to protect it because of additional handling.

A range of actors is stepping up to take on the problem. The European Union has set a target of 55 percent of plastics to be recycled by 2025. The U.K. has proposed a tax for packaging that does not contain recycled plastic. In India, the government of the state of Maharashtra has banned the manufacturing, use, sale, distribution and storage of a range of single-use plastic items. Companies and NGOs worldwide are making commitments and initiating actions to reduce plastic waste. Researchers are developing more sustainable packaging options, and consultants are analyzing

\$4.88
TRILLION

The forecast for e-commerce retail sales in 2021



30 PERCENT

The return rate for e-commerce sales

production and consumption process steps to understand how and where plastic waste can be eliminated or reused.

Still, solving the problem of how to reduce and manage plastic waste is a vast, complex and challenging task. It's one that companies are tackling in multiple ways – including conducting research, creating incentive programs and involving communities in finding solutions.

Consumers and logistics providers in the circular economy

Circular economy models are one promising way to tackle the problem. They are designed to keep resources within a system as long as possible, in part by reuse; these models differ from linear models that focus on making, using and disposing of products.

The Ellen MacArthur Foundation is working to see circular economy models implemented around the world. For instance, it is bringing together diverse organizations to end what it calls “systemic stalemates” that organizations cannot overcome in isolation. With regard to the plastic challenge it does this through the New Plastics Economy initiative, which is focused on re-thinking and re-designing the future of plastics, starting with packaging.

Still, there's much more to do, especially to educate consumers, who are the ones who are essential to close the circular economy loop but may not know how to do it.

Designing waste out of the system

One idea is to get logistics providers to pick up packaging from end consumers for reuse, recycling or sale. This is what Dhruv Boruah, a U.K.-based plastic waste consultant and campaigner, would like to see put into action. Boruah is on a mission to educate consum-

ers about plastic waste and help companies find new business models for managing it. In 2015, as he was competing in an ocean race, he observed plastic waste floating by on his way from the U.K. to Brazil; back on land, he took it upon himself to get the word out through the media, activism and consulting.

Boruah says the logistics industry can create metrics to help end consumers better understand the total environmental cost of transporting their purchases and incentives for them to receive consolidated items in bulk. Logistics companies could also design reverse logistics processes for returning reusable packaging to fulfillment centers, or they could help create secondary markets for waste. “Packaging waste can be sold as secondary raw materials to other businesses. Companies can create a mini marketplace as a case study to showcase this ‘waste to resource’ approach and demonstrate reclaimed revenues. By designing waste out of the system, they will get one step closer to achieving a circular economy,” Boruah says.

The reverse logistics processes that Boruah describes require significant investment because multiple delivery systems have to be coordinated, and those systems must be transparent for consumers and vendors. One industry has made some progress. According to the American Institute for Packaging and the Environment, the meal kit industry is a frontrunner in establishing collection and take-back programs for packaging waste. The industry, which supplies recipes and cooled ingredients in precise quantities for making meals, had been criticized for the voluminous packaging required to ship preplanned meals directly to homes.

David Foster, Director of Packaging Development at Adept Packaging in the U.S., a company that engineers packaging and consults on packaging, puts more onus

on companies and the public sector for closing the loop on circular models than on individuals. “The correct infrastructure must be in place to allow consumers to channel waste to where it needs to go. I don't feel that this is so much about consumer education. It's more about investment in systems to allow consumers to complete the circular economy,” Foster says.

Of course, recycling infrastructure varies widely from country to country. In Germany, sorting and recycling household trash is ingrained in the culture, and different channels exist for disposing of household, organic and packaging waste. According to OECD data from 2013, some 65 percent of municipal waste treated in Germany is recycled or composted. In Turkey and Chile, that number is one percent.

Technology and packaging

Retailers and brands are looking to new technologies, as well as materials and designs, to make packaging more sustainable. This may include biobased and/or biodegradable packaging, or packaging that is edible, for instance inside meal kits. Here as well, the landscape is complex, and moving to alternative materials does not necessarily address the problem, because alternatives come with their own risks. For instance, oxodegradable plastics are sold to consumers based on the idea that they will biodegrade, but the European Commission says that's not necessarily the case and is banning them. The vast majority of biodegradable materials do not degrade quickly, or in many cases at all, in the open-air environment, and hence do need collecting. Labelling something as biodegradable may encourage littering since consumers will think it just ‘melts away.’ Other ideas include making packaging lighter (sometimes called lightweighting), or so-called right-sizing, which means making sure transport boxes are suitable sizes for their contents.

Even as companies explore new materials and designs, the packaging and unboxing experience may be becoming more important as part of the product experience as unboxing videos gain popularity on social media. A brand may be known for its aesthetic or artistic packaging, or it might try to appeal to customers or cultures that place particular value on the way a product is presented.

Some responses offered for maintaining the packaging experience while cutting back on waste include more personalized packaging for products sold via e-commerce, which traditional retail cannot offer, or providing an augmented reality experience that can be accessed online after a consumer scans a QR code.

No easy solution

Within the supply chain, stakeholders are working on ways for plastic waste to be mitigated as well, such as improved processes or technology applications. Foster sees potential in connected packaging that will make it



GOOD SORTS:
Packaging waste is sifted at a recycling center.

easier for companies to track and trace items and have better control over their supply chains, possibly opening up new business ideas or new processes for reusing and recycling materials. And advanced analytics can help shippers and logistics companies identify those shipments that could be combined to reduce packaging waste and emissions.

Maurin Broil, Senior Expert Business Development, Corporate Shared Value, DPDHL, says the company is working with customers, policymakers, citizens and other stakeholders to identify circular economy models and pilot various ways to reduce waste, including plastic waste. For example, tests have been conducted in Germany, China and the U.K. involving reusable straps with hooks to hold goods on a pallet instead of single-use plastic stretch wrap.

Broil says he recognizes how difficult it is to reduce plastic packaging in the entire production-consumption cycle. “There's no easy solution, no one-size-fits-all answer. You can't say let's just move from traditional plastic to biodegradable plastic. Unfortunately, it's not that simple,” he says, adding: “Everyone agrees that there's a problem, but it's still unclear what the solutions are. What we are doing is working toward solutions and testing them in the market.”

But even that is not so easy, says Ken Allen, CEO of DHL eCommerce Solutions. “It's a complex task. There's a great variety of demands from various stakeholders in the process, and there's no recycling standardization. However, easy or not, protecting our environment and the world's oceans is something that needs smart solutions. Therefore, private industry needs to step up and work hand in hand with governments and other organizations to help tackle the problem. At DHL we engage closely with our customers, and we are committed to playing our part in finding solutions that work.” ■ *Rhea Wessel*



WRAPPED UP:
Higher online sales are generating more plastic waste.

Photos: Adobe Stock / iStockphoto/Getty Images; Everling Standard/InterTopics/eyevine/ddp

THE UPS AND DOWNS OF BELT AND ROAD

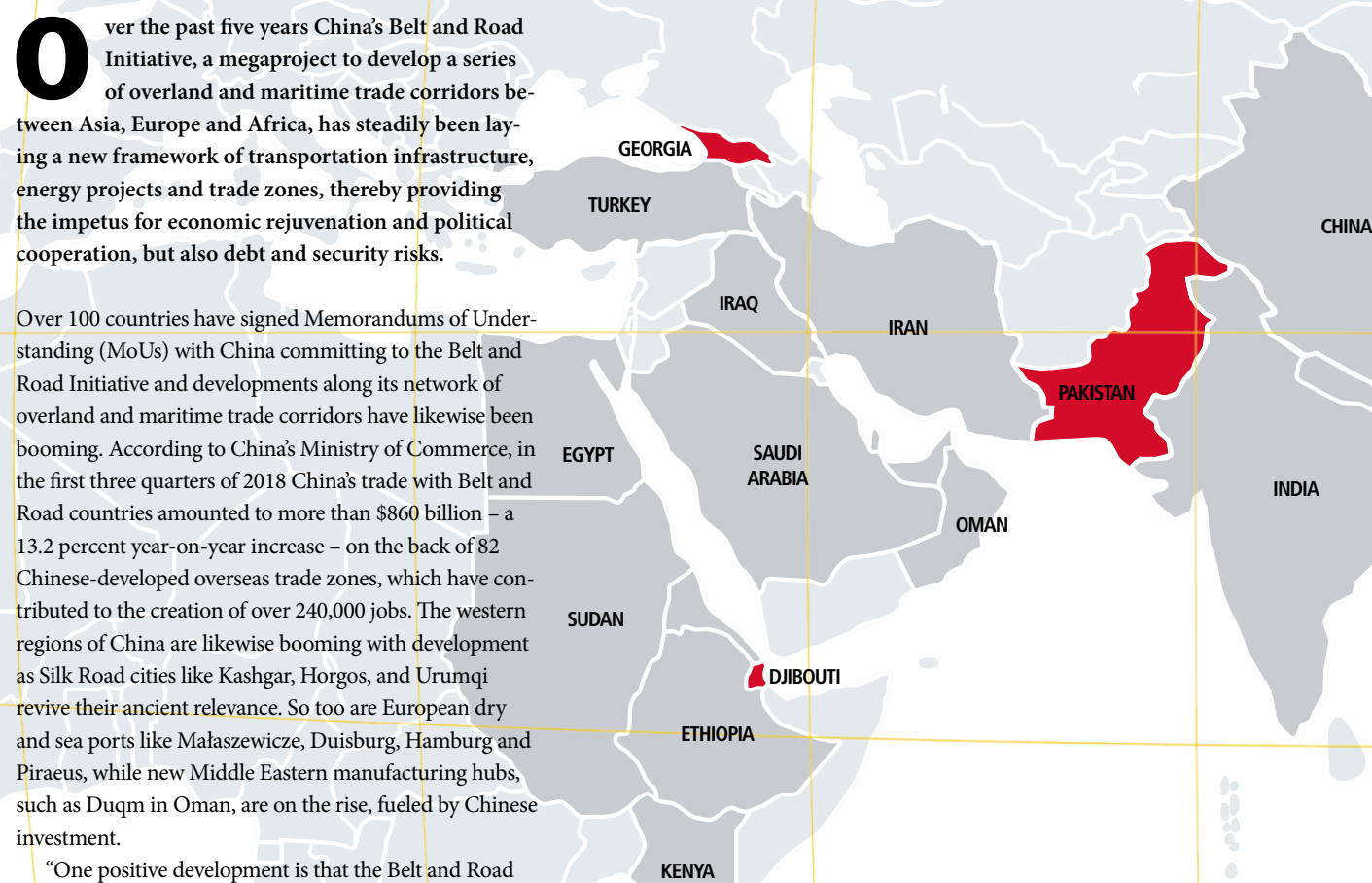
At its five-year point, China's Belt and Road has made major strides at interconnecting Asia, Europe and Africa, opening up previously off-the-radar markets to global trade and infrastructure investment. However, such great rewards are not without their risks.

Over the past five years China's Belt and Road Initiative, a megaproject to develop a series of overland and maritime trade corridors between Asia, Europe and Africa, has steadily been laying a new framework of transportation infrastructure, energy projects and trade zones, thereby providing the impetus for economic rejuvenation and political cooperation, but also debt and security risks.

Over 100 countries have signed Memorandums of Understanding (MoUs) with China committing to the Belt and Road Initiative and developments along its network of overland and maritime trade corridors have likewise been booming. According to China's Ministry of Commerce, in the first three quarters of 2018 China's trade with Belt and Road countries amounted to more than \$860 billion – a 13.2 percent year-on-year increase – on the back of 82 Chinese-developed overseas trade zones, which have contributed to the creation of over 240,000 jobs. The western regions of China are likewise booming with development as Silk Road cities like Kashgar, Horgos, and Urumqi revive their ancient relevance. So too are European dry and sea ports like Małaszewicze, Duisburg, Hamburg and Piraeus, while new Middle Eastern manufacturing hubs, such as Duqm in Oman, are on the rise, fueled by Chinese investment.

“One positive development is that the Belt and Road has drawn attention to the global demand for infrastructure,” says Jonathan Hillman from the Center for Strategic and International Studies, a Washington-based think tank. “More countries are now realizing that infrastructure, often viewed narrowly as a technical and domestic issue, carries wider-ranging economic and strategic implications.”

However, the rewards of the Belt and Road haven't been without risks, as the initiative has welcomed in many previously war-torn, economically tumultuous and politically transitioning countries that are attempting to evolve from conflict-infused backwaters to new epicenters of global trade. The following takes a look at Pakistan, Djibouti and Georgia – three countries that have planted the seeds of economic potential beneath an opaque miasma of economic and political challenges. ■



DJIBOUTI

Even before the Belt and Road was formally announced in 2013, China was already making big infrastructure investments in Djibouti, a country strategically located in East Africa at the entrance to the Red Sea – one of the world's busiest shipping lanes that also serves as the primary gateway to Ethiopia and the interior of northeastern Africa.

Along with its strategic location, Djibouti has also become attractive as a Belt and Road hub due to its relative stability in a region that has not recently been known for such. “There is a big mess around the coun-



Photos: Adobe Stock; Yasuyoshi Chiba/AFP/Getty Images

try,” Thierry Marill, Chairman of DHL partner Marill Group, says of Djibouti. “If you look around, you have the pirates at sea, you have the Al-Shabaab [militant group] in Somalia, you have the Yemeni war, you have the Eritrean conflict. So Djibouti is surrounded by many war zones, but Djibouti is quite a stable place.”

The Port of Djibouti provides a substantial portion of Djibouti's overall GNP, bringing in nearly \$2 billion in port fees from Ethiopia alone. With 100 million people, Ethiopia is the most populous landlocked country in the world, and while air cargo is on the rise there, the Port of Djibouti is still the country's economic lifeline, handling upward of 95 percent of its foreign trade.

“The companies are looking for roads and connections, so once a port is connected to the hinterland then some major companies might be interested in investing in Djibouti. Without roads and without means of communication it's useless,” Marill explains.

To this end, China has been making substantial investments in Djibouti's transportation sector via the Belt and Road. The \$590 million, 690-hectare Doraleh Multi-Purpose Port – a section of the Port of Djibouti – went into operation last year and is envisioned to become the quintessential Belt and Road transportation hub, connecting East Africa with Asia and Europe. The

project has the capacity to handle two million metric tons of bulk cargo and 220,000 TEU a year. In addition to this, a China-funded manufacturing/export zone near the port that aims to employ 10,000 people is also in development. A new \$599 million airport, built with the help of Chinese money and construction companies and expected to have the capacity to handle 100,000 metric tons of cargo and 1.5 million passengers per year, is currently in the works as well.

However, the biggest Chinese investment in Djibouti's transportation sector is the \$4.5 billion Addis Ababa-Djibouti Railway, which went into operation in early 2018. This railway currently has the capacity for five to ten 100-TEU trains daily; they go from Ethiopia's capital city to Djibouti Port, traversing the 750 kilometers in 12 hours – a six-fold improvement in lead times.

However, Marill points out that China has acted less as a “no-strings-attached” investor in Djibouti and more as a lender, providing much-needed funding for infrastructure development that is to be repaid with interest at a future date. In the past two years alone, Djibouti has received \$1.4 billion – 75 percent of its GDP – in loans from China, and some analysts have warned that the country may soon find itself in a “debt trap.” ■

DJIBOUTI

Population: 884,017 (July 2018 est.)

GDP: \$2.029 billion (2017 est.)

World Economic Forum's
Global Competitiveness Report: –

World Bank Group's Ease of Doing
Business Index 2019: 99th out of 190

DHL Global Connectedness
Index 2018: –





PAKISTAN

Unlike many other Belt and Road countries that boast a scattered array of Chinese-invested development projects, China and Pakistan upped the ante and began building an entirely new nationwide infrastructure megaproject known as the China-Pakistan Economic Corridor (CPEC). It is projected to become a \$62 billion network of interconnected transportation and energy projects, spanning 2,700 kilometers down the spine of Pakistan – from Kashgar in western China to Gwadar Port on the Arabian Sea.

PAKISTAN

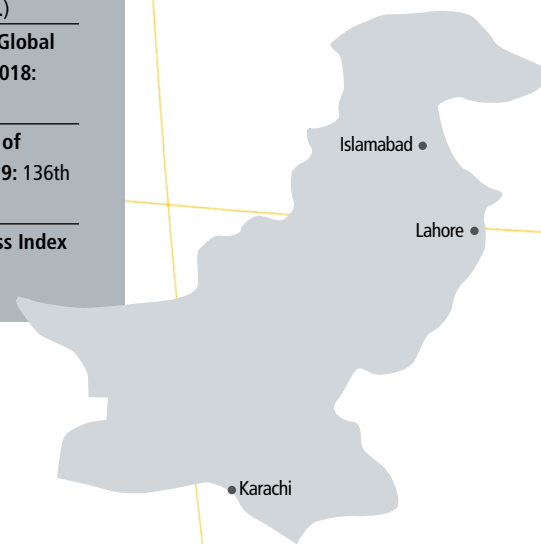
Population: 207,862,518
(July 2018 est.)

GDP: \$305 billion (2017 est.)

World Economic Forum's Global Competitiveness Report 2018:
107th out of 140

World Bank Group's Ease of Doing Business Index 2019: 136th out of 190

DHL Global Connectedness Index 2018: 127th out of 169



“With an invaluable talent pool, vast land mass and progressive and forward-looking population, Pakistan is well placed to bring about an economic revolution,” says Umair Alam, Country Manager, DHL Global Forwarding Pakistan. “[Pakistan’s] business will benefit immensely from our association with China, the world’s largest exporter of goods and an economy that maintains strong growth potential.”

Gwadar Port is the biggest CPEC project to date, linking together an overland corridor and the maritime route of the Belt and Road. With over \$1 billion worth of projects online today, the port is expected to spark a broader conurbation of development – a “megaport city” – with an array of residential, commercial and industrial projects led by the China Overseas Port Holding Company’s 2,282-acre free trade area.

The CPEC is also attempting to alleviate two of Pakistan’s major economic and social bottlenecks: inadequate transport infrastructure and deficient energy capacity. Traffic congestion is estimated to shave 3.55 percent off of Pakistan’s annual GDP, while a lack of energy capacity is responsible for a loss of around 2.5 percent. The CPEC will provide an entirely revitalized transportation grid spanning the country, including a 1,100-kilometer highway between Karachi and Lahore and the rebuilding of the Karakoram Highway, along with more than \$33 billion worth of new energy projects. It is also laying a new network of oil and gas pipelines to transport fuel from Iran and Gwadar Port to China.

According to Muhammad Ali Hussain, Chief Marketing Officer for Gwadar Port, the emergence of the CPEC has led to other countries besides China showing interest in investing in Pakistan, including Germany, Australia and Saudi Arabia, which is planning to develop a \$3 billion, 80,000-acre “oil city” in Gwadar.

However, the CPEC has not come without an array of challenges and risks. Inherently, it is a heavily debt-dependent endeavor: It contributed to Pakistan’s external debt rising to \$95 billion in the second quarter of 2018 – a nearly \$30 billion increase in three years – and some analysts have expressed the same “debt trap” fears that they apply to many other active Belt and Road countries. Development of the CPEC has also stoked domestic and international political tensions, as the northeastern part of the corridor breaches contested territory that India claims as its own. And in Balochistan, the location of Gwadar Port, separatist groups have been violently resisting Chinese-directed development projects, culminating in the bombing of the Chinese embassy in Karachi last November.

But Pakistan hopes that the infrastructural leg up that the CPEC could potentially provide will increase the country’s economic outlook in the future, and there have been some early glimmers of hope: Pakistan’s economy is growing by 5.2 percent a year, with \$14.7 billion in foreign reserves and a stock market that recently began hitting all-time highs. ■

GEORGIA

Nestled in the heart of the Southern Caucasus, with Turkey to the west and Central Asia to the east, Georgia is a natural land bridge between the two sides of Eurasia: a gateway between the booming economies of Europe and China. This is a position that the country’s government is attempting to double down on as it engages in large-scale infrastructure development as well as favorable trade deals with a host of nations and economic blocs around the world.

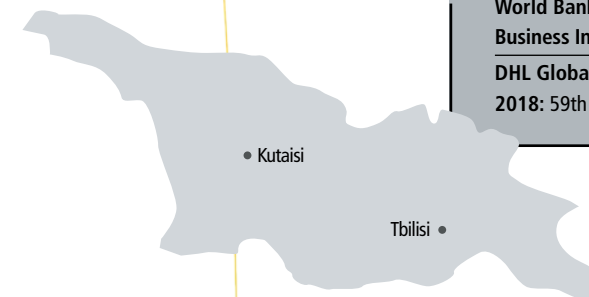
“There is no country in the region that is more open to Chinese business and investment, Chinese people and culture or Chinese innovation and ideas than Georgia,” Georgia’s former prime minister Irakli Garibashvili said in a 2015 speech at Beijing University. This sentiment succinctly sums up Georgia’s position on China and the country’s aspirations to reimagine itself as a hub along the Belt and Road.

China was one of the first countries in the world to recognize Georgia’s independence, establishing relations in 1992. This nod was apparently not forgotten, as Georgia has become one of the biggest proponents of the Belt and Road Initiative, even going so far as to host their own Belt and Road conferences in 2015 and 2017 – the first to happen outside of China.

Trade between the two countries has risen from being nominal at the beginning of the 21st century to relatively significant. China is now one of Georgia’s largest trading partners, with imports/exports between the two countries worth \$751 million in 2016. FDI from China is also significant, totaling \$200 million in 2014, making China Georgia’s biggest foreign investor.

Beyond its favorable geographic position, Georgia has become an attractive option for foreign manufacturers due to the country’s array of international trade agreements. Georgia has a Deep and Comprehensive Free Trade Agreement with the EU, which allows Georgia-made goods to be exported to the bloc duty free. It also has preferential trade agreements with the U.S., Norway, Switzerland, Canada and Japan, along with free trade agreements with Turkey, Russia, Azerbaijan, Armenia, Ukraine and most of the Central Asian states. In May of 2017 China and Georgia signed a much-anticipated free trade agreement that will wipe out over 90 percent of trade tariffs between the countries.

Georgia has set up the bureaucratic framework to become an industrial epicenter at the heart of the Belt and Road, and it now needs to build up its infrastructure to a level to make good on this progress. One of the main projects working toward this goal is the



GEORGIA

Population: 4,926,087
(July 2018 est.)

GDP: \$15.16 billion (2017 est.)

World Economic Forum's Global Competitiveness Report 2018:
66th out of 140

World Bank Group's Ease of Doing Business Index 2019: 6th out of 190

DHL Global Connectedness Index 2018: 59th out of 169

Baku-Tbilisi-Kars (BTK) Railway, which links the new Azerbaijani port at Alat with Eastern Turkey via Georgia and went into service at the end of 2017. The 849-kilometer long rail line was the proverbial missing link in the Middle Corridor of the Belt and Road, which extends from China to Europe via the Caspian Sea – while bypassing Russia and their sanctions against the import or transport of many European goods. The BTK Railway has capacity for 1 million passengers and 6.5 million metric tons of cargo per year, and provides a much-needed diversity of options for shipping products overland between Europe and Asia in just 15 days.

Other new infrastructure projects of note are the Anaklia Deep Sea Port on the Black Sea, which will be able to handle the sea’s largest vessels and 100 million metric tons of cargo per year, a new residential/commercial development called Tbilisi Sea New City that’s being built by the private Chinese firm Hualing, as well as a free industrial zone in Kutaisi. An MoU between China and Georgia was also signed at Georgia’s Belt and Road conference in 2017 to construct a new free economic zone. ■

Risks and rewards

The idea of “getting in first” has been central to China’s domestic development strategy – which has seen companies boldly moving into new frontiers throughout central and western China since the early 2000s – and the same ethic has been applied internationally with the Belt and Road. However, when opening up new markets to global development and trade, the promise of big rewards always comes hand in hand with inherent risks.

■ *Wade Shepard*

A VISION FOR EUROPE

Prosperity, stability, open borders, a single market for at least 27 countries, and a single currency for more than 300 million people: What few would have dared to dream of 70 years ago has become a reality in Europe. The trouble is, we have become so used to this reality that it fails to generate much enthusiasm these days. In fact, Europe is fracturing as populist movements threaten to undermine the very foundation of the postwar continent's economic and political progress.

Critically, Europe risks losing its clout at a time when it needs to be stronger than ever before. Long-standing alliances and established rules of engagement are increasingly vulnerable. To play an influential role in the world, Europe must speak with one voice on critical issues such as climate change, promoting open markets, or institutional reform at the World Trade Organization or the United Nations. The isolationist path that European populists are charting would be the fastest route to irrelevance.

2019: a defining year for Europe

2019 will be a defining year for Europe, with Brexit, European elections and a new EU Commission. In such a year, what we need more than anything is a clear and positive vision for Europe's future – a vision that can help curb populism and contain the centrifugal forces it threatens to unleash. I believe that Europe's core challenge today is that it fundamentally lacks orientation: Many people don't know what the continent really stands for anymore, and what role it wants to play in the future.

Yet paradoxically, we have everything we need to fill this perceived void. We only have to look around us to see the key building blocks that can help us chart a promising path for the future of Europe – a path that is compelling enough to replace the prevailing sense of uncertainty with a sense of opportunity.

Digital transformation: opportunity abounds

I believe digital transformation plays a key role here as a powerful driver of our future prosperity. Digitalization leads to increased productivity across the economy, and thus to lower prices, higher real incomes and higher standards of living. It enables

us to produce better products and services with fewer resources, and it reduces the need for physically demanding work.

Europe needs to be at the forefront of the digital transformation. This is, admittedly, ambitious. Europe still has deficits in key areas, such as high-speed broadband connectivity, and sometimes remains hampered by a “fear of failure” mentality that prevents us from experimenting with new ideas. But we also have a lot that we can build on: a history of pioneering innovations, a strong R&D track record, a highly qualified workforce and world-class engineering skills concentrated in many companies that lead in their respective fields.

Education: Europe's “silver bullet”

If there is one “silver bullet” to advance a powerful digital economy and make Europe more future-proof, it's high-quality education. Education enables continued innovation and helps people keep up with a changing world.

While Europe already has a high level of education, I believe we are not sufficiently prepared for the impact of the digital transformation and intensifying global competition. We have to mobilize far more resources to create state-of-the-art education systems, and focus more on reskilling and upskilling. The ultimate goal should be to provide more people in more stages of life with affordable, modular and tailored access to world-class learning opportunities. Of course, education is never a quick fix: Any real-life effect it can have is often decades away. But that delay between “sowing”

and “harvesting” is no reason for not embarking on that road. Any year we wait is crucial time lost.

Open for business

A more forward-looking approach to digitalization and education would also go a long way to making Europe a more dynamic business location. But there is more that can be done here. For example, we would be well advised to invest significantly into modernizing and building the physical infrastructure that will keep us moving in the future.

We also need smarter regulation to facilitate entrepreneurship and the diffusion of new technologies. Other countries have created thriving special economic areas – why not create special experimental zones for technological innovation in Europe? For example, road stretches or dedicated parts of cities where autonomous driving or flying drones is encouraged. Likewise, we can do more to stimulate a thriving European venture capital scene, which would help to finance some of the top players of the future.

Europe's agenda for a changing world

European institutions are not perfect. But the only realistic option is to work on our existing European architecture – not abandon it in favor of more national solutions. Today, we need a united, outward-looking Europe more than ever to make our voice heard. Europeans should appreciate the value of cooperation and the pooling of strengths. Our continent is the most interconnected region on the planet, with eight out of the 10 most globalized countries, according to the DHL Global Connectedness Index 2018. More than any other region, Europe is testament to the opportunities arising from cross-border integration. This should spur us on to staunchly defend the very essence of an open Europe and promote a more interconnected world.

Keeping our identity as an open, outward-looking Europe also means retaining our fundamental openness to people from other global regions. With their diverse talents and skills, migrants from all over the world can greatly enrich our cultures and economies, as they have done in the past. If we fully integrate them and tap their potential, we will also be better equipped to cope with demographic changes leading to an aging and shrinking workforce as well as talent gaps. As many migrants bring knowledge of outside markets, they can also help strengthen Europe's global business ties.

Today's young generation of Europeans can – and will – play a key role in our efforts to defend and strengthen our core European values while reaching out to the world. They embody the “European way of life” by working, studying and traveling freely across Europe in pursuit of the best opportunities. Their openness, their expectations and their demands can make a big difference and set free enormous potential for positive change. We have to do more to fully tap into this potential and to get young Europeans to make their voices heard on the political stage.

Europe today is one of the best places in the world to live, work and do business. But it needs a new push forward. Charting the right course will require the courage for change and readiness to take the right steps – toward a Europe that is digitally ahead, leads the way in education and offers the best possible entrepreneurial environment. The stakes are high. That is why companies such as Deutsche Post DHL Group have the responsibility to be part of the discussion and take a stand. Now is the time to preserve what we have achieved in the past, to maintain our openness and to build a confident, vigorous Europe in a changing world. ■ *Frank Appel*



DR. FRANK APPEL
CEO, Deutsche Post
DHL Group

Photos: ziggy/maj/Getty Images; DHL



GOING LOCAL

For the ultimate in supply chain flexibility, the factory comes to you.

You are an ambitious entrepreneur with a killer idea for a small electronic device that could save your customers millions of euros a year. Impressed by your pitch, a major global company has just placed an order for 1,000 units. There's only one catch: Your client wants to roll out the project in three months, but hasn't quite nailed down a specification that will be compatible with its existing equipment.

Meeting that deadline looks like an impossible task. On previous projects, you've outsourced production to a

contract manufacturer in Asia. They are fast and flexible, but the turnaround time for a brand-new product is still a few weeks. With the inevitable tweaks and design refinements, there's no way you can get the units you need in the time required.

Undaunted, you make a call. Twelve hours later, a truck drops a standard shipping container at your customer's premises. Inside, there's a complete electronics production line, capable of manufacturing printed circuit boards, populating them with components, and assembling and testing the finished product. You

download the build instructions wirelessly, and prototype units are in the customer's hands before the end of the day. Within a month, the mobile production facility is turning out the final design as fast as your customer can install it.

The complete package

You can't yet order up a factory like a pizza, but that's the vision of Finnish telecoms company Nokia and a consortium of partners including DHL. The "Conscious Factory in a Box" is a working proof of concept built at Nokia's Digital Creativity Lab in Munich. The unit, installed in a standard shipping container, includes all the equipment necessary to manufacture an electronic device. Over the last 12 months, it has traveled around Europe, demonstrating its capabilities at trade fairs and customer events.

Beyond rapid new product introduction, Nokia sees a number of potential use cases for its factory-in-a-box concept. It could help established manufacturers to rapidly restart production after a disruptive event such as a fire or natural disaster. Or it could allow manufacturers to meet country-of-origin requirements, shifting their production footprint temporarily and producing sufficient volume to meet local market requirements.

"These factories are perfectly suited to meet regional and innovation startup requirements, and can be as large as needed to meet build requirements by simply adding additional containers to the location," says Grant Marshall, head of Supply Network and Engineering at Nokia Operations. "This is a new business model Nokia would like to offer to its customers."

Innovations in the pipeline

The idea of modular, mobile manufacturing isn't limited to the electronics sector. The U.K. Smart Manufacturing Accelerator, a government-funded research group, has worked with manufacturer Dearman to create a prototype factory in a box for the production of tubing assemblies for truck-mounted refrigeration systems. The containerized unit includes robots and automated equipment that can cut pipes to length, bend them and braze them together. Finished assemblies undergo automated inspection and pressure testing prior to release.

The factory-in-a-box concept makes sense for this application, say the system's sponsors, because their large size means complete pipe assemblies are expensive and difficult to transport. They envisage the system being used to aid the rollout of refrigerated transport in Africa and other emerging regions where a lack of such facilities leads to high levels of waste and prevents farmers from accessing important markets for fresh produce.

In life sciences, GE Healthcare has developed a mobile biopharmaceutical manufacturing facility designed for the production of viral vector-based therapies. This

rapidly expanding approach uses genetically modified viruses to deliver genetic material to patients' cells. The viruses are grown in special tanks before being refined and processed ready for use by patients.

GE's biopharmaceutical factory in a box is based on the company's KUBio platform, a scalable system of single-use processing equipment designed to meet strict industry requirements for quality control and biosecurity. The company says that its modular, mobile approach will be a boon for customers conducting late-stage clinical trials and for the production of targeted therapies aimed at relatively small patient populations.

Thinking outside the box

In reality, most factories won't be hitting the road any time soon. The real significance of these factory-in-a-box concepts is what they say about the broader future of manufacturing. The development of highly flexible, highly capable and highly automated equipment is shifting the economics of production in important ways. By reducing the need for dedicated tooling and costly infrastructure, these approaches erode the economies of scale that have driven the development of many manufacturing sectors. They have implications for skills too. Automation, cloud computing and reliable wireless networks make it possible for manufacturers to coordinate production remotely, and reduce the requirement for specialist expertise on site. Together, those changes could allow companies to design their production networks around the needs of their end customer rather than the limitations of their manufacturing capabilities. ■ Jonathan Ward

 bit.ly/nokia-factory-in-a-box


BOXING CLEVER:

Nokia's factory in a box includes equipment needed to build electronic devices.



SEOUL FOOD

Veidnes, a remote coastal village in northern Norway, was slowly disappearing. With no work or opportunities, residents were picking up and moving elsewhere – until one innovative shipping solution brought the fishing industry back to life. The village had a huge resource of king crabs, but two obstacles: The market was over 4,000 miles away in Seoul, South Korea, and they needed to make it there fast in order to maintain their freshness and value. Svein “Svenne” Lyder, who runs fishing operation Lyder Fisk, took on this challenge with help from DHL Global Forwarding. Using a Boeing 747-400 cargo plane, the live crabs are taken from their home all the way around the world to South East Asia, where they are sold for an average of \$11 per pound. Thanks to DHL’s extensive network, this can be done within only 20 hours. Now, the industry is saved and Veidnes’ community is restored. ■

 bit.ly/dhl-king-crab

4,000
MILES

The journey from Oslo to Seoul

20
HOURS

The time it takes DHL to deliver the crabs from Norway to South Korea

17-20
POUNDS

The average weight of an adult king crab

9
INCHES

The average length of an adult king crab

DEEP IMPACT

Want to stop feeling constantly stressed out and harassed at work? The way to clear your head and your in-tray is to take a step back – and think deep.

In today's connected world, productivity's biggest enemy is cognitive overload, costing businesses millions of dollars a year. And this is as much a problem in the boardroom as in the mailroom. A Harvard Business School study found that the "average CEO spends one in three hours on activities that were not planned in advance." This totals 13 hours per week in unplanned activities, or more than an entire day at work.

Such spontaneity has nothing to do with poor time management or scheduling skills. It simply reflects the number of situations that arise in the day-to-day running of a business that high-ranking executives have to deal with immediately.

Or do they? Some leaders don't even realize that there is a better way than spending their days in a blur of email, rushing from meeting to meeting, says Cal Newport. The author of "Deep Work," who is associate professor of computer science at Georgetown University, says that if instead we train ourselves to focus without distraction on a cognitively demanding task, we could quickly master complicated information and produce better results in less time. He insists that "deep work" will "make you better at what you do and provide the sense of true fulfillment that comes from craftsmanship."

According to Newport, there are several ways to implement deep work, from removing distractions completely to setting a habit-forming time each day for a couple of hours' deep concentration. Whichever route we choose though, deep work will only be effective if we have structure or rituals – putting ourselves in an exotic location to focus on a writing project, say, or locking ourselves in a hotel room until we finish a task – and if we constantly review our progress.

Bill Gates, who practiced deep working techniques when he was CEO of Microsoft, tended to work early in the morning and late at night when the office was quiet. He also set aside one week a year as his "Think Week." During that time he isolated himself in a remote cottage to research, read, and strategize – the ultimate deep work session.

That's a practice that has been adopted by many other top executives, such as Michael Karnjanaprakorn, CEO of online learning platform Skillshare, who takes

two think weeks a year to actively disconnect from his regular routine.

Other business leaders have structured their entire working week according to deep work principles. Tom Karwatka, CEO of software house Divante, explains on his company website that he recently moved all status reports to Mondays and all his meetings to Friday, clearing Tuesday to Thursdays for deep work. During these days he focuses on work, tries not to check his email and has reduced communications with his staff.

"I have been able to move on with many projects thanks to this approach," writes Karwatka, who credits deep work for revitalizing him and helping him rediscover the fun in his job. There are unforeseen benefits too. "I think that this is also helping my people to work better," he says, "without being disrupted by my emails all day." This company-wide focus appears to be working, with the company growing more than 30 percent year-on-year in 2018.

Newport further asserts that if CEOs and senior executives want to see a genuine improvement to their focus levels, then how they spend their downtime also matters. Insights or solutions can often come from our subconscious. That is why we all need to properly switch off during our downtime, he advises. Boredom should be embraced too: Checking our smartphone in a cinema queue sends us once more hurtling toward cognitive overload. Or, as Newport puts it: "Once you're wired for a distraction, you crave it."

Going cold turkey

But is everybody's wiring equally up to the task of deep work? According to Gloria Mark, professor of informatics at the University of California, there are big differences between people when it comes to concentration levels. "We found that around 50 percent of people have the ability to dip in and out of social media and the like at their desks and their productivity will not suffer," she says. "That is not the case for the other 50 percent."

Mark says this personality trait cuts across work and out-of-office behavior. "Those with poor self-control can learn techniques to focus better or they use technological support to help manage distractions or to let them know how they spend their time." She points to the slew of website and app blocking software such as Cold Turkey Blocker or FocusMe, which promises

to enable people to work 25 percent more efficiently by avoiding multitasking, as well as helping them quit addictive online activities such as games and gambling.

While there is undoubtedly a demand for such products, several companies – from giants like Google and Zappos to startups such as Zumba and Box – have taken a different approach by introducing courses devised in-house to help sharpen attention skills.

Over the past decade, Google has put almost 2,000 employees through a mindfulness-based emotional intelligence course called "Search Inside Yourself," devised by Chade-Meng Tan – widely known as "Meng" – a former software engineer at the company. Employees practice focus exercises and learn meditation techniques to clear their heads of office distractions. Meng later expanded the course into a bestselling book and co-founded the Search Inside Yourself Leadership Institute.

Training spotting

However, it is not just Silicon Valley's nonconformists that have embraced this approach toward tackling cognitive overload. Software giant SAP's in-house training courses emphasize "attention training," while other German companies have introduced a wide array of measures to improve focus and productivity. Both Volkswagen and Deutsche Telekom, for example, limit after-hours and weekend email use.

Newport professes to ignore his own email inbox for up to three days at a time. He further boosts his productivity by moving all related messages to temporary folders before reading them – a technique, he says, which makes projects much easier to tackle.

As Newport puts it in his blog: "It certainly does help me maintain my sanity when I have to return to the world of workplace communication after travel or long deep work binges." ■ *Boyd Farrow*

5.6 HOURS

The average daily time spent checking email – up almost half an hour since 2017

2,617

The number of times a typical smartphone user touches their phone every day



Illustration: Danae Diaz for Delivered.

DELIVERED. SCRUMS DOWN WITH...

SIR JOHN KIRWAN

The legendary former All Blacks star talks about his life as a top rugby player and coach – and which lessons learned on the pitch could be successfully applied in the boardroom.

When John Kirwan was a small boy, he'd think about rugby all the time. And when he wasn't thinking about it, he was playing it. It's hardly surprising: The sport is in his blood. His father and grandfather were top players, and his uncle Teddy was an All Black trialist. "I probably learned to say the words 'All Blacks' before I learnt to say 'mum and dad,'" laughs Kirwan (now Sir John Kirwan). "As a kid, I slept every night clutching a rugby ball."

But he wasn't just an obsessive fan of rugby, he was also incredibly good at it, blessed with the skill that would ultimately propel him into the professional game's upper echelons. After making a name for himself as a winger at club level, he made his international debut at the age of 19. His agility and finishing ability were immediately apparent. "I had size and speed," he admits, "although I was never out and out fast. What I worked on was getting close enough to my opposition to leave them on the ground."

It was a strategy that worked wonders, allowing him to score 35 tries in 63 internationals, the New Zealand record at the time. He was top scorer at the inaugural Rugby World Cup tournament in 1987, helping the All Blacks lift the famous Webb Ellis Cup trophy for the first time. He would later play for Italian team Benetton Rugby Treviso and Japanese Top League team NEC Green Rockets before turning to coaching, first for the Italian national side and then the Japanese team.

From the stands his life looked glorious, but Kirwan has since written two books about his battles with depression, "All Blacks Don't Cry" and "Stand By Me." After doing so much to raise awareness, he was knighted for his services to mental health and rugby in 2012. "We need to talk about depression much more and get rid of the stigma surrounding it," he says.

This year he's looking forward to returning to Japan as DHL ambassador for Rugby World Cup 2019, which starts in September. "I'm really excited about that," he says. "It came about because of my playing and coaching relationship with Japan, and the connections I have in the country. Being ambassador is about helping guests and our Japanese hosts have a really good World Cup experience."

Now retired from coaching, Sir John enjoys family life (his three children are all successful athletes), lives for some of the year in Italy, and keeps involved in the game by appearing as a TV rugby pundit. He also

practices a mindfulness regime every day. "For example, I love cooking," he says. "I read, too, and I enjoy surfing and working out. Part of improving my mental health was finding five or six things that I can do on a daily basis."

As a team coach, how do you promote positive energy in negative situations?

A rugby team is judged every Saturday. Then on Monday, the players have to get up and start all over again. You have to avoid negative thinking – or "mind traps" – by coming to terms with the fact that you can't change the past. Also, when you lose, it's easy to focus on the negativity; but it's important to realize what you've done well and what you can learn from the loss you've experienced. If you do that, you'll be able to look back at the game and take a lot of good things from it. Once you address the issues holding you back, you can move forward.

You've been very open about your struggles with depression. Is it an illness that people are still reluctant to talk about?

Last year, 800,000 people committed suicide around the world because of depression, so it's a pandemic. There's a lot more awareness around it now and I'm really proud of all the people who come out and talk about it. The trouble is, when it's in your mind, you don't think of depression as an illness. You think of it as a weakness. I certainly did for five years and it really affected my confidence as a player.

What was the turning point for you?

Recognizing my depression as an illness was a big part of it. When I eventually went to see a psychiatrist she said: "Rugby player, eh? So what would you do if you had a tight hamstring?" I said: "I'd stop and stretch it." She said: "And if that didn't work?" I said: "I'd ice it and go and see the physio." She told me: "Well, your brain is no different." And that really hit home. Sometimes we try to "ice" depression with the wrong thing – alcohol or self-medication – or we might try to hide it. But what we really need to do is seek out a specialist who can help us deal with it. Some of the greatest things I've learned in life I've learned from a psychiatrist.

Are there any lessons you've learned from sport that might be applied to business?

Be able to "agree to disagree." As rugby players we'll often have disagreements; but if the majority of the team want to play in a certain way, then the minority who disagree have to commit to the strategy as well. That's important in business too. You must say what you think and make sure that people understand your opinion is not personal. But if you're defeated, you have to get behind the majority – rather than remaining silent and then badmouthing them around the water cooler later. ■ Tony Greenway

96

The total number of times Sir John played for the All Blacks

199

The number of tries Sir John scored in his first class-career

LATIN AMERICA'S DECADE OF DISRUPTION IS WELL UNDERWAY

Disruption is needed to boost productivity, but adjustments will take their toll on legacy players.



AN ESSAY BY JOHN PRICE

John Price is Managing Director of Americas Market Intelligence and a 23-year veteran of Latin American competitive intelligence and strategy consulting. jprice@americasmi.com

Uber began operating in Mexico's capital in 2013 with 20 drivers. Today, it is approaching 500,000 drivers and an estimated 12 million customers across Mexico, or 13 percent of all Mexicans over the age of 15. In the U.S., with four times the per capita income of Mexico, Uber has reached an adult customer penetration rate of 15 percent, after ten years of service. The success of Uber in Mexico and across Latin America's largest markets is not an aberration. Today, Latin America is the world's fastest-growing region for other disruptive business models like Airbnb, Coursera and Netflix.

Why is Latin America so ripe for disruption? To begin with, its moribund service sectors have remained untouched by globalization. That is a stark contrast to much of Latin America's manufacturing and agricultural sectors, which go to work each day competing on a global scale thanks to close to 100 trade

agreements signed by Latin American countries over the last three decades.

Embracing the gig economy

Disruptive new business models, most of which are imported, are compelling because they attack and exploit many of Latin America's greatest economic weaknesses. Mexico has long boasted official unemployment levels far lower than the U.S., Japan or Europe but in fact, an estimated 25 percent of adult Mexicans who do work do so less than 40 hours per week, and not by choice. Furthermore, the rigidity of labor laws in countries like Mexico, Brazil, Argentina and Colombia means that 30-50 percent of workers operate informally without receiving legislated benefits and often paying only partial taxes. As a result, gig-economy business models that offer flexible employment are met with enthusiasm. Long before Uber, multilevel marketing firms like Avon, Amway and Herbalife

achieved massive success in Latin America by empowering the most underemployed demographic: women.

Another structural weakness ripe for disruption in Latin America is that of oligopolies and monopolies. Mexico and Brazil have tightly controlled the number of television companies ruling the airwaves. This created media giants like Televisa and TV Azteca in Mexico and Globo in Brazil. The result was limited programming, too many ads for the viewers' liking and excessive rates for advertisers. Little wonder then that Netflix is taking both markets by storm. In 2017, Mexicans watched more Netflix content per user than any other of Netflix's 190 worldwide markets. In fact, five out of the top 10 Netflix binge-watching countries in the world are found in Latin America: Peru (3rd), Chile (5th), Brazil (6th), and Argentina (7th). When customers are suddenly presented with choices for the first time, they tend to glom. The same thing happened in the U.K. with the arrival of cable and satellite TV after decades of operating with four television channels.

Often the thing that is facilitating monopolistic practices is Latin America's greatest structural vice: corruption. People arriving at Mexican airports who want to take a taxi are normally obliged to use the nationally controlled airport taxi monopoly service, which is priced three to five times the cost of Uber. Little wonder that Mexican legislators (who many speculate share in the excessive profits of the national taxi service) have fought hard to prevent Uber's access to airports.

The rise in online learning

Public education in Latin America, which receives more funding (as a percentage of GDP) than in Asia, consistently produces lackluster results with students scoring well below their Asian, European, North American and North African counterparts on international PISA and other tests. When Mexico took on education reform during the Peña Nieto administration, it was discovered that the national teacher's union was grossly corrupt. Its director was thrown in jail, accused of embezzling millions while employing teachers who had not even graduated from high school but acquiesced to paying unmandated portions of their wages to union heads, and through them to politicians. It's hardly surprising, therefore, that online education is growing at breakneck speed in Latin America. Coursera, the world's largest player in the Massive Open Online Course (MOOC) market, began only four years ago developing original content in Spanish in collaboration with LatAm universities. When reported in 2017, enrollment for Coursera grew faster from LatAm countries than from any other region around the world. As far back as 2014, Microsoft provided free online programming courses to over 1 million students in Argentina, Brazil, Chile, Colombia, Ecuador, Mexico and Peru, giving anyone with an internet connection a chance to learn some bankable IT skills.

Traffic drives e-commerce sales

Another Achilles heel in Latin America's productivity is traffic. Of the world's 25 most congested cities in the world, five are in Latin America, 10 in China but only one in the U.S. Traffic is an important driver of demand for e-commerce. Today, e-commerce sales of physical goods in Latin America represent about 2 percent of formal retail, closer to 1.5 percent of total retail product sales. That is a far cry from the estimated 18 percent of penetration of e-commerce/retail in China. The expansion of Alibaba from its base in Brazil and Amazon, and from its success in Mexico, will provide a supplier-side growth push on e-commerce, which Latin Americans clamor for. Beyond the convenience factor, e-commerce provides disruptive cost savings. Brazilian electronics consumers – who traditionally pay three times the retail price of the same goods in the U.S. or Asia – can now buy their next laptop or cellphone directly from a Chinese manufacturer. Even after paying import tariffs, e-shoppers save 30 to 40 percent versus buying in a Brazilian store. For those living outside of Latin America's largest cities, e-commerce offers choice. According to a Credit Suisse report, there is only one square foot of retail space per capita in Mexico and 0.6 square feet in Brazil, versus 21.5 square feet in the U.S. For all of the reasons cited, retail e-commerce should grow close to 150 percent in Latin America over the next six years.

Big opportunities for logistics

The logistics industry, particularly the highly regulated transportation sector, will undergo disruption. E-commerce offers a bold new opportunity for logistics players but also puts their traditionally asset-heavy business models to the test. Last-mile delivery of e-commerce packages is particularly vulnerable to disruption from Uber-like new players who leverage drivers' cars and can deliver in hours what used to take days. Companies like Chazki, the Peruvian startup now also operating in Argentina and Mexico, employs independent drivers navigating their own cars, without cargo licenses or special vehicles or union labor wages. At the other end are cargo players who traditionally kept their pricing out of the public domain, making it difficult to shop and compare. Enter Gurucargo, originally from Uruguay, which formed a marketplace where cargo service buyers could compare and contrast multiple cargo providers like ticket purchasers do on Expedia.

The disruption of different segments of the transportation sector puts an added premium on controlling the client tower, the design and execution of the loftiest end of the logistics supply chain. Those who control the 4PL functions of logistics clients will ultimately have the power to reap the benefits of disruption by trimming excess hard assets and focusing on customer service and a software-driven approach to managing customers' global supply chains. ■

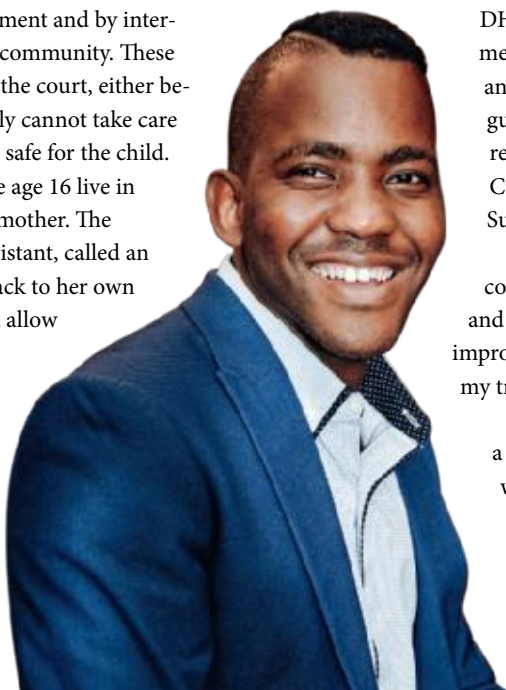
WHAT'S THE STORY, MR. BONASE?

IMPROVING CHILDREN'S LIVES

Keeper Bonase remembers his childhood in an SOS Children's Village – a safe, caring, nurturing community for young people who have lost one or both parents.

I grew up in the SOS Children's Village in Cape Town, part of SOS Children's Villages, an international group of orphanages first founded in 1949 by Hermann Gmeiner, an Austrian medical doctor who saw the suffering of children after World War II.

These villages are funded by the government and by international sponsors who give back to the community. These children are taken into care by order of the court, either because the mother or the rest of the family cannot take care of the child or the surroundings are not safe for the child. At these villages, up to six kids up to the age 16 live in one house and are cared for by an SOS mother. The housemother would usually have an assistant, called an aunty, which allows the mother to go back to her own family every third weekend. This would allow the aunty to also take responsibility for the children. I arrived at the age of six, to the most awesome mother called Rose. This is where my love and passion for cooking came into being – Rose was an amazing cook and she taught us well. She also instilled a love of music in me. Listening to jazz and rhythm and blues every Saturday morning would soothe my soul. I went to



school like any other normal child in the community. This is where I met my best friend, Amkela. He was the friend I would speak with when I felt isolated and lonely, because growing up in an orphanage was not easy since, despite having the SOS family, you still yearn to have a good family of your very own. Amkela and I also had fun, though. We share the best memories and are still good friends today.

At the age of 16 I began receiving careers guidance and had the amazing opportunity to participate in the GoTeach Program, a successful youth partnership between the SOS Children's Villages and DHL, which was formed in 2010. This program helps foster work opportunities for disadvantaged children and youth in over 40 countries.

I am now a regional ambassador for the program.

DHL in Cape Town is my "home away from home." I met my mentor Nisa Ebrahim there, who was not only an inspiration for me but someone I could ask for guidance and support in the work environment. Here I received training in Freight Forwarding and Customs Compliance as well as training in Procurement and Supply Chain Management.

I have dedicated my life to youth empowerment and continue to offer my volunteer services to both DHL and SOS Children's Villages. My commitment to help improve the lives of impoverished young people remains my true mission.

My favorite quote is: "Life is like a roller coaster and a blessing. How you handle your ups and downs in life will depend on the choices you make."

This is what life is all about – and overall, I am truly thankful for everything, each day. ■



www.dpdhl.com/goteach

FACT: SOS Children's Villages is part of DPDHL's GoTeach program and focuses on supporting young people as they make the transition from school to working life

15,500

HOURS

The time DPDHL volunteers invested to mentor young people as part of the GoTeach program in 2018

85%

The percentage of young GoTeach participants who regard volunteers as role models

Photos: Michael Schwettmann; iStockphoto/Getty Images

\$7.68
BILLION

The estimated worth of the blockchain market by 2022. Key factors driving this projected growth include the fast rise in banking, financial services and insurance applications adopting digital currencies and identities. As the technology and the leading vendors of cryptocurrency software mature, so will blockchain's value.



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