



# Delivered.

THE GLOBAL LOGISTICS MAGAZINE

ISSUE 01/2019

**BUSINESS**

## **SUDDEN IMPACT**

Make sure your supply chain can cope with natural disasters

**SOLUTIONS**

## **GREAT MINDS**

Discover why mindfulness could be good for your organization

**VIEWPOINTS**

## **SCHOOL FOR SKILLS**

Meet the African inventor teaching innovation in Tanzania



# THE SHAPE OF THE FUTURE

How digital tech will change the face of manufacturing



DEAR READER,

What will the factory of the future look like? That’s the question we pose in our **Engineering and Manufacturing** focus this issue. What’s certain is that the disrupting influence of digitalization is currently powering a fourth industrial revolution and looks set to transform the manufacturing sector in the years ahead.

Agricultural equipment maker AGCO knows all about the benefits of digital innovation. For example, it was an early adopter of wearable tech to improve its factory operations, and is now using the latest generations of robotic systems on its factory floors. In **Innovation in the field**, we talk to Peggy Gulick, the company’s Director of Digital Transformation.

A move to digital also helped transform the fortunes of a London fashion boutique called Matches, which turned into luxury global retailer MATCHESFASHION.COM. As you can read in **360 degrees of fashion**, online trade now accounts for 95 percent of its sales success.

Finally, we look at another, less benign industry disruptor: natural disasters, from earthquakes to hurricanes. Their frequency seems to be increasing – so how can companies mitigate the potential impact to their supply chains? **Dealing with disaster** has more.

I wish you an enjoyable read!

Sincerely,

Katja Busch  
Chief Commercial Officer, DHL

Cover photo: Adobe Stock

Photos on this page: DHL; phonlamaipphoto/Adobe Stock; iphotothailand/Adobe Stock; private



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PUBLISHED BY DEUTSCHE POST AG

<b>Represented by</b> Anita Gupta SVP Global Media Relations	<b>Project Managers</b> Salvinija Buivydaite Meribel Sinikalda	<b>Address</b> Deutsche Post AG Charles-de-Gaulle-Strasse 20 53113 Bonn, Germany Tel. +49 (0) 228-18 20	<b>Commercial Register No.</b> Registration court Bonn HRB 6792 <b>Turnover Tax ID No.</b> DE 169838187 <b>Website</b> www.delivered.dhl.com
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**Paper**  
This magazine is made from 100% recycled paper.

We are committed to protecting the environment and the world’s resources.

**Print**  
optimal media GmbH  
Glienholzweg 7  
17207 Röbel / Müritz  
**Print Coordination**  
Heiko Belitz (resp.),  
Matthias Richter



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A FITTING SOLUTION

Ordering clothes online and having them delivered to a local service point is quick and convenient – except when you get your purchases home and find they’re not quite right: the color is wrong, they don’t fit or just don’t look good. Then you have to return the package, often to the parcel depot where you picked it up in the first place, which takes away from the time saving and convenience that are such important fac-

tors in online shopping. DHL Express in the Netherlands is trying a new solution out for size by offering fitting rooms at the service point itself, where customers can try on the clothes they’ve bought and send them straight back if they’re not happy. Two service points, in The Hague and Amsterdam, are trialing the service, which was dreamt up by retail management students from Avans University in Breda near Rotterdam.



\$169,411

MILLION

The predicted size of the global artificial intelligence market by 2025 – a compound annual growth rate of 55.6 percent as compared with today

ROBOT REVOLUTION

Leading technology company ABB Ltd is investing €132 million (\$150 million) to build a robotics factory in China so as to capitalize on the country’s aspirations of becoming a tech pioneer. The plant will manufacture about 100,000 robots annually, from small payload machines to large robots that can lift an entire car. China is now ABB’s second largest market, with annual sales of €5.28 billion (\$6 billion).



 [bit.ly/abb-robotics](https://bit.ly/abb-robotics)

Photos: DHL; jimm/Adobe Stock; ABB; The Asahi Shimbun/Getty Images; BrasilNut/1/Getty Images; Andreas Neubauer/Adobe Stock; PR

GROUND FORCE

A year on from taking over airline easyJet’s ground handling at London Gatwick, DHL Supply Chain is set to add the same operations at two other U.K. airports. DHL will take over ground handling at Manchester and Bristol, assuming responsibility for a further 1,200 flights a week. It will deliver core customer service and logistics operations including passenger arrival and bag drop, baggage sorting, boarding gate marshalling, and aircraft loading and unloading. DHL staff will handle some 700 flights a week in and out of Bristol, where easyJet is the largest carrier serving some five million passengers a year, and an additional 500 flights at Manchester. At Gatwick, DHL has already invested in 480 pieces of new equipment to improve performance and cut carbon emissions, as well as a training program for staff.

 [bit.ly/dhl-easyjet](https://bit.ly/dhl-easyjet)

FULL NELSON

How do you get a life-size statue of Nelson Mandela from South Africa to New York? The bronze, the only life-size statue at the U.N. headquarters, was unveiled in September by South African president Cyril Ramaphosa in the presence of Mandela’s daughter Makaziwe. Before that ceremony could go ahead, there was a carefully orchestrated operation to get the statue safely from a workshop in

South Africa to the U.N. building in Manhattan. First, DHL Global Forwarding in Johannesburg visited the statue’s makers to find out what they were dealing with. Then DHL staff at JFK airport and South African government representatives at the U.N. met to discuss the security arrangements before the wooden packing crate with its precious cargo was flown to New York.



67

PERCENT

The percentage of European citizens who are convinced that their country benefits from being a member of the EU, the highest score since 1983, according to a survey by Eurobarometer

IF THE CAP FITS...

Two Dutch inventors have really put the “cycle” into recycling by using waste plastic to create two new bike paths. The short cycle routes in the town of Zwolle and the village of Giethoorn are a step toward making roads out of recycled plastic waste, say creators Anne Koudstaal and Simon Jorritsma. The first 30-meter path, which contains the equivalent of 500,000 plastic bottle tops, opened in Zwolle in September, with the second following in Giethoorn in November 2018. Both paths are reckoned by their inventors to be up to three times more durable than conventional road surfaces, and were created as part of an initiative by Dutch engineering firm KWS, pipe maker Wavin and French oil giant Total. The Dutch government has pledged to halve its use of raw materials by 2030 and move toward a circular economy.

 [bit.ly/bike-path-recycled](https://bit.ly/bike-path-recycled)



4

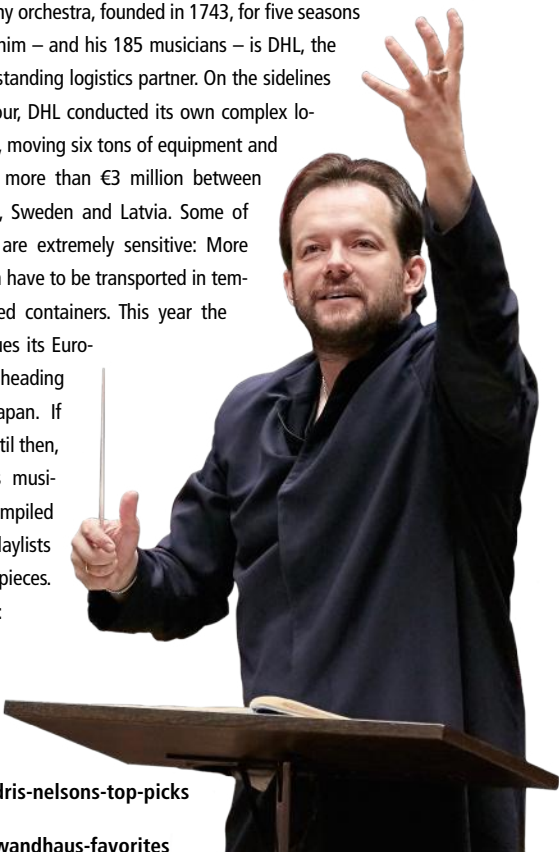
5



LET THE MUSIC PLAY

2018 was a special year for conductor Andris Nelsons – in May he took up the baton as music director of the world-famous Leipzig Gewandhaus Orchester and performed in his home country of Latvia in the autumn. The 40-year-old former trumpeter will conduct the symphony orchestra, founded in 1743, for five seasons initially. Helping him – and his 185 musicians – is DHL, the orchestra’s long-standing logistics partner. On the sidelines of the autumn tour, DHL conducted its own complex logistical orchestra, moving six tons of equipment and wardrobe worth more than €3 million between Germany, Britain, Sweden and Latvia. Some of the instruments are extremely sensitive: More than 100 of them have to be transported in temperature-controlled containers. This year the orchestra continues its European tour before heading to China and Japan. If you can’t wait until then, Nelsons and his musicians have compiled two Spotify playlists of their favorite pieces. Listen to them at:

-  [bit.ly/andris-nelsons-top-picks](https://bit.ly/andris-nelsons-top-picks)
-  [bit.ly/gewandhaus-favorites](https://bit.ly/gewandhaus-favorites)




BRIDGE OF SIZE

China has opened the world’s longest sea bridge after a nine-year construction project that has cost €17 billion (\$20 billion). The 55-kilometer-long bridge – some 20 times longer than San Francisco’s Golden Gate Bridge – links Hong Kong and Macau to the Chinese mainland. It’s part of China’s plan to create a global science and technology hub



# \$10,000

The amount being offered by Tulsa in the U.S. to digitally skilled workers who are prepared to relocate there and “add to the dynamism, idealism and get ‘er done spirit” of Oklahoma’s second-largest city



APRIL

2-4

DHL’s 2019 Global Technology Conference in Singapore. It’s a chance to share, learn and network with your industry peers.

 [www.event-dhl.com/technologyconference](https://www.event-dhl.com/technologyconference)

JUNE

17-19

The 19th DHL Global Life Sciences and Healthcare Conference will take place in Miami, Florida, offering the chance to engage with industry peers, leading suppliers and DHL experts. The theme of the event will be “Forward-thinking, intelligent healthcare.”

in the Greater Bay Area, which has an economic output of ¥11 trillion (\$1.83 trillion) and the potential to rival Silicon Valley in the U.S. An \$11 billion new bullet train, which came into service in September last year, is another key part of the plan. The bridge – whose curves are meant to resemble a snake – includes a 6.7-kilometer undersea tunnel.

Photos: Jens Gerber; Davel5957/Getty Images; xinhua; DHL (2); Adobe Stock; PR

REDEFINING THE LAST MILE

Urban populations are growing, and with them the needs of wealthy, tech-literate, busy city dwellers who want their goods in a fast and convenient way. As online shopping becomes ever more popular among young urbanites, last-mile deliveries are becoming crucial, with logistics providers having to ensure a seamless experience for the customer, who in turn has more nuanced requirements and increasing expectations with regard to environmental responsibility. A new DHL white paper compiled by Euromonitor International looks at ways to meet this last-mile challenge while maintaining profitability, using key pillars such as flexible transport networks, automation and data management enhancements. Read the white paper, “Shortening the Last Mile: Winning Logistics Strategies in the Race to the Urban Consumer,” at:

 [logistics.dhl/urban-consumer](https://logistics.dhl/urban-consumer)



DELIVERIES IN THE DRIVING SEAT

You want to collect a parcel, but can’t find a parking space near the delivery office. Frustrating, isn’t it? But what if you could get your delivery without even getting out of your car? DHL customers in the German spa town of Bad Kreuznach can now do just that, as a six-month pilot project allows them to pick up parcels from an outlet with a drive-through service. The DHL branch on the town’s Schwabenheimer Weg has a window where drivers can pick up parcels and even drop off mail.

IT’S GOOD NEWS WEEK

In a world where strife and conflict are commonplace, the news headlines can sometimes seem relentlessly downbeat. But some media outlets are trying to combat this negative image by devoting some of their output to “good and positive news” as an antidote to the dreary diet of depressing stories. MSN, the Huffington Post and the New York Times are among a growing number who now run “good news” sections or digests on their websites.



AN ANSWER FOR THE PRESS?

Faced with dwindling readerships and online competition, newspapers have never been under such threat. But Britain’s Guardian newspaper may have found a business model that could help journalism survive and prosper. The group invited readers to donate to the paper to allow it to continue investigative reporting, such as recent stories on the Facebook data breach, and keep its online journalism outside a paywall. More than a million people from 170 countries have contributed in the past three years, half of them on a regular basis, allowing the paper to break even for the first time in several years.

 [bit.ly/guardian-one-million](https://bit.ly/guardian-one-million)

HERE IS THE NEW FACE OF THE NEWS

Take a deep breath, TV current affairs presenters everywhere: China’s state news agency has unveiled a virtual newsreader. The English-speaking anchor on Xinhua News, based on a real presenter from the channel, has been developed in partnership with Chinese search engine firm Sogou. Unlike its human counterparts, it can work 24 hours a day to deliver breaking news on the broadcaster’s website and social media channels. And it’s not alone: Xinhua has a Chinese-speaking version too. But the anchormen and women needn’t quit their teleprompter duties just yet – the virtual presenter had no “rhythm, pace or emphasis,” Oxford University computer science professor Michael Wooldridge told the BBC.

 [bit.ly/ai-news-anchor](https://bit.ly/ai-news-anchor)





# THE END OF THE LINE?

Will digital technologies transform  
manufacturing beyond recognition?







#### FACTORY SETTING:

Digitalization is powering a new industrial revolution that is having an impact on the factory floor.

industry clusters, and to maintain investment as labor costs rise.

Nobody knows, however, exactly what form those future factories will take. Some think nostalgically about the large-scale employment provided by the vast, labor-intensive manufacturing plants of the past. Others have a vision of mass automation, with every task completed, with unerring precision, by an army of robots.

Some believe that advances in technology will undermine the very characteristics that made the factory model so successful. They envision a return to small-scale distributed production, where ultraflexible automated manufacturing equipment allows microfactories to make a wide range of products to order for local customers, a high-tech version of the pre-industrial blacksmith's shop.

Which of those visions is more realistic? Most probably, tomorrow's factories will contain a little of each.

#### Still working

First, take jobs. Decades of rising productivity, driven by a combination of automation and smart management, mean that manufacturing industries need fewer people to produce the same level of output. In mature economies, a return to historical levels of factory employment is unlikely. In the U.S., for example, manufacturing employment as a share of total employment peaked in the 1920s and has been declining ever since. And even the new manufacturing powerhouses of East Asia are looking to automation rather than an ever-expanding workforce to fuel their long-term growth.

Researchers at consultancy McKinsey & Company estimate that, in manufacturing organizations, around 60 percent of the tasks currently completed by people could be automated using technologies that already exist today. Significantly, that number includes activities away from the factory floor, like design and management. McKinsey believes that the technical ability to automate the remaining tasks is likely to evolve by the middle of this century.

That doesn't mean manufacturing jobs will disappear any time soon. To be adopted at scale, automation must be economically viable and socially acceptable, not just technically feasible. The McKinsey researchers believe that this transition will take 100 years or even more.

#### The human-machine interface

The vast majority of 21st-century factories will continue to involve collaboration between people and machines. The distribution of tasks between them is likely to

change dramatically, however. Digitalization is powering a new industrial revolution, one that proponents claim will result in a step change in speed, quality, productivity and flexibility.

Technological change is touching all aspects of factory life. Robots are getting cheaper, more capable and easier to use, for example. That's allowing companies to use them outside the relatively narrow range of tasks that they have hitherto dominated.

But an even larger transfer of responsibilities is underway behind the scenes. The development of advanced data analytics, some of them powered by artificial intelligence (AI) technologies, means machines are taking increasing responsibility for high-level decision-making in manufacturing: planning production schedules, fine-tuning processes and solving problems.

One company that is positioning itself on the frontline of this "fourth industrial revolution" is U.S. industrial conglomerate Honeywell. Eric Seidel is Vice President of Strategy and Chief Marketing Officer for the company's Process Solutions business. He explains that improved data connectivity will be a key enabler for the future transformation of manufacturing.

"Today's factories are generating gigabytes of data, from their processes and production assets and even from the workflows of their people. But that data isn't yet connected," he says. "The factory of the future won't just connect all its data seamlessly, enabling actionable insights and much faster decision-making, it will also extend those connections beyond the four walls of the factory. For the first time, manufacturers will be able to think about the whole supply chain, all the way

*"For manufacturers those requirements translate into a far larger number of variants, and far shorter planning, order and delivery cycles."*

Reg Kenney, President Engineering and Manufacturing, DHL

upstream into their suppliers and all the way downstream through logistics and into their customers."

Improved connectivity creates three major opportunities for manufacturers, Seidel continues. "The first is that, across your entire supply chain, digitalization will eliminate a huge amount of the variability that companies have to deal with today: Every day will be your best day of performance."

The second big opportunity is the use of technology to empower the factory workforce, by providing dramatically improved access to data and information. With the right tools and support infrastructure in place, he says, "everybody on your site can act as a leading expert." The tools and systems that enable that expertise include advanced training technologies, such as virtual reality (VR) systems and augmented reality (AR) technologies that use smart glasses to overlay information on the workers' field of view, says Seidel.



**A DIFFERENT VIEW:**  
Wearable virtual reality systems are making life easier for factory workers.

**MACHINE AGE:**  
Robots are getting cheaper, more capable and easier to use.

60  
PERCENT

The percentage of human tasks in manufacturing that could be automated using available technologies

Photos: phonlamphoto/Adobe Stock (previous page); Westend61/Adobe Stock; Milan Szypura/Haytham-Realist; Kristian Bocs/Bloomberg/Getty Images



The third and final opportunity, he suggests, is to identify and capture opportunities for further process improvement outside of the plant's four walls with the help of smart analytics. "Once we are operating so every day is as good as the best day and every employee is as effective as the leading expert, we can start to look across factories and ask 'how well does the best facility in the world perform?' Then we can start to use continuous improvement to enhance the output or the throughput of the plant until our performance matches the best that can be achieved."

Right now, says Seidel, while many of Honeywell's customers are pursuing this vision of digitally enabled manufacturing excellence, most are only part of the way into their journey. The picture he paints is one of rapid change, however. "Three or four years ago, there was a lot of hype around digital manufacturing. Companies were wondering what these technologies might do for them. There was a lot experimentation and proof-of-concept work going on."

Today, he says, companies are beginning to employ advanced digital approaches in production, but most effort is focused on individual assets rather than complete factories or supply chains. "We see companies connecting a single pump or chiller unit to a cloud data service provided by the manufacturer of that asset, and they're getting a lot of insight from doing that." Those insights might include the use of predictive analytics to optimize energy use or enhance reliability, he explains.

The next step beyond this "vertical" digitalization is for companies to make use of "horizontal" connections, first between the machines in their own facilities

and eventually across the supply chain, to supplier and customer machines, facilities and processes. That's rare today, but it is something that Seidel expects to see "on a much more common basis over the next couple of years."

### What's stopping you?

Does that mean the factory of the future could already be here? Technology isn't the primary barrier to development, says Seidel. "It's already relatively simple for companies to connect their manufacturing assets to digital networks." Some companies are still cautious about the idea of shared, centralized data, however, especially when they start to think about systems that are accessible beyond the barriers of their own organizations.

"In our discussions with manufacturing companies today, we come across two related sets of concerns," he notes. "The first is over cybersecurity, and the second is about the choice of cloud. Do they host their own data, or choose a system provided by an OEM or a third-party partner?"

It's no surprise that manufacturers want to protect their data. Decades spent incrementally improving the performance of their operations has taught these companies that it's the small details that can matter most in manufacturing competitiveness. And cyberattacks have already stopped production lines in several plants around the world. Sensitive data isn't unique to manufacturing, however, and other industries have shown that concerns over data security and availability can be overcome with the right partners and effective management.

What about the workers? Is there significant resistance to digitalization among factory personnel? In



**TAKING STOCK:** Wearable scanning technology offers improved access to data and information.

practice, Seidel says that implications for the workforce are usually "among the easier discussions" Honeywell has when it talks to customers about digital factory projects. In part, he says, that's because many companies are already wrestling with skills shortages and an aging workforce. "In the industries we serve, around 40 to 43 percent of skilled labor is going to leave the industry over the next six to eight years. Companies are already trying to figure out how they are going to manage the loss of skills and knowledge as employees who have worked for them for 20 or 30 years reach retirement age." Against that background, he says, companies may see digitalization as a way to accelerate training and keep know-how inside the organization.

### Closing the loop

The factories of the future will require new approaches to logistics too. Digitally enabled manufacturing won't just enhance efficiency, it will also make production systems far more responsive to their customers, notes Reg Kenney, President Engineering and Manufacturing, DHL. "We are already seeing how customers want faster service and products that are tailored to match their needs. For manufacturers those requirements translate into a far larger number of variants, and far shorter planning, order and delivery cycles."

As factories become faster on their feet, the rest of the supply chain must do the same. "Speed and flexibility are becoming increasingly critical for our customers across the engineering and manufacturing sector," says Kenney. "Digital technologies can help here, by improving the way companies share information like demand forecasts, but they also need advanced logistics capabilities to cope with fast-changing demand." ■ Jonathan Ward

## 3 QUESTIONS FOR

Reg Kenney,  
President Global  
Engineering  
and Manufacturing,  
DHL



### 1. Is the fourth industrial revolution already under way?

Absolutely, many of our customers have embraced new, digitally enabled manufacturing technologies with considerable success. That's happening right across the engineering and manufacturing sector, even in long-established businesses operating in quite traditional industries. Right now, however, it's clear that different companies are pursuing different approaches and developing at different rates.

### 2. What will the rise of digital manufacturing mean for supply chain and logistics processes?

We expect digitalization to accelerate many of the trends that we are already seeing across the industry. As big manufacturers increase the flexibility and responsiveness of their own operations, they'll need their suppliers to do the same. If the whole supply chain doesn't develop at the same rate, you start to get problems. We've already seen signs of that happening in the U.S., for example, where some major manufacturers say that their suppliers are struggling to keep up with rapidly rising demand.

### 3. How will the role of service providers like DHL evolve as manufacturing becomes more digital?

As a service provider, we can support the needs of future manufacturing supply chains by enabling the fast, flexible logistics processes companies will require. And I also see a role for providers like us in helping to manage rising supply chain complexity, whether that's by consolidating shipments from multiple suppliers or helping our customers manage supply chain data more effectively.

**SCREEN TEST:** Companies are employing advanced digital approaches on production lines.







**VEHICLE FOR GROWTH:**  
Peggy Gulick, AGCO's Director  
of Digital Transformation,  
Global Manufacturing.

# INNOVATION IN THE FIELD

AGCO is bringing digital technology to the agriculture industry – and to the factory floor.

It's an activity that predates the first industrial revolution by several thousand years, but agriculture has always embraced new technologies. Today's farmers operate machines guided by precision GPS systems, and make decisions on the basis of high-resolution satellite imagery and advanced analytics technologies.

For agricultural equipment maker AGCO, high-tech has long been an integral part of its customer offering, but the company is also positioning itself at the forefront of the digital revolution in manufacturing.

A relatively young company, AGCO was formed as the Allis-Gleaner Corporation in 1990 when U.S. managers bought the Deutz-Allis tractor and equipment manufacturer from German owner KHD. The business grew rapidly through a series of acquisitions and AGCO now owns a number of major agricultural equipment brands, including Challenger, Fendt, Massey Ferguson and Valtra. Today, the company has a truly global presence, with 53 manufacturing plants worldwide and sales and support activities in every major market.

Peggy Gulick is AGCO's Director of Digital Transformation, Global Manufacturing. The role has existed for only a year, but Gulick explains that individual plants have been exploring and applying digital manufacturing technologies for some time. Her job is to encourage the continued development of new digital solutions, and to help plants across the AGCO network to adopt approaches that have proved successful elsewhere in the group.

That's a model that AGCO understands very well. The company has developed a sophisticated manufacturing philosophy, the AGCO Production System, built on lean principles of standardization, waste reduction, continuous improvement and root cause problem solving. Every one of its plants now uses that system, adapted to suit local differences in production volumes and product complexity.

Gulick sees her current role as a logical extension of the company's existing approach to manufacturing excellence "I look at digital as the next step in our continuous improvement journey, a bit like continuous improvement on steroids," she says. "The market has given us an amazing array of new technologies, like robots and wearable devices, and we want to use those to add more value to our continuous improvement efforts."

## First sight

The company's first big digital success story came from the introduction of wearable devices on its production lines. The work started in 2013, says Gulick, at the time

Google was developing its Glass augmented reality spectacles as a potential consumer product. Intrigued by the industrial potential of the technology, AGCO worked with technology partners to develop wearable applications for its production line personnel.

Initially, it focused on quality control and inspection activities, with a system that could guide inspectors through the complex lists of checks made to every tractor before it is released from the production line. "On our initial tests we were seeing a 32 percent process improvement though the introduction of the wearables, a result that far exceeded our expectations," she says.

Intriguingly, much of the benefit delivered by the system came from improvements that weren't part of the original project scope. "We were looking for a way to make our employees' jobs easier, but the really big win came from the ability to report non-conforming products or quality issues in real time." When inspection personnel identify and log an issue, AGCO's system immediately alerts members of the manufacturing quality team. That allows them to take action straight away, potentially preventing a repeat of the same problem on other machines currently in production.

Those successes have encouraged AGCO to expand its use of wearable devices to other production activities. Augmented reality glasses are now being used to guide operators through complex assembly tasks, for example. "We work very closely with our people to ensure the system gives them exactly the information they need," explains Gulick. "That means you might provide a different level of detail to staff depending on their training or experience with a given task, and you can alert them to activities that require special attention, like design changes or areas where quality issues have been identified."

## Plowing through the data

Wearable devices don't just present data to AGCO manufacturing personnel, they generate data too, as staff click through task checklists and mark activities as complete. Together with the reams of data generated by sensors on production machines, that information is fueling another of AGCO's digital strands: advanced analytics. The company is applying an array of analytical approaches to the data generated in its manufacturing operations, with the aim of unearthing new opportunities to trim waste, boost productivity and prevent problems.

The ability to analyze detailed production data is helping the company to improve its factory operations in many ways, says Gulick. The ability to see exactly how long each production step takes to complete, for example,

53

The number of AGCO plants worldwide

32  
PERCENT

The process improvement resulting from the introduction of wearable devices on the production line



*“We were looking for a way to make our employees’ jobs easier, but the really big win came from the ability to report non-conforming products or quality issues in real time.”*

Peggy Gulick, AGCO’s Director of Digital Transformation, Global Manufacturing

helps factories to balance their lines more effectively, ensuring that people and machines don’t have to waste time between activities waiting for other operations to finish. The company is also looking at real-time analytics as a way of enabling pre-emptive action to address problems on the line. “If you know exactly how long a certain task typically takes, and the data shows that something is going unusually slowly, that might be an indicator that an employee is struggling with an issue, and maybe they need help to resolve it,” she explains.

AGCO has even built full digital simulations of manufacturing plants, allowing it to model the flow of people, parts and products through the complete production process. That’s still a costly and labor-intensive activity, says Gulick, but the approach is extremely useful in the planning of complex projects, such as building a new plant or reconfiguring production lines to accommodate several types of machine.

### Innovative, collaborative, additive

While much of AGCO’s digital effort is designed to support its human workers, the company is also investing in advanced automation. That work has a long history. The company’s factories already make extensive use of robots in activities that play to their traditional strengths, like welding and paint spraying. And several

plants use automated guided vehicles (AGVs) to move parts and machines between workstations.

Today, however, it is also making use of the latest generations of robotic systems, which offer new capabilities and additional flexibility. “Our older AGV systems follow a magnetic track in the floor of the plant,” notes Gulick. “Now we are working to bring in fully autonomous models that can navigate without those fixed guides. That’s important because it simplifies things when we want to adapt or reconfigure a facility.”

Some plants have also piloted cobots, collaborative robots designed to work safely alongside human operators. The technology is a promising one for some tasks that human workers find strenuous or tricky to complete with the required consistency, says Gulick. She notes, however, that there is still work to do before cobots are sufficiently capable, or user-friendly, for more widespread application.

One technology that has spread more quickly across AGCO’s manufacturing operations is additive manufacturing, or 3D printing. The company doesn’t yet use it for the production of components used in its finished products, but manufacturing teams are constantly coming up with new applications for the technology, from precisely shaped covers to mask parts in the paint shop to replacement components for older manufacturing machines.

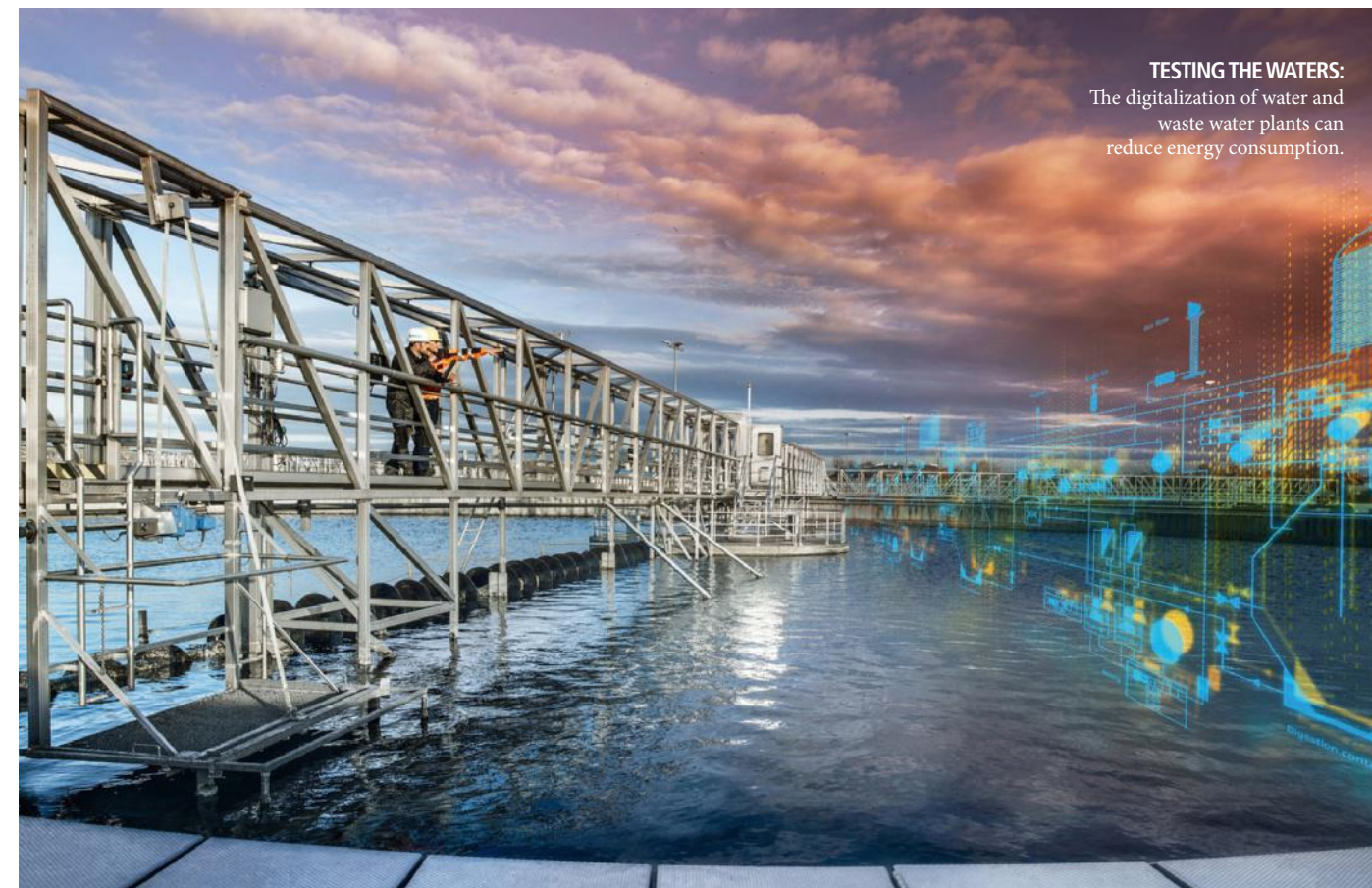
### Skills, scale and support

So how will AGCO’s manufacturing operations change most over the next five years? “A lot of people think that digital manufacturing is about replacing people with automation, but it’s really critical to understand that actually it’s about enhancing your people,” says Gulick. “There’s no doubt that the jobs our workers do are going to change significantly over the next three to five years, and that’s something we are really focused on right now. They will need to be comfortable with technology, able to work alongside automated equipment and to program these new machines. We are doing a lot of work to get our people ready for that new world, including sending staff back to school to learn about these new technologies.”

Overall, says Gulick, AGCO has plenty of reasons to push on with the development of a broad range of digital manufacturing approaches. Not every experiment pays off, she notes, but those that do often deliver value that exceeds the company’s initial expectations by a factor of three or more. Replicating its successes across the organization will help the company achieve the demanding improvement goals it has set for itself, which include a 20 percent overall productivity increase over the next five years. “Digital innovation requires you to think big, start small and fail fast,” says Gulick. “But when things do work, you need to scale even faster.” ■ Jonathan Ward

 [www.agcocorp.com](http://www.agcocorp.com)

Photos: AGCO Corporation; Siemens



**TESTING THE WATERS:**  
The digitalization of water and waste water plants can reduce energy consumption.

## A DOUBLE LIFE

Digital twins are transforming the way manufacturing companies design, build and operate their facilities. They have important implications for products too.

**F**or Harry Potter and his friends, the Marauder’s Map is a powerful ally in the battle against the forces of the Dark Arts. Not only does the map describe the network of corridors and secret passageways that crisscrosses Hogwarts School of Witchcraft and Wizardry, it also reveals the precise, real-time location of every character within its walls.

Today, companies are using the magic of advanced digital technologies to gain a similarly comprehensive view of their designs, facilities and manufacturing operations – and even of their products once in customer hands. These modern industrial versions of the Marauder’s Map are known as digital twins.

Siemens, whose Product Lifecycle Management (PLM) division is a major provider of the technologies that underpin digital twins, defines them as “a virtual representation of a physical product or process, used to understand and predict the physical counterpart’s performance characteristics.” In practice, a digital twin is not one thing, but many: an aggregation of different

data sources and modeling technologies. The approaches and technologies used in a given application vary considerably, depending on the nature of the product and the part of its lifecycle being described.

### From blueprints to virtual prototypes

Representing a physical object with a parallel collection of information is nothing new. Designers and engineers have made and stored drawings and bills of materials since before the first industrial revolution. But the development of increasingly powerful computer systems has allowed these representations to become ever more detailed and capable over time.

The transition began in the last decades of the 20th century, as companies replaced drawing boards with computer terminals. The first computer-aided design (CAD) systems were nothing more than digital drawing programs, but these systems quickly evolved. Two-dimensional digital drawings became three-dimensional digital models. Advances in simulation technology allowed engineers to model mechanisms and moving

**50  
PERCENT**

The percentage of large industrial companies expected to use digital twins by 2021

**PICK OF THE CROP:**  
Today’s farmers operate machines guided by GPS systems and make decisions based on advanced analytics.







parts, and finite element analysis techniques let them study the distribution of forces through structures or the flow of fluids around them. At the same time, manufacturing engineers began to adopt computer systems for modeling the flow of products through production, helping them optimize the layout of plants and the design of processes.

### Closing the data loop

The advent of the digital twin required the development of another set of technologies, however: the internet of things. The availability of sophisticated but inexpensive sensors and fast network technologies allowed the previously one-way flow of digital data to become a two-way exchange. For the first time, digital representations of physical objects could become dynamic, growing and evolving alongside the real thing.

As a result, while a product is being manufactured, for example, its digital twin can accumulate information on the batch of raw material used in its construction, the tolerances to which it was machined and the worker who completed each assembly operation. And as that product enters service, the model can go on growing, recording hours of use, operating conditions and maintenance interventions.

Right now, however, the biggest use case for digital twin technologies isn't products themselves, but the factories that make them. A comprehensive digital model of a manufacturing plant can offer its owner a huge range of potential benefits. Factories are big, complex places: Their design has to accommodate the flow of materials and people, as well as the provision of multiple services including electrical power, water,

### TWIN TRACK:

Advanced digital technologies can give companies a comprehensive view of their designs.

compressed air and ventilation. They are also highly dynamic. Machines are continually replaced or upgraded, production lines are reconfigured to accommodate new products or boost productivity. And smart machines and advanced automation systems generate a vast and ever-increasing flow of data.

A digital twin helps a factory owner to keep that complexity under control, providing a single home for data that was previously dispersed across different systems and business functions. And it allows companies to manage their facilities in more sophisticated ways: analyzing operational data to identify the root causes of reliability problems and spot productivity improvement opportunities, for example. Research company Gartner predicts that half of all large industrial companies will be using digital twins by 2021, and that those companies will enjoy a 10 percent improvement in efficiency by doing so.

Those benefits aren't automatic, however. Building and maintaining a digital twin is still a complex and costly process. Many factories incorporate a mixture of new and legacy production assets, and the data describing those assets isn't always available in an accessible format, if it exists at all. Companies often have to resort to clever tricks in order to build their digital models, such as using laser scanners to capture information on the as-built geometry and location of structures and equipment.

### Twins in the wild

Wider application of the digital twin concept creates ethical challenges as well as technical ones. Companies usually own the assets they use in their factories. Once you have sold a physical product to a customer, who owns the rights to its digital twin? Concerns over privacy and the potential misuse of data are already widespread in the worlds of e-commerce and social media. Now consumers are raising the same questions about the growing number of connected products in their lives. Consumer rights advocates are already raising questions about the use of connected toys that collect data on the behavior and preferences of their users, for example.

Questions surrounding the security, privacy and ownership of digital product data remain unresolved in many sectors, but these challenges are unlikely to stop the growth of the approach in new sectors and new applications. It might not be long before a product or production line without a digital twin seems somehow incomplete. ■ Jonathan Ward

Photos: Siemens; Interfoto/Stocktrek Images

# BUSINESS

## ALL TOGETHER NOW?

The world is becoming more connected, but there are also barriers and threats to globalization. The DHL Global Connectedness Index explores which countries and regions are most connected and why.

**C**ontrary to fears that globalization could collapse under the weight of resurgent economic nationalism – reflected by the 2016 Brexit referendum and President Trump's "America First" stance – the DHL Global Connectedness Index, which measures the flow of trade, capital, information and people, hit a record high in 2017.

Moreover, the Index – developed by New York University globalization experts Professor Pankaj Ghemawat and Steven A. Altman together with Phillip Bastian – highlights how the world is actually far less globalized than most of globalization's antagonists believe. Despite all our advances in transportation and communications, international trade, capital, information and people travel only 60 percent as far as they would in a "flat" world, and more than half of those journeys take place between countries and their top three destinations. Meanwhile, a mere 3 percent of people live outside of the country where they were born.

Unsurprisingly, eight of the 10 most globally connected countries in 2017 – including the U.K. and Germany – are in Europe, the world's most connected region, which tops the index for trade and people flows.

Economies with the highest proportions of flows crossing national borders are all wealthy and relatively small, such as Singapore or Belgium, while countries with the most global flow patterns are wealthy but larger, such as the U.S. and South Korea.

Nations' connectedness scores are also influenced by their proximity to the sea, foreign markets and shared languages. The countries whose depth of international flows most exceeded expectations include Cambodia and Vietnam, although this is partly explained by regional supply chains.

The GCI's connectedness metrics are designed to help companies navigate calmly through current and future turbulence. The report

helps identify which countries are most exposed to threats to particular types of flows, and whether that exposure is global or more narrowly constrained. It can also contribute to more productive debates about globalization by clarifying distorted perceptions, such as the actual proportion of immigrants – the biggest public concern on both sides of the Atlantic, according to recent surveys.

At the moment, although emerging economies trade almost as intensively as advanced ones, the GCI shows advanced economies are more than three times as deeply integrated with international capital flows, five times as deeply with people flows, and nine times as deeply with information flows.

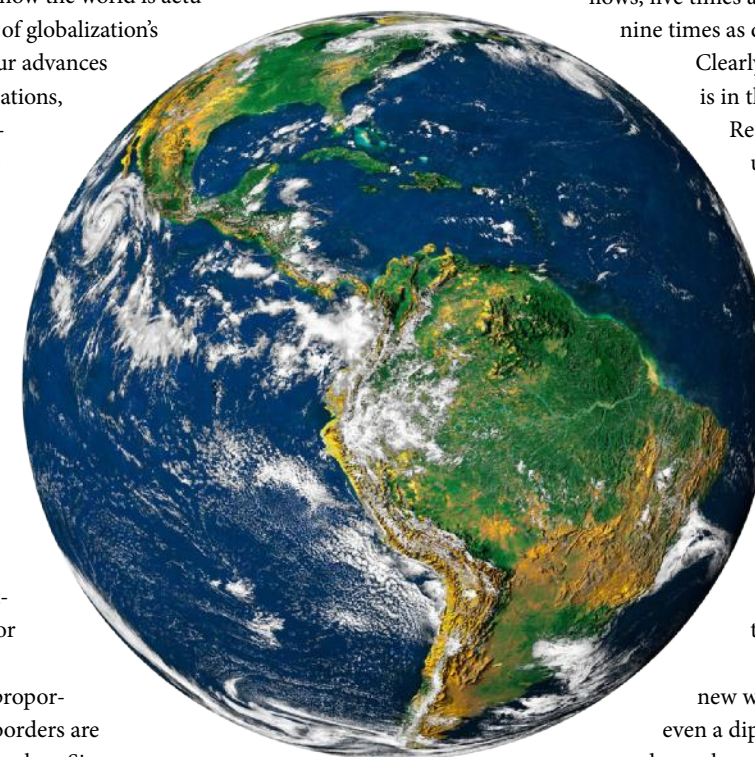
Clearly though, globalization's future is in the hands of the policymakers.

Recent tit-for-tat tariff hikes have undoubtedly raised the specter of a trade war between the U.S. and China, while other countries have signaled that they are keen to curb foreign corporate takeovers, slash immigration and restrict international data transfers. While there is insufficient data to forecast overall global connectedness levels for 2018, the available figures suggest that these developments have impacted international flows.

The coming years may bring a new wave of globalization, a plateau or even a dip. However, the biggest winners under each scenario, according to the GCI, are

likely to be those who embrace globalization's complexity rather than those who see the world purely in terms of local versus global. ■ Boyd Farrow

The new GCI study will be available as of February 12. To download it, please visit:



10  
PERCENT

The average improvement in manufacturing effectiveness achieved through the use of digital twins





**BRIDGE TO PROSPERITY:**  
Investments in infrastructure  
have played a big part in the  
transformation of Vietnam.

# VIETNAM: THE DRAGON RISES

Rising on the back of a strong manufacturing base, a strategic geographic location and a booming middle class, Vietnam has become one of the most sought-after destinations for companies looking to move production to Southeast Asia.

**A**fter decades of war, recovery, seclusion and economic stagnation, Vietnam has arisen as one of the hottest emerging markets in Asia. On the back of a booming manufacturing sector, a favorable geographic location, heavy investments in infrastructure and key trade pacts with several big economies, Vietnam has transitioned from being one of the poorest countries in the world to a highly sought destination for the world's largest companies. Nevertheless, there are still challenges as the country rushes to fill its infrastructure gap.

## The emerging market story

The modern Vietnam story starts roughly 30 years ago when the country first began opening up to foreign

investment. At this time, the country was the quintessential backwater, with a GDP in the ballpark of \$6 billion, and was scarcely on the radar of the world economy. Now, after three decades of concerted economic reform, Vietnam has jumped to the forefront of Asia's new guard of booming economies with a GDP that topped \$223 billion last year and a growth rate hovering around 7 percent. According to MIT research, Vietnam became the 21st largest exporter in the world in 2016, with an \$11 billion trade surplus – a complete about-face from 1995, when the country faced a \$2.29 billion deficit. By 2017, trade as a percentage of Vietnam's GDP was in the ballpark of 200 percent, which is the highest figure the World Bank has ever measured for a country with over 50 million people.

This economic success can partly be attributed to Vietnam's participation in a variety of major international trade organizations and agreements. In 2007, Vietnam joined the World Trade Organization (WTO), it has been a member of ASEAN since 1995, and was one of the original signatories to the Trans-Pacific Partnership. In addition to being part of the ASEAN free trade area, it has established key trade pacts with China, Australia, New Zealand, Korea, India, Japan and the Russian-led Eurasian Economic Union, and a big free trade agreement with the European Union will soon come into effect.

In addition to integrating into the global economy in terms of trade, Vietnam is liberalizing its domestic policies in regards to business ownership and investment, now allowing foreign firms to have 100 percent ownership of a company in Vietnam.

## Favorable geography

Enhancing Vietnam's ability to interconnect with the world's biggest economies is its prime geographic location. With 3,260 kilometers of coastline facing one of the busiest shipping lanes on the planet, the country is a natural import/export hub.

"The geographic location is important," says Shoeib Choudhury, Country Manager & General Director, DHL Express Vietnam. "It's highly connected to China on the northern side, which makes the supply of raw materials quite easy for manufacturing, and through the North China Sea and Pacific it's also connected to North America."

## Absorbing industry from China

Since at least 2015, Vietnam has also become the beneficiary of some of the drastic economic transitions that China is currently experiencing. Wages in China have been rising rapidly, low-paid manual laborers are becoming harder to find, and the country's economic growth is starting to level off – not to mention the recent start of a trade war with the United States.

"If you're exporting from China to places like America, companies are just jumping, they're biting at the bit to get out and move to places like Vietnam," explains Trent Davies of Dezan Shira & Associates, a pan-Asian foreign direct investment firm. "Vietnam is very lucky in terms of its close proximity to China, but also because it has got these FTAs and its labor costs are low."

Vietnam's minimum wage is currently 60 percent of China's and its manufacturing sector has been

consistently growing at double-digit rates, topping 12 percent in the first three quarters of 2018 – partially due to the sudden influx of companies fleeing China.

This has nearly pushed Vietnam to the limits of its capacity, putting pressure on land access, adequately skilled labor and infrastructure. "We do a lot of work with companies coming from China to Vietnam now, and they're saying that they need warehousing or factory space in an industrial zone, and we're actually struggling to find the space for them," Davies says. "A lot of the industrial zones are filling up very, very quickly."

However, this recent absorption of companies from the north doesn't spell an all-out exodus of China's manufacturing sector. Rather, many companies are employing what's called the "China+1" strategy, where they will carry on their existing operations in China while moving a portion of their production to Vietnam. This allows them to take advantage of what a rapidly emerging Vietnam offers while still maintaining their presence in the world's second largest economy.

## Too much, too quickly?

Vietnam's rapid economic ascent has put extreme pressure on the country's infrastructure network, causing bottlenecks at ports, congestion on highways and delays at airports. On the issue of whether Vietnam's infrastructure is developed enough, Drew Duncan,

**\$223  
BILLION**

Vietnam's GDP in 2018,  
compared to \$6 billion  
30 years ago



## GEAR CHANGE:

There has been dramatic  
growth in new auto  
sales in Vietnam.

Photos: iPhoto/Alamy/Adobe Stock; davidwallphoto/Getty Images



5.7  
PERCENT

The percentage of GDP invested in infrastructure

Managing Director, DHL Supply Chain Vietnam, responds, “No, it’s definitely underdeveloped.”

To alleviate these problems and ensure that its economy can continue growing, Vietnam has been investing heavily in infrastructure – to the tune of 5.7 percent of its GDP – improving railways, highways, seaports and airports across the country. A \$58 billion, 1,545-kilometer high-speed rail line connecting Hanoi with Ho Chi Minh City, Vietnam’s two largest and most important metropolises, is set to begin construction. A significant and long overdue expansion of Ho Chi Minh City’s airport is also currently in the works. Meanwhile, both cities are in the process of installing new metro systems. And there are also ambitious plans to improve Vietnam’s national road network.

#### TECH CENTER

Vietnam is beginning to attract companies from complex sectors such as high-tech industries.



#### Ascending the value chain

Vietnam burst onto the global economic scene by establishing itself as a profitable place to manufacture low-tech consumer goods, textiles and footwear for export, but has recently evolved away from being a monofaceted factory nation. While the country continues to serve as a hub for T-shirt and sneaker production, it is also moving into more complex sectors, cultivating high-end fashion, pharmaceutical, automobile and high-tech industries.

The Vietnamese government has initiated a slate of policies to incentivize investment from foreign tech and pharmaceutical companies looking to move production and establish R&D operations in the country, including free rent, tax breaks, and infrastructural support. And the market responded. Big firms like Samsung, LG, Foxconn



#### PORT OF CALL:

Thanks to its geography, Vietnam is a natural import/export hub.



#### MEN OF STEEL:

There is huge demand in Vietnam for skilled labor, such as construction workers.

and Intel; automobile manufacturers such as Hyundai and Yamaha; and multinationals like Colgate, Palmolive and Pepsi all moved right in, dramatically boosting Vietnam’s position on the industrial value chain.

“In the past, it was all in the field of manufacturing, there was no R&D in Vietnam,” DHL’s Choudhury explains. “Today, many of the big companies are setting up R&D departments here.”

The trickle-down impact of bringing in large multinational tech firms has resulted in vibrant startup scenes around Ho Chi Minh City and Hanoi. The Vietnamese government has encouraged this type of entrepreneurship with several programs devoted to startups, including a big innovation hub in Ho Chi Minh City for fledgling tech companies. According to Davies, this has paid off, and the number of co-working spaces in Hanoi alone has quadrupled in the past couple of years.

“There are a lot of household businesses in Vietnam but people are always looking for new ways to do things better,” Davies explains. “They believe in going out on a limb and starting their own business, they’ve got this ‘go get ‘em’ sort of attitude.”

Vietnam’s ascent up the economic value chain has extended into e-commerce, a sector that, according to Choudhury, is “absolutely thriving.” Many new homegrown Vietnamese companies are now trading internationally via platforms like Alibaba, Amazon, and Lazada, providing an array of new opportunities. Domestic e-commerce has also been on the rise, which is partly attributed to the country’s high smartphone penetration rate.

“People are becoming more and more demanding, so food delivery companies are growing very, very quickly, as are a lot of e-tailers,” says Duncan.

#### Fast-growing middle class

Another consequence of Vietnam’s economic upheaval has been the emergence of a new middle class that is demanding a higher quality of goods and services and has the means to pay for it, creating new opportunities for domestic and foreign companies alike. According to the World Bank, the middle class will rise from 13 percent to 26 percent of the population by 2026. Furthermore, the Boston Consulting Group (BCG) predicts that by 2020, the country’s average per capita income will be around \$3,400 a year.

“We see a lot more cars on the road and you can really see and feel the growing middle class,” Duncan explains. “You read in the papers that it’s the fastest-growing middle class in Asia, but you can actually really see it and feel it on the ground.” ■ Wade Shepard

26  
PERCENT

The forecast percentage of the population that will be middle class by 2026

#### VIETNAM

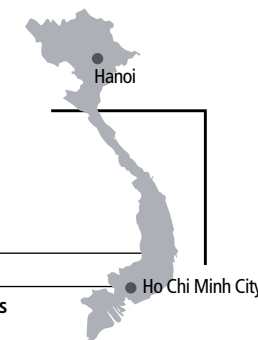
**Population:**  
95.5 million (July 2017 est.)

**GDP:** \$223.9 billion (2017 est.)

**World Economic Forum’s Global Competitiveness Index 2017–2018:** 55th out of 137

**World Bank Group’s Ease of Doing Business Index:** 69th out of 190

**DHL Global Connectedness Index 2018:** 39th out of 169







## 360 DEGREES OF FASHION

Using a special blend of bricks-and-mortar business, social selling and e-commerce innovation, luxury retailer MATCHESFASHION.COM has evolved from a small London boutique into a global success story.

**I**n our era of globalized consumerism, authenticity is key. It's not enough to sell good products, you also have to compel consumers with a narrative, invite them into your community and embrace new technologies without losing your core competencies.

One of the biggest global online luxury retailers, MATCHESFASHION.COM, masters many of these elements. Tom and Ruth Chapman opened their small boutique, Matches, in the London suburb of Wimbledon over 30 years ago. It was the first multibrand store to introduce U.K. shoppers to luxury brands that included Prada and Bottega Veneta. The relaxed pace outside central London allowed the Chapmans to spend more time with customers and develop the personal, service-oriented approach that still marks the company. They also made sure to collect shoppers' names and email addresses, creating a first line of contact for the future.

### A prescient move

Then in 2006, in the midst of a changing retail landscape, the pair launched an e-commerce offering featuring international shipping. The move quickly boosted business, with orders flooding in from Hong Kong, Germany, the U.S. and beyond.

In 2013, the company decided to take digital further and rebranded both the online and offline divisions. The transition took place under the lead of tech entrepreneur Ulric Jerome, who joined the firm that year as COO and is now its CEO. At the time a stranger to the world of fashion, Jerome's high-level experience with online portals for electronics, pet food and gambling made him an unusual choice for the job. Yet his e-commerce know-how powered the firm's rebirth.

After running the business successfully for 30 years, the Chapmans decided to step down and take some time off, so they sold a majority stake in the company to

Apax Partners, which has previously invested in Tommy Hilfiger and Calvin Klein. The 2017 deal reportedly valued the company at \$1 billion and came at the end of an energetic bidding war. The Chapmans retain a minority stake and an advisory role.

The luxury e- and retailer employs 500 people at its headquarters in the London skyscraper The Shard, and a further 600 people at its distribution center.

Online activities now account for 95 percent of sales, and the website receives 100 million visitors a year. Eighty-two percent of orders come from outside the U.K., from the 176 countries that make up the company's customer base. Mobile purchases account for over half their sales.

This move to digital is here to stay for the company and its luxury shopping peers – a recent report from Bain & Company estimates that in 2025, online will influence all luxury purchases, and digital will enable around 50 percent of them. But digital mastery isn't the only move in the playbook of MATCHESFASHION.COM

### Building new stories

In September 2018 the company debuted a five-floor luxury townhouse, 5 Carlos Place, that's part opulent showroom, part events space and part broadcasting house. The move may have raised some eyebrows in an industry where many retailers, including long-established department stores, are literally closing up shop to focus on digital activities, but Jerome sees it as a natural fit. "Let's not forget where we are coming from," he points out, referring to the company's three decades of running stores.

Looking much like a well-heeled private home, 5 Carlos Place aims to unify commerce, culture and community – and as always, curation is key. Events have included installations from fashion designers such as Prada, JW Anderson and Wales Bonner, and guests have included model Kate Moss, Princess Beatrice of York, photographers Mario Sorrenti and David Sims, musician Paloma Faith and actor Robin Wright. Visitors are also welcome to sign up on site to attend masterclasses with Michelin-starred chefs, celebrity nutritionists and skilled florists.

This experience-driven approach doesn't mean that shopping isn't on the agenda, notes Jerome. As he points out, only 10 percent of global luxury purchases are made online today, even though the figure is steadily growing. "5 Carlos Place is an amazing place to make sales as well," he says. "Anyone who comes to 5 Carlos Place can shop all of our products."

That includes offerings by more than 450 designers, from established

names like Alexander McQueen and Givenchy to newer talents, including German designer Horror Vacui and Lebanese jeweler Joelle Kharrat. MATCHESFASHION.COM also has its own label, Raey, for men and women.

A discreet custom experience can be arranged by calling ahead: An expert selection will be prepared in a private suite within 90 minutes. Visitors can also stop off at the top-floor cafe or courtyard garden.

It seems notable that a firm so dedicated to digital has invested in this eye-catching lifestyle destination. Yet, according to Brian Lee, Associate Director at digital-focused business intelligence and research firm Gartner L2, this is not unusual. "Offline experiences like stores may not be necessary to sell a product, but they provide touchpoints for promoting the brand, providing services and acting as a showroom," he says. "Consumers go to stores for experiences, and the MATCHESFASHION.COM multiuse luxury showroom in London will provide valuable opportunities for introducing customers to their newest offerings."

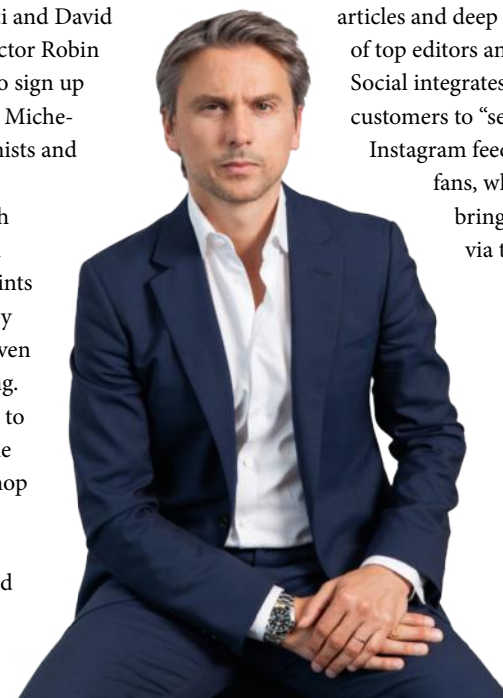
Yet digital is firmly integrated into on-floor activities in the company's retail sites, from the handheld devices used by sales assistants to access online inventory all the way to the QR codes on display, which interact with the MATCHESFASHION.COM app on customers' mobile phones. The latter also personally welcomes them and guides them through their visit, and offers content such as catwalk videos and click-to-shop product pages. 5 Carlos Place also shares its exclusive events through livestreams and podcasts.

### Reaching new territories

The company's online retail portal, app and social media presence all serve to create community, while simultaneously enabling personalization.

MATCHESFASHION.COM's services include a fashion concierge team, MyStylist, offering 24/7 advice via phone or email, and The Style Report, an in-house fashion magazine with exquisite shoots, trend articles and deep dives into the wardrobes of top editors and tastemakers. The Style Social integrates social shopping, allowing customers to "see, share and shop" the Instagram feeds of influencers and fashion fans, while the Shop With... service brings new customers to the page via trendsetters.

**WELL-TAILORED:**  
Ulric Jerome, CEO of  
MATCHESFASHION.COM



Photos: Matches Fashion/Cat Garcia, Matches Fashion

# 450

The number of designers featured on MATCHESFASHION.COM

# 90 MINUTES

The time it takes for MATCHESFASHION.COM to deliver to customers in London. The firm was the first in its sector to offer the service



# 50 PERCENT

The percentage of orders coming from mobile devices

According to Gartner L2's Digital IQ Index: Fashion Global 2018 report, the firm is pretty smart online. It promotes brands on Instagram, the best fit for its followers, as well as in email newsletters. "MATCHES-FASHION.COM is one of the most active retailers on Instagram Stories, posting frequently and utilizing swipe-ups to drive customers to gallery pages for brands," notes Bill Duffy, Gartner L2's Associate Director. Despite its bricks-and-mortar heritage, MATCHES-FASHION.COM scores like a digital native.

### Delivering on the promise of fashion

The evolution from boutique to online retailer has also required setting up a strategy for delivering on the promises of expansion to 176 countries. The company provides a full slate of shipping options with top-flight service. This includes free delivery on orders above a certain amount, premium delivery within London, which allows the customer to pick the date and time for receiving their purchase, as well as the option for standard, express, or next-business-day deliveries. To

**DRESSED FOR SUCCESS:**  
Style from the MATCHES-FASHION.COM Autumn/Winter 2018 Lookbook.



allow for easy cross-border transactions, items are shipped on a delivery-duty-paid basis that is worry-free for consumers.

"We spend a lot of time on the optimization of the supply chain, the optimization of the delivery journey and the user experience around it," explains Jerome. "Reverse logistics is also very important. As an online business, we find that our customers often have to return items that don't fit or don't suit them. The easier we make it for the customers to return unsuitable goods, the more they order." To that end, the firm even offers free returns pick-up in certain markets.

Additionally, in 2016 the company became the first in the luxury retail sector to offer 90-minute delivery to select postcodes in London on its entire catalog, setting a new trend in the sector. "We really believe in making an e-commerce transaction as physical as possible," says Jerome, who regards the initiative as a passion project.

"Ninety-minute delivery service is as close as you can be to a physical experience, because you get your product in an hour and a half," he continues. "The customer is very demanding and on the go, and wants to touch and feel the product all the time. So we were very much looking in terms of on-demand delivery service and the power that it has to change customer behavior."

For Jerome, logistics is simply the backbone of the business. "You can do all the great things in the world, you can have all the best products in the world, you can have all the best teams in the world, but if your last-mile delivery isn't working, you don't have a business," he says. "For us, logistics is a business development opportunity."

MATCHESFASHION.COM's newest focus, curated offerings for home and lifestyle, has been a big hit, though it requires extra care when it comes to delivery. A €3,000 (\$3,500) Gucci Décor porcelain vase or a Murano glass carafe doesn't travel quite as lightly as a Burberry trench or a Fendi clutch. Jerome says the company works closely with each brand so that products come extremely well packaged and protected.

Meanwhile, customers around the world are catered to, but the product selection isn't geographically tailored. "We think our point of view has a global reach," explains Jerome, noting that customers don't want to see what's already available in their market. "In luxury what people want is to experience curiosity, they want to experience discovery." ■ *Susanne Stein*

### FASHION HOUSE:

5 Carlos Place features offerings from more than 450 designers.



**TROUBLED WATERS:**  
Devastating monsoon flooding in Thailand.

## DEALING WITH DISASTER

The rate of natural disasters around the world is increasing. How can companies mitigate the impact to their supply chains when disaster strikes?

**I**f it seems like natural disasters are getting more frequent and causing greater impact, that's because they are.

The world experienced an annual average of 335 weather-related disasters between 2005 and 2014, 14 percent more than in the previous decade and almost double the rate in the decade before that. Natural disasters, such as earthquakes and major weather fronts, caused almost \$1.4 trillion in damage between 2005 and 2014.

Furthermore, rising global temperatures are forecast to cause higher-intensity storms and wetter Asian monsoons going forward. The Intergovernmental Panel on Climate Change estimates that monsoons will increase by 5-15 percent through the end of the 21st century.

And these disasters are having a big impact on businesses, which rely on global supply chains to secure their inbound materials and outbound product flows. Companies need to stay resilient, no matter what hits.

For many businesses, this reality dawned with the 2011 Tohoku Japanese earthquake and tsunami, followed a few months later by monsoon flooding in Thailand. "That was the turning point in supply chain risk management," says Mirko Woitzik, Senior Risk Analyst, DHL Resilience360.

These natural disasters were the first to affect multiple industries at once, he says. They showed companies how vulnerable they were, and spurred the movement toward better supply chain risk management in order to remain agile.

### Multiple supply chain tiers make visibility difficult

Interruption of business, including supply chain disruption, has been the top global risk for five years, according to the Allianz 2017 Risk Barometer, which surveyed more than 1,200 risk experts in 50 countries. Natural disasters and fires are what companies fear most.

# \$1.4 TRILLION

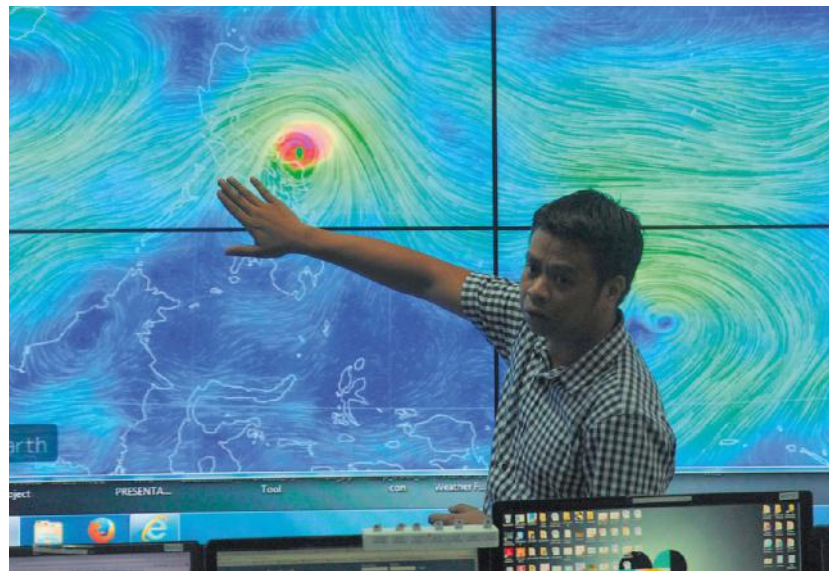
The amount of damage caused globally by natural disasters between 2005-2014



# 4.2 MILLION

The number of vehicles scheduled but not produced due to supply chain issues in the wake of the 2011 Tohoku earthquake

**STORM FRONT:**  
Hurricane monitoring and forecasting in the Philippines.



What's behind so much supply chain disruption? "We now live in a world that I describe as global sequential production systems," says Willy C. Shih, professor of management practice at Harvard Business School. "Intermediate goods are passed oftentimes from supplier to supplier and country to country. Value is added at each step." That complicates the supply chain.

Take semiconductors. They may be fabricated on a wafer in Taiwan, sent to another location for testing and packaging, and then shipped to a distribution center. A manufacturer puts them on circuit boards and ships them elsewhere.

"The biggest challenge for many firms is the visibility of the supply chain," Shih says. A manufacturer or retailer may know their tier 1 supplier, and maybe even their tier 2. "A lot of companies don't know who their more distant tier suppliers are because the world is so complicated," he says. Added to the complex division of labor on so many parts and elements is the fact that lower tiers sometimes subcontract the work without telling the upstream customers.

During disasters, though, the lower-tier suppliers can be the ones most exposed. A prime example comes from the 2011 Japanese earthquake. Semiconductor company Renesas in Japan supplied around 40 percent of the world's automotive microcontrollers at that time. Some automakers had to shut down due to damage to the Naka fabrication facility, which was the sole source of engine controllers for some of their vehicles.

In another example, Merck Chemicals is the only producer of Xirallic, a specialized pigment used to make auto paints shiny. After the earthquake, at least eight automakers couldn't source it. In fact, the impact of the earthquake on auto components overall led to an estimated global production shortfall of 4.2 million

vehicles, half of which were slated for production in Japan. According to Shih: "This example shows that multiple tier 1 suppliers may have a common source for a critical component in the supply chain several tiers down without knowing it."

## Advanced warning can make a difference

Disasters like hurricanes and snowstorms often allow for advanced warning; companies can proactively re-route supplies to other ports or roads, stock up on parts for production and communicate with clients and vendors. Prior to Hurricane Florence in September 2018, for example, Boeing moved some Dreamliner airplanes from South Carolina to Washington to avoid damage.

As hurricanes are common in certain areas each year, monitoring and forecasting should be part of the normal process for companies operating there. Earthquakes, on the other hand, can strike at any moment. There's no time to prepare for them, although certain spots in the world are more prone to them. Still, in a 2015 Supply Chain Management World Future of Supply Chain survey, only 12 percent of automotive respondents said that earthquakes were a major concern for them.

## Planning for disaster

Formulating a backup or continuity plan long before disaster strikes is a good way to ensure minimal supply chain disruption. "I advocate that companies do an assessment of what those risks are and create disaster risk profiles for each supplier," says Archie Lockamy III, a professor of business at Samford University. That requires visibility into the supply chain and an understanding of risks and their probability.

He also recommends using the assessment to measure the revenue risk exposure of the company's supply chain. "Is the risk such that you have to either terminate your relationship with that supplier and find an alternative, or work with that supplier and find ways to mitigate that?"

If certain suppliers are in earthquake zones, the risks should be examined, says Woitzik. Companies should consider data from the last 100 years, not just the last two or three, and then choose suppliers based on the level of risk exposure. For example, Taiwan and Japan are in the Ring of Fire, yet the risk of an earthquake in one part of Taiwan is greater than another. That can help determine where to place a warehouse or which supplier to choose. Companies can use databases and heat maps, for example in a tool like DHL's Resilience360, to understand risk profiles for specific companies and regions. This provides greater visibility into the supply chain tiers and interdependency between locations.

When selecting suppliers, companies can allocate orders based on the supplier's level of risk. "I wouldn't give 80 percent of my business to a highly risky



**AFTERSHOCK:**  
Shipping containers washed up by a wave caused by an earthquake in Chile.

supplier," says Lockamy, adding that the decision must be balanced by any alternative supplier's ability to provide the necessary level of quality and service.

If manufacturing garments, it may not be difficult or expensive to find capacity in other countries or regions. However, in some parts of the electronics industry, only one to three sources worldwide manufacture specific products.

The downside of adding redundant suppliers is the expense, which might involve duplicating set-up costs for an alternate producer. Specialized tooling is time-consuming to produce. "If you want spare capacity, it costs you money and goes into the product cost," Shih says. Using a single-source vendor is less expensive and a tradeoff companies often make, however risky.

Meanwhile, changing suppliers right after a disaster may also require additional time. It is imperative to look at critical components and their lead time for production or specialized tooling. The company should understand their strategy for handling interruptions in advance.

Suppliers also need to consider a natural disaster plan in order to protect their customers and their outbound product flow. A Novo Nordisk factory outside of Copenhagen, for example, makes nearly half the world's supply of insulin at one location. "That's scary. If something happens to that factory, a lot of people are dependent on it," Shih says. However, for many years, the pharmaceutical company has stored a multiple-year supply in case of emergency. For the past two years, they've also been expanding production of their diabe-

tes products at a North Carolina site. "They understand the criticality of the supply world," Shih remarks.

## Maintaining visibility and monitoring risk

Visibility into the supply chain is usually easier for small companies as they have fewer suppliers compared to an organization with, say, 10,000 global suppliers. "We see a much larger push to drive toward risk management tools for automating things with large companies, where it's hard to keep track of everything around the world on a daily basis on all continents," says Woitzik.

DHL's Resilience360 is one example of the new tools being developed to analyze the risks and probabilities of natural disasters in the supply chain. Whether due to a natural disaster or just some debris causing a traffic jam, visibility tools allow users to see specific transportation and supplier information and can enable them to quickly reroute a shipment or assess a supplier's risk exposure.

"You can simply look at your supply chain locations in a hurricane's path, for example, to allocate resources more efficiently and effectively depending on which suppliers or distribution centers are in the area," Woitzik says. With near real-time global monitoring of incidents capable of disrupting supply chains, cloud-based platforms can help companies reduce risk and stay agile.

"If we understand the risk and can plan for the risk in advance," says Lockamy, "we should be in a better position to respond." ■ Deborah Kaplan

# 12 PERCENT

The percentage of automotive respondents who said earthquakes were a major concern

Photos: Jay Directo/AP/Getty Images; Jose Luis Saavedra/Reuters





A GIANT JOURNEY

The oversized 140-metric-ton waste heat boiler pictured here is one of four that were transported over 4,800 kilometers (3,000 miles) from Germany to Saudi Arabia. This mammoth project made its journey by land, sea and air, requiring the strength of the Antonov AN-255, the world’s largest cargo aircraft, along with a barge, a 1,000-metric-ton crane and a 275-metric-ton heavy goods transporter with 20 axles. This heavy-duty multimodal movement was managed by DHL Industrial Projects in four transports with an interval of some two to four weeks, each taking about seven days.


 [bit.ly/dhl-giant-journey](https://bit.ly/dhl-giant-journey)

Photo: DHL

ANTONOV AN-255:

Wingspan:	290 feet
Length:	275 feet
Height:	59 feet

WASTE HEAT BOILER:

Height:	12 feet
Width:	13 feet
Length:	62 feet



# THE MINDFULNESS REVOLUTION

These days, mindfulness is practiced in many workplaces. Companies around the world are increasingly convinced that the practice is also good for leaders – as well as for the entire business.

**J**ames Barlow, an accomplished executive who developed and implemented PepsiCo Europe's sustainability strategy, says he spent much of his life feeling edgy and needing to prove himself, even though he had a classical academic upbringing, went to the University of Cambridge and had been labeled "clever."

While studying for a master's degree, one of his professors questioned the idea of "I think, therefore I am," and Barlow began learning about and practicing mindfulness. Instead of being constantly driven by and caught up in his thoughts, he started to focus on the here, the now, his breath and his experience. Looking back, Barlow says many of his accomplishments at PepsiCo were linked to his journey with mindfulness.

"Mindfulness has caused my leadership style to soften and be inclusive; I am more able, more often, to welcome people into dialogue, showing how prepared I am to understand others' perspectives rather than just quickly getting to my point," says Barlow.

Indeed, the way a leader interacts with people and generally comes across has a strong impact on employee engagement.

## Real and measurable benefits

According to research by Gallup carried out over two decades in 195 countries, managers account for at least 70 percent of the variance in employee engagement – e.g. through the manager's engagement, behaviors as observed by team members and the manager's natural talents.

Louise Cox Chester is Managing Director of the U.K. division of the Potential Project, which provides leadership and organizational effectiveness solutions based on mindfulness. She says there is a global movement to make corporations more people-centric as a way to achieve better results.

"Our research has shown that when leaders are mindful – i.e. both self-aware and aware of others – they also become more selfless and compassionate," she

says. For instance, they do not let egoistical impulses rule, but see the bigger picture, or they have the intent to be of benefit to others. This helps them enable a more people-centric leadership style, which then sets the tone or culture for the organization.

"The benefits of mindfulness to executives, employees and companies are real and measurable. Full presence enables leaders to make good decisions and forge trusting relationships," says Chester, who was a contributor to the research for "The Mind of the Leader," released in 2018 by Harvard Business Publishing.

Indeed, many companies are recognizing the benefits of mindfulness training as meditation becomes less associated with spirituality and more with neuroscience, it's becoming more accepted as a practice for the workplace.

Health insurer Aetna and General Mills were among those companies that had programs early on, after Jon Kabat-Zinn, professor emeritus of the University of Massachusetts Medical School, coined the term mindfulness and launched a wave of scientific research into its benefits. The list goes on: Goldman Sachs, Apple, Google and SAP all have programs.

Cloud computing company Salesforce opened meditation rooms on every floor of its San Francisco corporate office in 2016. And at fashion company Eileen Fisher, the company founder begins each meeting by holding a minute of silence. There are now even meditation sessions at the World Economic Forum summits at Davos.

The benefits to businesses are clear: Aetna, for example, reported that employees' annual productivity rose by about \$3,000 per person after they participated in a mindfulness training program.

And those benefits can be just as apparent when it comes to leadership.

In her role at the Potential Project, Chester recently implemented a program with the board of a financial services company in London, based on the idea that leadership starts in the minds of individuals. "Awareness of how we show up is the starting point. To lead effectively, we need awareness of self first, as well as our values, motivations and behaviors. Then we can engage



with those we lead and the whole organization with full awareness."

## Less distracted, more focused

As part of the program, the board began to practice mindfulness together. "At the start of meetings, they now do a short practice to ensure everyone can let go of their previous mental activity and be present – not just with their bodies but with their minds as well. They wanted to make sure they could give each other their full attention," Chester says.

The executives reported back to Chester that they were sleeping better, felt less distracted, more focused on priorities and less reactive.

Angela Negro, a leadership coach, had a similar experience with managers in a development program for high-potential employees at an aerospace company in France.

In this case, the managers were blocked and frustrated about a project that would be due shortly. They also began blaming each other for the impasse. Negro encouraged the managers to begin noticing their thoughts and behavior without judging, and then bring

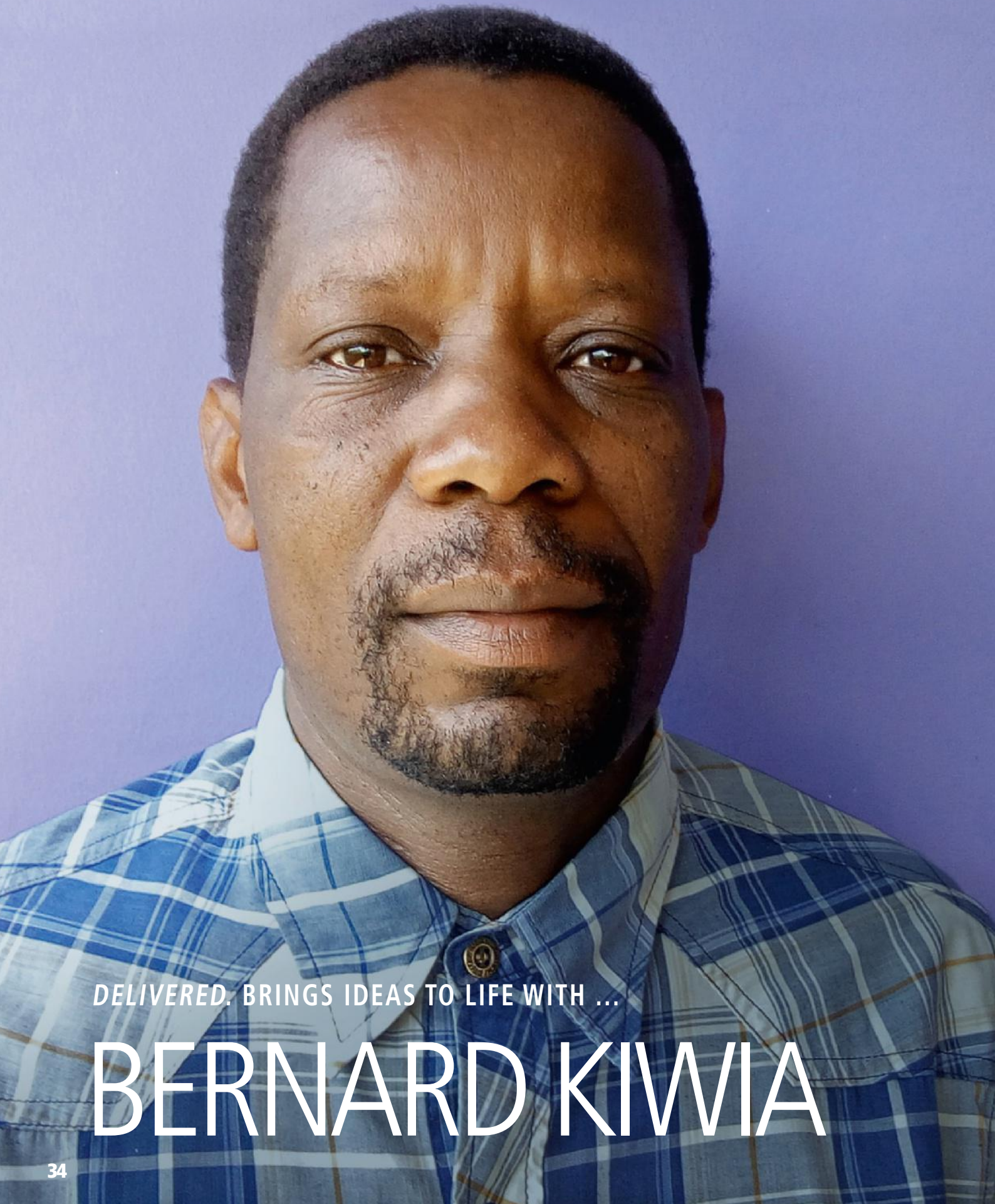
that insight back into the discussion. She asked them to observe if they were acting as the hero, the villain or the victim in that situation.

Within the space of two hours, the group found a new way of working together and renewed enthusiasm, Negro says. "The project was going ahead, they restructured their roles, relaxed and found new confidence. They had an opening by allowing themselves to recognize what was going on in their minds and how that related to them, as well as the effect it was having on the overall group dynamic."

Teaching mindfulness techniques is only one part of Negro's coaching practice, but one she favors over other techniques that are mostly cerebral. "Decisions are made from our head, but mindfulness connects us more to our heart and gives us access to more information to make better choices," she says.

"Mindfulness is becoming a buzzword because people see that it creates trust, and organizations that have trust have better employee engagement and then make more money. It's good for bottom-line profits," says Negro. "Even if profit is driving it, mindfulness is still a great thing." ■ Rhea Wessel





DELIVERED. BRINGS IDEAS TO LIFE WITH ...

# BERNARD KIWIA

To help Africa become a hub for innovation, a Tanzanian inventor has started a design and technology school where local people learn how to come up with sustainable solutions that will simplify their lives.

**W**hen he was 16 years old, Bernard Kiwia designed and built his own film projector using local materials. “That was the first thing I ever made,” he remembers. “I like finding out how technology operates – and I like to have an idea and then try to make it work.”

Kiwia has now turned his passion for creation into a full-time job as the Director of Technology for Twende, a non-profit organization and school for innovation in Arusha, northern Tanzania, which provides local people with space, tools and technical advice. In his workshop Kiwia has helped hundreds of secondary school students, smallholder farmers and microentrepreneurs to design and make practical products from local materials.

For example, through Twende, local businessman Frank Mollel invented the Fert-Cart, an adapted wheelbarrow that works as a manure spreader; and Jesse Oljange created an avocado oil press and then set up a company to help farmers produce high-value avocado oil for food and cosmetics. In 2014, Twende ran a series of workshops that culminated in the International Development Design Summit, which brought together 46 participants from 21 countries to create technologies in four rural communities in northern Tanzania. In just four weeks, the teams designed and made eight prototypes.

In short, Kiwia is helping turn ordinary people into problem solvers. Even for people with good design ideas, it can be difficult to become innovators and make prototypes because they may lack the practical knowledge to do so, he says.

Kiwia also works on his own designs, such as a drip irrigation kit (made out of crop bags, pipes and sheets of plastic) and a bicycle-powered maize sheller. “When you shell maize by hand, it takes a long time and it also hurts your fingers,” he explains. “So the aim here is to simplify people’s lives.”

Bicycles have always been important to Kiwia. Back in 2007, he was working as a bicycle repairman when he was given the opportunity to visit an International Development Design Summit at the Massachusetts Institute of Technology in the U.S. It was there he realized he could use bicycles to create inventions, and once back home he designed a pedal-powered cell phone charger and a water pump.

In 2012 he founded AISE! (Swahili for “Wow!”), an organization that runs design and innovation workshops for local people. Then in 2015, he joined forces with mechanical engineer and Twende cofounder Jim

Elsworth. Kiwia is now in the process of developing a second design and innovation workshop.

Kiwia’s message is simple: Everyone has the ability to innovate. “Take a look at the things you have around your house – some use really simple technology. People think they need special skills to make their own products. But, really, all they need to do is try.”

**Why do you want to teach people the skills to make their own technologies?**

Technologies that come from abroad don’t always work well in our community and repairs can be difficult. When local people make their own products from local materials, they often work better.

**Do any of the inventions at Twende use electrical power?**

We are trying as much as possible not to use electrical power. Everyone is interested in clean energy these days, so if we can make something that’s powered by wind or sun and doesn’t use electricity or fuel, then that’s my preference.

**Are you personally interested in green technology?**

Yes. My family has been off the grid for almost six years now, and everything works very well. In our house we use solar panels, pedal-powered water pumps, a wind-powered washing machine and a solar-powered cooking stove. Twende students are able to visit our home to see this technology at work.

**What challenges do you face when helping people turn their ideas into reality?**

We first have to discuss if the technology they want to produce is safe and not against the law. We don’t allow people to make guns at Twende, for instance. Also, what will it cost? Ultimately, we don’t want to spend too much money on a design, particularly if it’s the first time it’s being made.

**What challenges do people face when they visit your workshop?**

For schoolchildren there’s not a challenge as such because they come here as part of their educational development. The problem for adults, though, is time. They need to work to provide for their families so it’s a commitment for them to attend courses at Twende. However, we work with organizations that support them while they do their training.

**What have been some of your favorite Twende innovations?**

Agricultural technologies, such as rice-threshing machines or the maize sheller. Most people in the community depend on agriculture, either to produce food for their families or to sell. So if we can make technology that will help agricultural production, then we are helping local families. For me, that’s a very powerful motivation. ■ Tony Greenway

## 800

The number of local innovators that have used Twende services

## 100+

The number of inventions that have sprung from the Twende workshop



# THE WORLD AT ITS BEST

In a time when nationalism and protectionism are on the rise, companies need to step up in order to effect positive change in the world.



## AN ESSAY BY KEN ALLEN

Ken Allen has been a member of the Board of Management at Deutsche Post AG since February 2009 and CEO of DHL eCommerce Solutions since January 2019, prior to which he was CEO of DHL Express.

**R**ecently I had the opportunity to attend a football tournament like no other. It wasn't the FIFA World Cup or the Champions League, featuring the likes of world-famous players such as Messi and Ronaldo. Quite the opposite, in fact. All the players were DHL Express employees from across the Middle East and Africa who had come together to compete in a company competition. The atmosphere was electric. There was a cheering crowd, some nimble footwork, and some great saves and goals. But to all intents and purposes it was an ordinary company event.

And yet it wasn't ordinary at all. Indeed, I wish some of the world's politicians had attended these games. They would have seen Saudis, Afghans, Syrians, Egyptians, Iranians and many other nationalities all playing together and celebrating as one family. And they

wouldn't just have seen men playing football, either. In a region that's generally thought to have a long way to go when it comes to promoting gender equality, female teams were also competing. They included players from Iran, Egypt, Syria, Kuwait, and even an all women's football team from Saudi Arabia – something I never thought I would see in my lifetime.

## Corporate culture and the wider world

Watching these teams of bright and passionate people compete on the football field got me thinking about our own company's culture and the role of corporate cultures in the wider world.

Many pieces on leadership offer theories about how corporate culture influences employee engagement and also a company's bottom line. My theory is rather wider, however, and it's this: Corporate culture influences the world. Quite simply, if large com-

panies like ours succeed in positively engaging and empowering their global employee base, then I'm convinced that, like ripples on water, positivity will flow outwards and effect positive change.

At DHL our tagline is "Excellence. Simply Delivered." Actually, it's not just a tagline – we truly live it. We want DHL to be the best in the world when it comes to connecting people and improving lives and, to that end, we have made significant investments to ensure all employees receive training about our core business and purpose. By now, most of the 500,000-plus employees across the DPDHL Group are already carrying a small passport to prove they have completed this training. I carry my passport wherever I go, and on my travels, even when walking around cities as a tourist, I have met couriers and showed them my passport. In response, they have proudly done the same.

## No boundaries

As the most global company in the world, we truly do not see nationality, color, religion, sexual orientation or education. We are all family, we all carry the same passport, we care about the same things. At the same time, we encourage everyone to go out there and engage with the world. Yes, that means putting our customers first and foremost, as without our customers we would be nothing. But our people also truly care for others, for people in need and for the environment – and we actively encourage and support them to do so.

For example, DPDHL colleagues from around the world volunteer to be part of our Disaster Response teams, helping to manage logistics flows in the aftermaths of major disasters like the recent earthquake in Indonesia or the devastating hurricanes Irma and Maria in the Caribbean. Some 100,000 colleagues across the globe engage with our global volunteer day each year, doing everything from cleaning up beaches to building entire houses. At the start of last year we also began recognizing and rewarding employees who volunteer for good causes in their spare time. At a big annual management meeting, six regional finalists of our DHL's Got Heart campaign told us their stories. People like Diego, who works with troubled youths in Costa Rica, Truc Thanh, who helps children with cancer, and Quinto, who set up his own foundation to help kids traumatized by war in Uganda – all of them are representative of the admirable and inspiring work done by many others across the company. They also represent the spirit of DHL, and of the kind of people we have always aimed to recruit and foster: people with passion and purpose, committed to our customers and the wider world. During these guys' presentations, I'm sure

many senior managers had a tear in their eyes as they listened to the incredible stories of how these amazing human beings spend their free time selflessly helping others, and of those who need that helping hand.

## The world at its best

I've been with our company for 33 years, and I truly mean it when I say we want DPDHL to be an example of the world at its best. So back on that football field, watching all those passionate young women and men competing and cheering each other on, no matter where they were from or what relationship (or conflict) their respective countries had, I really felt we had achieved that aim. When we're at work, we are the world at its best. And it doesn't stop in one region – we hold these types of events and have that spirit at work across all parts of the world.

It's more important now than ever. In times when some governments are increasingly nationalistic, where some abdicate responsibility to fight climate change, and where wars are waged for territorial or ideological gains, I believe companies – especially large ones – have an ever more critical role to play in society.

Our purpose at DHL is to connect people and improve their lives. We believe that isolation is not a solution, and that we have to encourage more interaction and build stronger bonds that can be a win-win for our customers, for international trade and for all our people.

We have the means to support our people in their development and engagement. And we have the will to help tackle climate change and – with the support of our employees – create fresh ideas, innovative solutions and initiatives that can truly make a difference on all levels. I firmly believe that at a time when our planet is in peril through environmental problems, when people are suffering because of wars and famine, and when protectionist sentiment is rising, we all have a responsibility to do more.

It's not just an issue for our company, of course. There are many other global and mid-size players who also have to step up and take on this challenge. If all of us make the effort, and if our passionate and empowered people go out into the world to motivate their families, their communities and beyond, then I firmly believe that we can effect positive change and achieve great things. As simplistic as it may sound, person by person we can move forward together and make this world a better place.

I think Mother Teresa said it best. "I alone cannot change the world," she noted "But I can cast a stone across the water and create many ripples." ■



## WHAT'S THE STORY, MR. THOMAS?

# WE HAVE THE POWER

Aaron Thomas and Denny Hulme are the cofounders of an industry first: a solar-charging innovation for trucks that saves fuel and reduces vehicle emissions.



**S**ometimes the simplest ideas are the best. Since 2016, my colleague Denny and I have been working on a product called TRAILAR – ultrathin solar matting fitted to the roof of small, medium and large rigid trucks and trailers. This invention has the power to revolutionize the transport industry because the natural energy the mats harvest helps charge

a vehicle's battery and can be used to run various on-board activities such as air conditioning and tail lifts. This reduces the need to run the truck's engine, which, in turn, improves fuel consumption and lowers vehicle emissions. It's a win-win.

The product had an unusual beginning. Denny and I worked for DHL Supply Chain in the U.K. We met during a management development program where we were asked to come up with an idea that would disrupt the U.K. transport industry. We wondered if it would be possible

to integrate solar technology with heavy goods vehicles, although we knew it had been tried before without success using the type of panels installed on domestic roofs. We talked to leading U.K. universities and a commercial vehicle manufacturer about developing a smaller, smarter solution and presented it to the CEO of DHL Supply Chain in the U.K.

I'm pleased to say the result was a big success – and an industry first. We had excellent feedback from the transport sector and great support from DHL and, after a trial, began developing TRAILAR as a product we could take to market. At first, we did this alongside our day jobs. We then made it into Deutsche Post DHL Group's "Start-up Lab", the company's incubator program, in early 2018. Meanwhile, we've started full-time roles at TRAILAR. The Group gave us the green light to install TRAILAR on its vehicles, so we've begun rolling that out, starting with the U.K. It's also available for any rigid vehicle, anywhere in the world.

TRAILAR ties in well with DHL's GoGreen program and contributes toward the company's goal of becoming the zero-emissions logistics leader by 2050. It's been shortlisted for various industry awards; and we are one of 10 start-ups in the 2018 Climate KIC Accelerator, the world's largest green business ideas competition and accelerator program.

It's been an incredibly exciting three years. But really, we're only getting started: With our growing team, we'll give it everything we've got to get TRAILAR on the road – on trucks, trailers and even more vehicle types around the world! ■ *As told to Tony Greenway*



[www.trailar.co.uk](http://www.trailar.co.uk)



**FACT:** TRAILAR generates a return on investment after approximately 12-15 months

# 3mm

The thickness of the solar matting installed on a truck's roof

# 5%

The approximate estimated fuel savings offered by the TRAILAR solution

# 1969

The year when Larry Hillblom, Adrian Dalsey and Robert Lynn founded the world's first express courier company, DHL. Hillblom and Dalsey started out flying themselves as couriers, transporting bills of lading for their first customer, Seatrain Lines, between Honolulu and Los Angeles. They were later joined by Lynn. Using a shared Plymouth Duster, the team drove around San Francisco picking up documents in a suitcase, then rushing to the airport to book flights. As DHL Express enters its 50th year, the company has become the most global in the world, providing services to companies all over the planet and delivering to more than 220 countries and territories.



# MUSIC THAT MOVES YOU. ANDRIS NELSONS' PLAYLIST.

DHL, the Official Logistics Partner to the Gewandhausorchester proudly presents 'Soundtrack to your Moments'. A Spotify playlist curated by Gewandhauskapellmeister Andris Nelsons from his top picks and personal Gewandhausorchester favourites. Music to keep with you for all your little moments of joy.

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