



Delivered.

THE GLOBAL LOGISTICS MAGAZINE

ISSUE 03/2016

BUSINESS

BRINGING JOBS HOME

After years of offshoring, U.S. firms are bringing some manufacturing back to the States

SOLUTIONS

ON THE RADAR

The latest trends, from the Internet of Things to 3-D printing

VIEWPOINTS

SPACE ODYSSEY

Astronaut Reinhold Ewald on the challenges of space logistics

FOCUS

PRESCRIPTION FOR PROFITS

How mergers and acquisitions are proving a quick route to profits for Big Pharma





DEAR READER,

Join us on a journey around the globe. In Iran, sanctions are just being relaxed, opening up opportunities in many sectors. In the U.S., manufacturing is making a comeback. And for many global economies the storm clouds appear to be lifting. In this issue we explore all of these topics, looking at what global businesses can do to be optimally prepared and thrive. We are very pleased to feature insights on business and logistics from a key player in the life sciences and healthcare space, Johnson & Johnson, where Katherine Ross and her colleague Dorcas Patterson took time out of their busy schedules to talk to us.

Follow us into space with Reinhold Ewald, one of the astronauts on the European Space Agency's first long-duration mission to the International Space Station, who has some fascinating tales.

Since we started publishing *Delivered.*, three years ago, we have received quite a number of awards. The latest accolades are a gold and silver Communicators Award and an Astrid Award. With a total of eight awards under our belt now, plus some fantastic feedback from you, our Customers and readers, we know we're on the right track – delivering an array of articles, viewpoints and insights five times a year that add value to you and your business. Your feedback on *Delivered.* is important to us and will be gratefully received. bill.meahl@dhl.com

Enjoy your read!

Sincerely,

Bill Meahl
Chief Commercial Officer, DHL

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www.delivered.dhl.com



NEWS



PUBLIC-PRIVATE PARTNERSHIPS – BETTER TOGETHER

In recent years, a growing number of private sector companies have been partnering with the United Nations in an effort to jointly solve some of the world's most pressing societal problems and tackle emergencies. A new publication – itself a collaboration between Deutsche Post DHL Group and the U.N. – shows why these and other public-private partnerships are important and illustrates how they work in practice. Titled "Combining Capabilities: How Public-Private Partnerships are Making a Difference in Humanitarian Action," the report highlights a notable example: Deutsche Post DHL Group's successful disaster management program GoHelp, established in cooperation with the United Nations Office for the Coordination of Humanitarian Affairs and the United Nations Development Programme a decade ago. This is a partnership that helps train airports and personnel in disaster preparedness and provides support to ensure better logistics management at airports in disaster-hit areas. The Group provides the U.N. with access to its core competence in logistics, its global network and its employees' know-how on a free-of-charge basis – and the U.N. mandates it with access to the international relief and development community. The report also features expert perspectives and showcases many other successful partnership models from all over the world. With thought leadership, solid insights and expert advice, the report aims to underline the benefits for companies and what they can do to engage effectively in public-private partnerships that deliver social value. **To download the report, please visit:**



www.dpdhl.com/ppp



WIN!

Sharpen your skills and learn from the best. We have a stack of best-selling books up for grabs, all recommended by business and thought leaders we interviewed in *Delivered*. The selection includes classics such as "The Art of War" by Sun Tzu and current editions such as "Abundance: The Future is Better Than You Think" by Peter H. Diamandis and Steven Kotler; "Dynamic Supply Chains" by John Gattorna; and "Lean In" by Cheryl Sandberg. See the full list of books you could win here:

tinyurl.com/delivered-book

To be in with a chance of winning all 15 books, all you have to do is drop us an email at delivered.magazine@dhl.com and share the name of your favorite business book, entering "Business books competition" as the subject line.

Be sure to include your postal address in the email so we can deliver your prize if you win. Good luck!



tinyurl.com/delivered-book

NOW THAT'S AIR MAIL!

Josef Eisgruber is a high-flying DPDHL employee – in a very literal sense. Known as the "Flying Postman," he's a keen paraglider in his spare time, and his canopy features the distinctive yellow color – what else?



NEW LIFE SCIENCE COMPETENCE CENTER IN HOLLAND

DHL has opened a new logistics center for life science and healthcare products at Amsterdam Airport Schiphol. The \$1.1million (€1 million) Life Science Competence Center – one of the largest and most modern of its kind in the transport sector in the Netherlands – serves as a hub for the transport, transport preparation, temporary storage and transport follow-up of active and passive temperature-controlled pharmaceutical and medical products. It is also certified as part of the company's network of DHL ThermoNet stations, the solution that manages temperature-sensitive air freight shipments along the supply chain. "With its strategic location at Amsterdam Airport Schiphol, this new competence center further strengthens our existing temperature-controlled network worldwide," says Nigel Wing, Global Head Life Sciences & Healthcare, DHL Global Forwarding.

PARCELCOPTER TRIAL DELIVERS RESULTS

DHL has successfully completed a world first: a three-month trial to integrate its Parcelcopter parcel drone into the delivery chain in Reit im Winkl, Bavaria, Germany. The Parcelcopter – which had its cargo loaded and unloaded automatically via a specially developed Packstation – carried out autonomous flights in challenging Alpine conditions at roughly 1,200 meters (0.7 miles) above sea level.



tinyurl.com/parcel-copter



CLEAR CHALLENGE FOR DHL

The DHL Global Forwarding Automotive Team in Cologne handled a very special shipment for its automotive component customer Mubea. The challenge: the safe transport of a perspex showcar to the U.S. where it will be presented during an inhouse exhibition. Due to the very demanding material quality of the car, the cargo had to be transported with special care. The shipment – with an overall volume of more than 100 cubic meters – consisted of many boxes, which had been equipped with DHL SmartSensors. These sensors record different data including vibration and temperature and the sensitive cargo can be tracked online at any time.

AWARDS. SIMPLY DELIVERED

DHL's global customer magazine *Delivered.* continues to garner accolades. At the 22nd Annual Communicator Awards it won a Gold Award of Excellence for Overall Design (for issue 1/2015) and an Award of Distinction in the Magazine Industry category. The magazine also received an Honors at the 2016 Astrid Awards in the Business-to-Business category.

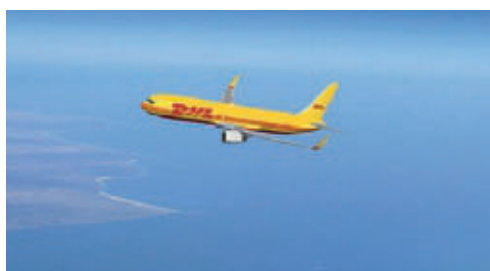


tinyurl.com/delivered-awards



FLYING DOWN TO MOROCCO

DHL Express Morocco has launched a direct daily flight between DHL's global hub in Leipzig and Tangier's Ibn Battouta Airport, connecting northern Morocco's high-growth economic zones to Europe. The new service, flying a 15-ton capacity Boeing 737 via Alicante in Spain, cuts delivery times by four hours and extends pickup limits by three hours. It is DHL's third dedicated air service to Morocco, joining the two six-times-a-week flights from Casablanca to Charles de Gaulle Airport in Paris. Government investment in Tangier in a wide range of industries, from automotive to textiles, means that northern Morocco is experiencing huge economic growth, with DHL seeing a double-digit increase in trade. Nour Suliman, DHL Express Middle East and North Africa chief, said: "The new connection from Tangier reinforces our commitment not just to Morocco's fast-growing industry clusters, but to a growing number of businesses across the Maghreb using Morocco as a strategic gateway into European markets."



THE STORY



WIN!

DHL was once again part of the international Fashion Weeks scene, with dedicated teams working behind the scenes to ensure that precious gowns and fabulous accessories reached their destinations in time for show time across the globe.

As part of the DHL Exported program, four talented designers are offered the opportunity to grow their business into new fashion markets around the world. Marcel Ostertag, Sid Neigum, Atsushi Nakashima and Anne Sofie Madsen had their first round of DHL Exported shows in February and March and will be given a fully produced runway show again in September and October at which to present their Spring/Summer 17 collections. The respective collections are exported by DHL and will travel a total of over 30,000 kilometers by land and air. Follow their journey on @dhlexported.

We're delighted to bring a little stylish fashion glamour to the 10 *Delivered.* readers who are lucky enough to win an exclusive Mercedes-Benz Fashion Week bag by Bree, filled with a delightful selection of fashionable goodies.

To win, simply send an email entitled

**DHL Exported@ Fashion Week to
delivered.magazine@dhl.com**



www.dhlexported.com



\$2 TRILLION

The estimated value of Saudi Arabia's state oil company, Saudi Arabian American Oil Company, ahead of a sale of less than 5 percent of it through an IPO (initial public offering)

25

The global rank in the Logistics Performance Index that Saudi Arabia wants to achieve as part of the Kingdom's Vision 2030 strategy (up 24 places from its current 49th position)

• Riyadh

• Dammam

• Jeddah

50%

The share of non-oil exports in non-oil GDP that Saudi Arabia wants to reach as part of the Kingdom's Vision 2030 strategy (up from currently 16 percent) www.saudi.gov.sa

Red Sea

COOL CUSTOMER

Danzas – DHL's Global Forward division in the United Arab Emirates – is expanding its Life Sciences and Healthcare capabilities in the Middle East with a cold store extension within its existing facility in Dubai's Jebel Ali Free Zone. The facility is close to both the Dubai South development, Al Maktoum International Airport and Jebel Ali Port. It will feature a state-of-the-art cold storage setup (2-8 degrees Celsius) with double-secured power outage and alarm systems, pest control and a 220-pallet capacity. This is embedded into a 5,500-pallet-capacity ambient storage area. Danzas Dubai is ISO 13485 accredited, and the Life Sciences facility with cold chain capability will soon be Silver Graded according to DHL's own specification for LSH facilities.



STREETSCOOTER: POWER STEERING

Deutsche Post DHL Group is working towards achieving its climate change target of improving carbon emissions by 30 percent in the next four years (by 2020). One of the ways this is being achieved is to use environmentally

friendly vehicles such as the Group's individual StreetScooter, an innovative electric van specially designed for mail and parcel delivery. Developed by the Group together with StreetScooter GmbH and RWTH Aachen University, the first 500 StreetScooters were put into service in Germany and the Netherlands in 2015. By the end of this year, a further 2,000 vehicles will have been produced. Reaching speeds of up to 50 miles per hour (80 km/h), the StreetScooter – which has a maximum range of 50 miles (80 km) – is ideal for CO₂-neutral deliveries in rural areas as well as in smaller and medium-sized cities.



tinyurl.com/emission-free

KEEPING FREIGHT SEAWORTHY

DHL has launched DHL Ocean Thermonet, a product specially tailored to the Life Sciences and Healthcare sector, to address the pharma industry's growing demand for ocean freight solutions. DHL Ocean Thermonet enables round-the-clock monitoring, via an app, of temperature-sensitive pharmaceutical products and the possibility to intervene at short notice in case of incidents, thereby ensuring cargo safety and integrity. "Based on an increasing demand from customers, we are now extending our Thermonet offering with DHL Ocean Thermonet, addressing the need for transparent, compliant, consistent and reliable temperature-controlled ocean transportation in the Life Sciences industry," says Nigel Wing, Global Head Life Sciences & Healthcare, DHL Global Forwarding.



LIVING RESPONSIBILITY



EARTHQUAKE IN ECUADOR

In April, a powerful 7.8-magnitude earthquake hit Ecuador, centered approximately 105 miles (170 kilometers) northwest of the capital, Quito. Felt across Ecuador, northern Peru and southern Colombia, it left at least 270 people dead and more than 2,500 injured. Thousands of people have been left homeless, with no access to food, water or medical supplies. Deutsche Post DHL Group immediately sent a Disaster Response Team (DRT) – part of its GoHelp disaster management program, established in cooperation with the UN Office for the Coordination of Humanitarian Affairs – to assist with logistics efforts at the country's

Eloy Alfaro International Airport in Manta. "When a natural disaster strikes, a rapid response is needed to get vital relief supplies to people in need," says Gilberto Castro, Manager of DHL's DRT Americas team. "Efficient handling of incoming aid by professionals is key. This is where our DRT teams come in. Using their logistics expertise, they provide practical, effective support at airports to ensure fast, well-organized handling of all kinds of incoming aid supplies – from food and water, to emergency housing."



tinyurl.com/DRT-Ecuador

WIN!



Speed, precision, passion – these are important characteristics for succeeding in motorsports. As Official Logistics Partner to some of the leading motorsports on the planet, DHL knows that they are equally important for the logistics race behind the race. Soon you could be experiencing for yourself the excitement of the World Touring Car Championship!

All you have to do is answer one easy question, and if your name is pulled out of the hat you could find yourself watching your favorite drivers going bumper to bumper at

WTCC races in Argentina, Japan, China, Thailand or Qatar.

To take part, please visit tinyurl.com/DHL-InMotion, then email us at delivered.magazine@dhl.com, using the subject line "WTCC competition," with the answer to this question:

How many kilometers per year does DHL cover transporting cars and equipment for the WTCC series? **Don't forget to mention the race you would like to attend. And don't miss our story about WTCC ace Tom Coronel on page 42.**

 tinyurl.com/DHL-InMotion

BODY BUILDING

One of the frustrations for many transplant surgery patients is the wait for a suitable donor organ. But what if doctors could "print" you a bespoke replacement body part? Scientists in the U.S. have done just that using a "bioprinter" – a 3-D printer that uses living cells in suspension as its ink and follows a CT scan for its blueprint. Anthony Atala – Director of the Wake Forest Institute for Regenerative Medicine in North Carolina – says the bioprinter "can fabricate stable, human-scale tissue of any shape," and believes the technology could go on to print living tissue and organ structures for transplant surgery.



 tinyurl.com/organs-printing

A BIG STEP FOR ROBOTICS

Google's Boston Dynamics division has tested its humanoid Atlas robot's ability to cope with unpredictable terrain by taking it for a walk in a forest. The result? Despite remaining connected to a power cable, the 6-foot-2-inch (1.82-meter) automaton managed to keep its balance.

 tinyurl.com/atlas-robotics



ON THE BALL

Here's a novel way to deliver the official match ball onto the pitch for games in the World Rugby Sevens Series: via DHL's remote-controlled Match Ball Delivery van. To date, the van has taken the ball to 350 matches in countries including South Africa, Australia, New Zealand and Singapore, driving over 19.5 miles (31.5 kilometers) in the process.

 tinyurl.com/rugby-van



SEPTEMBER

26

The 2nd DHL Global Wind Conference will take place in Hamburg, Germany. It's a great chance to network with industry peers and experts from the DHL Regional Wind Competence Center (RWCC). Find out more here:

 tinyurl.com/DHL-Wind

OCTOBER

3-5

DHL's Global Engineering and Manufacturing Conference will take place in Toronto, Canada. The conference theme is "Rise to the Challenge," encouraging business leaders to be key activists in the global transformations taking place across the industry. Visit our conference website today:

 tinyurl.com/E-M-DHL

OCTOBER

6

Join your industry colleagues at the DHL Global Energy Conference in Houston. Register now at:

 tinyurl.com/Energy-DHL

DHL MOVES PAST THE FINNISH POST

DHL Parcel and DHL Freight Sweden have joined forces with Finnish postal operator Posti and Bring, a subsidiary of Norwegian postal operator Posten Norge, to create a dedicated parcel delivery network across Scandinavia, Finland and the Baltic states. This move creates the largest parcel infrastructure in northern Europe, with 6,500 parcel shops and stations across seven countries, and benefits of shorter transit times, Saturday deliveries and arrival notifications for online retailing.







JOINING FORCES

Mergers and acquisitions are sweeping the life sciences sector with significant implications for its supply chains.

2 015 was a record year for mergers, acquisitions and divestments among life sciences and healthcare businesses. According to consultancy PwC, the industry completed deals worth \$402.9 billion during 2015, more than twice the \$169.3 billion in M&A activity the previous year. There is more on the way.

While it is a handful of huge deals that create the biggest headlines in the financial pages, the broader picture of life sciences M&A is characterized by its diversity as much as by its scale. According to news agency Thomson Reuters, while the pharmaceutical industry saw the most activity, with 108 deals completed in 2015, the rest of the sector was extremely active, too, with 48 deals among biotechnology companies, 54 in medical devices, 23 in the diagnostics sector and a further nine among medical services companies.

Frenzy of activity

The forces driving this frenzy of activity are equally diverse. Life sciences companies merge for many different reasons. Sometimes, they are looking for financial advantages, like the opportunity to base a merged corporation in a country with a more favorable tax regime. However, a hardening stance by the U.S. tax authorities is making such “tax inversion” deals more difficult to execute. Other deals are designed to fill gaps in companies’ future product pipelines or their current market offerings. In many cases, companies want to increase the scale of their operations to boost efficiencies and grow market share – this trend is particularly important in the highly

“Dismantling operations is very difficult and costly for some, but those that emerge with a competency and nimbleness in selling assets will be better positioned to control their own destiny in an ever-changing environment.”

Dimitri Drone, PwC’s Global Pharmaceutical and Life Sciences Leader



competitive generics market, where the dynamics of the industry have been altered by the emergence of large low-cost players like India’s Dr Reddy’s Laboratories.

Deal-making isn’t all about buying, however. Plenty of recent transactions have come about as large players seek to focus on core activities, selling off products and businesses that don’t fit their strategic plans. Allergan is selling its generics business to Israel’s Teva Pharmaceutical Industries for \$40.5 billion, for example.

“In short order, most mature life sciences companies will need to develop a competency in both buying and selling assets,” writes Dimitri Drone, PwC’s Global Pharmaceutical and Life Sciences Leader, in the consultancy’s latest mergers report. “Dismantling operations is very difficult and costly for some, but those that emerge with a competency and nimbleness in selling assets will be better positioned to control their own destiny in an ever-changing environment.”

In a business where new product development is notoriously difficult, expensive and time-consuming, it is little surprise that life sciences companies are tempted to pursue M&A activity as a route to higher sales or increased profits. For the most part, it seems, they are right to do so. When analysts at consultancy McKinsey & Company compared the outcomes of big acquisitions, they found returns to shareholders from pharma acquirers were likely to be significantly higher than industry



GROWTH INJECTION:

Life sciences companies can be tempted to pursue M&A activity as a route to higher sales or increased profits.



IN PRODUCTION:

Product development is notoriously difficult – making merger activity more attractive to life sciences companies.

averages, and much better than the results generated by similar large acquisitions in other industries. The McKinsey researchers found that “consolidation” deals, involving the merger of companies with significant overlaps, provided especially rapid benefits, boosting profit margins by an average of six percentage points and return on invested capital by 16 percentage points in the two years following the merger.

High-risk strategy

Mergers are by no means a sure-fire route to growth or profit, however. When the same McKinsey analysts looked at large deals that have taken place in the medical devices sector over the past 15 years, they found a far greater range of outcomes. While some big medical devices mergers have proved highly successful for companies and their shareholders, there were enough poor outcomes among the 22 large deals examined in the study to leave the average benefit at zero. This finding suggests large acquisitions are “high risk, high reward” for medical device companies, say the analysts.

Overall, says McKinsey, medical device companies with a “programmatic” approach to M&A – systematically pursuing acquisition opportunities to boost their portfolios and support their strategic objectives – do better than companies that enter a single big deal, or those that just take tactical acquisition opportunities as they arise.

16 PERCENT

The amount that consolidation deals involving companies with significant overlaps can boost a return on invested capital in the two years following a merger



Life sciences and healthcare companies are adopting a number of different strategies to better balance risk and reward in M&A. One increasingly common approach is the adoption of new deal structures. Rather than buying a business outright with cash or stock, companies are agreeing to swap assets with competitors, setting up new joint-venture operations or structuring deals that allow sellers to retain rights over future products. “As dealmakers react to the rapidly evolving market landscape, unique deal structures may continue to persist,” says PwC.

Companies are also working hard to get better at the process of M&A. That requires a broad range of skills – identifying suitable targets, conducting effective due diligence and creating the right kind of deal, for example. It requires operational skills, too, especially the ability to quickly and smoothly integrate newly acquired businesses, identifying and capturing opportunities to reduce costs, increase efficiency and share valuable know-how.

Medtronic CEO Omar Ishrak told investors last year that his company was likely to achieve savings of \$300 to \$350 million in the first year after its \$49.9 billion acquisition of Covidien, for example. These savings came from a number of sources, including the closure of more than 60 duplicated facilities and a comprehensive evaluation of the two companies’ indirect sourcing activities, “using best-case contracts and improved purchasing power to achieve meaningful savings.” Ishrak went on to say that Medtronic expects revenues to be boosted by the ability

PACKAGE DEAL:

Merging two separate supply chains may mean looking at where standards for processes like packaging can be integrated.

of the two companies' sales forces to sell a wider range of products to their established customers, noting that capturing that opportunity required significant efforts in order to align the two sales forces and integrate their back-office processes and systems.

The supply chain is inevitably an important area of focus in any integration effort. While the specialized nature of life sciences production processes can mean that bringing upstream supply and manufacturing operations together is expensive and time-consuming, there is often significant opportunity for faster consolidation of the downstream supply chain, especially where the merged companies sell to hospitals and pharmacies in the same markets and regions.

Integrating supply chains

Identifying consolidation opportunities is one thing, capturing them is another. Fully integrating two previously separate supply chains requires changes to physical infrastructure, supply agreements, internal systems, processes and standards. "That's where the work starts," says Angelos Orfanos, President DHL Life Sciences and Healthcare.

Take the choices of supply chain management platform and processes, for example. Where a larger company is acquiring a smaller business or a unit from a competitor, it will usually want to transfer operation of the new supply chain onto its existing systems. Doing that may require the acquiring company to extend its current systems to handle the needs of new products and new customer, says Orfanos. "You need to decide where you can move to common operating procedures, standards for packaging or compliance processes, and where you need to make changes." Those choices are further complicated in the case of joint ventures, he adds, where

partners may also have to choose which of two rival software systems offers the best solution for the new unit.

Integrating logistics contracts and physical infrastructure brings further commercial considerations into play. "You may have a situation where there is redundancy between distribution centers in a region, but if one company has just signed a five-year contract for a new warehouse, they need to decide whether to break that contract or to delay the integration to a later date."

**\$350
MILLION**

The savings that medical device company Medtronic estimated that it could make in its first year after acquiring Covidien

"You need to decide where you can move to common operating procedures, standards for packaging or compliance processes, and where you need to make changes."

Angelos Orfanos, President DHL Life Sciences and Healthcare



In general, says Orfanos, some supply chain activities lend themselves more readily to rapid integration. Many companies start by looking at opportunities to integrate air and ocean freight contracts in primary distribution, since these tend to be shorter-term agreements to start with and often provide significant opportunities for consolidation.

Quick wins

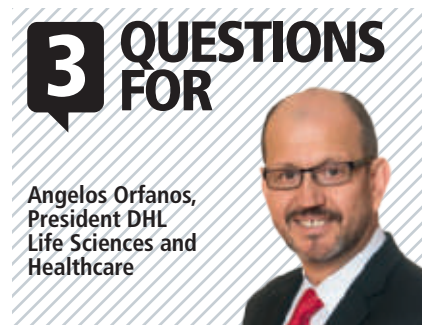
“Transportation is an area that can offer quick wins: companies can go through their existing contracts, do the comparison and consolidate where possible – it’s a relatively straightforward, quantitative process,” says Orfanos. The integration of secondary distribution activities, by contrast, tends to be more complex and delicate, he notes, since decisions about service levels, delivery frequencies and order-to-pay processes will have a direct impact on customers.

Increasingly, life sciences companies are calling on their supply chain partners to play an active role in the integration process, says Orfanos, citing the example of a DHL system that automates the process of comparing and integrating multiple sets of detailed supply chain operating procedures. Post-merger integration can also be a good time for life sciences companies to take a step back and rethink their supply chain strategies, he adds.

“Rather than trying to integrate two completely different systems, there is a third option, which is to look for a new, best-of-breed approach. For many companies, that might include increased outsourcing, and obviously we want to position ourselves as the ideal partner for those efforts.” ■ *Jonathan Ward*

CUSTOMER SERVICE:

Acquisitions and divestments are part of the way the life sciences industry is responding to customer demand.



1. What does the continued high level of M&A activity mean for life sciences supply chains?

Acquisitions and divestments are part of the way the industry is responding to rapid changes in technology, customer demand and the competitive environment. For these activities to succeed, companies must be able to execute them smoothly and efficiently, and that underlines the need for flexible, agile supply chains that can adapt to suit changing needs while maintaining the industry’s basic need for the highest levels of quality, reliability and compliance.

2. How is DHL helping its clients manage the supply chain implications of mergers and acquisitions?

Our global footprint and multiservice offering allow us to support clients in many ways during and after mergers. We can provide the people, knowledge and tools to help companies with network design and optimization activities, or to synchronize their processes and procedures. And our extensive infrastructure and deep sector expertise make us a natural partner when companies want to outsource supply chain activities.

3. What advice would you give to life sciences companies looking to maximize supply chain synergies after a merger?

Due diligence is key, and that’s something many companies are getting very good at. You need to go deep into each company’s supply chain and look at everything from warehouse locations to their choice of technology platforms. But doing that often reveals significant opportunities for efficiencies that can become an important part of the overall business case.





KATHERINE ROSS:

Vice President of Customer & Logistics
Services Johnson & Johnson Supply
Chain and President of Johnson &
Johnson Health Care Systems

KEEPING THE SUPPLY CHAIN HEALTHY

With its relentless focus on customer service in a rapidly changing environment, supply chain agility is key for Johnson & Johnson, the world's biggest diversified healthcare company.

If you want an insight into the full breadth and complexity of the modern life sciences and healthcare sector, Johnson & Johnson is a good place to start. Its 265 operating companies make Johnson & Johnson the world's sixth-largest consumer health company, sixth-largest biologics company, and fifth-biggest pharmaceutical company. It also has the world's most comprehensive medical device offering. Johnson & Johnson employs more than 120,000 people in 60 countries and sales in 2015 were just over \$70 billion.

The aggregate numbers are impressive in their scale, but that's not the way insiders like to look at things. "Our products touch the lives of more than a billion people every day," explains Katherine Ross, who is Vice President of Customer & Logistics Services Johnson & Johnson Supply Chain and President of Johnson & Johnson Health Care Systems. "We never forget that playing a role in healthcare is a privilege, and central to our Credo is that we put the needs of those people first."

That Credo is a statement of corporate values written in 1943 by Robert Wood Johnson II, son of the company's founder. It begins: "We believe our first responsibility is to the doctors, nurses and patients, to mothers and fathers and all others who use our products and services."

Impressively prescient in its focus on quality, service, fairness and environmental responsibility, the document is now quite literally set in stone at Johnson & Johnson's New Jersey headquarters and continues to be the measure by which staff at the company judge every decision they make.

Adding value

Its values may have remained constant, but the products, countries and market segments in which Johnson & Johnson operates are changing faster than ever. The company's supply chain plays an increasingly important role in its efforts to respond to those changes.

"We want to be the best supply chain in the world, as measured by our customers and our peers, to help people around the world live longer, healthier, and happier

lives," says Ross. "In recent years, we've worked hard to become a listening organization. We've sought to understand the needs of customers, so we know what's important to them from a supply chain perspective, and so we can find new ways to add value, beyond getting products to the dock on time."

As part of this effort, for the past four years the company has asked customers in 24 major markets to rate it across 16 different aspects of supply chain performance. It also makes extensive use of internal and external benchmarks to understand how its supply chain operations compare with its peers, and to best practice in other industries.

What does a truly world-class supply chain look like for an organization as large and diverse as Johnson &

1
BILLION

The number of people around the world who use a Johnson & Johnson product every day



DORCAS PATTERSON:
Vice President,
Worldwide
Transportation and
Global Logistics
Category Leader,
Johnson & Johnson

Johnson? One part of the answer lies in a careful balance between centralized scale and tailored service. The scale part has been one of the most important changes in recent years. Historically, Johnson & Johnson has operated as a decentralized “family of companies,” and supply chain responsibilities were devolved to individual members of that family. Today, the supply chain is led at the enterprise level. “Lines of business still have separate supply chains, but our aim is to knit them together where it makes sense to do so,” explains Ross.

Take the supply chain as a whole, and it’s back to big numbers. Including manufacturing, quality, engineering, facilities and logistics, a significant percentage of Johnson & Johnson’s employees are involved in supply chain activities. The company has a network of more than 100 internal and approximately 500 external manufacturing sites, as well as 350 distribution centers. It manages more than 300,000 SKUs (stock-keeping units) and delivers to 250,000 customers around the world.

Economies of scale

Bringing that supply chain together has obvious potential for economies of scale. The company has found considerable scope for consolidation in distribution, for example. Moving different products through the same distribution network saves money, and has advantages for Johnson & Johnson’s customers, too, says Ross – especially those, like pharmacies or hospitals, that are likely to buy a wide range of different J&J products.

The sharing of know-how is every bit as important as the sharing of infrastructure, however, notes Ross. “Our consumer products division works very closely with companies like Tesco and Walmart, which have extremely sophisticated supply chains. The knowledge we gain there is helping us to improve the way we serve customers in other segments, like the hospital channel.”

Similarly, Johnson & Johnson has been able to bring the scale and capabilities of its central resources to bear on the emerging supply-chain challenges that affect many different parts of its business. Ross cites several examples of this sort of effort, including managing diverse and rapidly changing requirements for labeling, customs documentation and temperature control in transportation.

The company is particularly proud, she notes, of the work it has done on serialization to improve the traceability of individual products right through the supply chain. “Here, the company’s work with industry

“We are looking for partners who share our values, especially the unwavering focus on customers and patients.”

Dorcas Patterson, Vice President, Worldwide Transportation and Global Logistics Category Leader, Johnson & Johnson



GOOD LISTENERS:

Katherine Ross and Dorcas Patterson say Johnson & Johnson has worked hard to understand the supply chain needs of its customers.

TRANSPORT EXCELLENCE

One area that epitomizes Johnson & Johnson's balance of centralization and differentiation is its approach to transportation. Dorcas Patterson is the company's Vice President, Worldwide Transportation and its Global Logistics Category Leader. "As an organization, we spend more than \$1 billion a year on transportation," he explains. "We realized that to get the best value and performance, we needed global coordination."

With that aim, Customer & Logistics Services (CLS) set up a Global Transportation Center of Excellence in 2010. The Center of Excellence performs several functions: running global sourcing for air and ocean freight; developing, sharing and deploying best practices in transportation management; and supporting the procurement and management of road transportation, which is devolved to individual regions.

As in the wider supply chain, Patterson emphasizes that sharing knowledge is every bit as important as the economies of scale achieved by centralized pro-

curement. Johnson & Johnson brings teams responsible for logistics and transportation together twice a year in a global transportation management council, rotating the meeting location between different regions to maximize the opportunity for teams to address challenges and align on innovative solutions first hand. CLS has also built a common backbone to support logistics activities, including a global transportation management system, and another Center of Excellence to manage compliance with customs and trade regulations.

Another outcome of a more centralized approach to the procurement and management of logistics and transportation services is growth in the strategic nature of its partnerships with suppliers. "We are looking for partners who share our values, especially the unwavering focus on customers and patients," says Patterson. "Obviously, we expect flawless execution, but we also count on our partners to help us keep an external focus and to provide innovative ideas that will contribute to our goal of becoming the best supply chain in the world."

associations and technology partners has helped to advance the state of the art," says Ross.

Looking further ahead, Johnson & Johnson is also exploring the use of 3-D printing technologies in multiple parts of its business.

But don't forget the diversity. "In a single day, we might ship vials of vaccine to a clinical trial in Sierra Leone, bottles of baby shampoo to India and trauma kits to hospitals across the U.S.," says Ross. Each of these products along with thousands of others, has its own highly specific supply chain requirements. "We like to say that plain vanilla is not the new black," she adds.

Scalable infrastructure

Tailoring the company's supply chain to suit those diverse needs requires tremendous agility and flexibility, says Ross, and that in turn calls for three essential elements. "First, you need really good talent – in the supply chain function and in the individual businesses. Then it is critical to look at your infrastructure and at how to make it scalable and able to create value rapidly. Finally, you need to create visibility, connected to the rest of the business so you can respond to changing demand."

The supply chain's agility is constantly being tested, says Ross, not just by shifts in customer demand but also by changes within the business, like acquisitions and divestitures. "Our ability to support the needs of different products, different markets and different competitive dynamics is absolutely critical," she says. "It's exciting and challenging to find synergies and ways to offer additional value."

Those opportunities to offer additional value can take many different forms. In the highly competitive

U.S. hospital sector, for example, Johnson & Johnson's supply chain capabilities have become an intrinsic part of its competitive offering. "We've always talked to physicians and surgeons about our products, but now we are just as likely to talk to the hospital's head of supply chain, too," says Ross.

The rapid growth of e-commerce in healthcare, especially in Asia, is another area that depends on sophisticated supply chain capabilities. E-tailers have a host of requirements that differentiate them from bricks-and-mortar supermarkets and pharmacies, says Ross, from packaging designed to withstand the rigors of last-mile delivery to high-quality digital images that present products effectively on retailer websites.

As to Johnson & Johnson's ambition to have the best supply chain in the world, it isn't doing badly. It is the only healthcare manufacturer to make it into consultancy Gartner's prestigious 2015 Supply Chain Top 25 listing, an achievement of which it is "very proud," says Ross. There is still plenty to do, however. The pace of change in the healthcare business isn't going to slow down, and the company is determined to maintain its focus on continuous improvement to better meet the needs of billions of people every day.

But evolution is only part of the story, she adds. "At heart, we are a science-based business, and part of that means we carve off the time and resources to search for revolutionary improvements, too – in our products, in our manufacturing, in our processes and in our partnerships." ■ *Jonathan Ward*

\$70+
BILLION

Johnson & Johnson's
global sales in 2015



www.jnj.com

PANDEMIC PREPARATION

The Zika virus is the latest enemy in humanity's ongoing battle against pandemic threats. It's a war in which the right logistics capabilities are a vital weapon.



The Aedes mosquito is aptly named. In ancient Greek, its name means odious or unpleasant. Public health authorities have long recognized that the distinctive black-and-white insect is a vector for a number of viral infections including yellow fever, dengue and West Nile fever. Most recently, however, their attention has turned to a new threat.

The Zika virus, named after the forest in Uganda where it was first discovered in monkeys in 1947, has been associated with a recent rise in cases of microcephaly in part of Latin America – a medical condition in which the brain does not develop properly – and Guillain-Barré syndrome, an autoimmune disease affecting the nervous system. The link between the virus and these diseases is not yet proven, but the circumstantial evidence is strong enough for the World Health Organization to declare the virus outbreak a “Public Health Emergency of International Concern” in February of this year.

Much of that concern is linked to the speed of Zika's recent spread. Since 1952, when the first human cases of

infection were identified, international trade and travel has exploded, providing the ideal conditions for the virus to spread throughout Latin America and beyond within months. The first cases of Zika infection in the Americas were identified in Brazil in April 2015. By the beginning of 2016, 1.5 million people in the country were estimated to have contracted the virus.

Logistics capabilities

Coping with the sudden, large scale demands of pandemic disease outbreaks is a key concern for national and international health authorities. This is why, in May, the World Bank announced that it was launching the Pandemic Emergency Financing Facility (PEF), a \$500-million, fast-disbursing global financing mechanism designed to protect the world against deadly pandemics. In the event of a severe outbreak, PEF funds can be quickly released to affected countries and qualified international first responder agencies.

The right logistics capabilities are also an essential part of international health authorities' planning. “Pan-

**1.5
MILLION**

The number of people in Brazil estimated to have contracted the Zika virus by the beginning of 2016

demographic preparation and response is a broad field,” says Michael Terhoeven, a strategist in DHL’s Life Sciences division, “since the actions required depend very much on the nature of the outbreak.”

Many developed countries include significant logistics elements as part of their general pandemic or catastrophic planning. “They may maintain a network of qualified warehouses with stocks of pharmaceuticals, from pain medications to antibiotics or antiviral drugs, as well as more general aid goods like beds, food, water, tents and other equipment and materials,” says Terhoeven. It isn’t possible to stock everything that might be required to respond to a pandemic threat, however. Even in the case of reasonably predictable threats, like seasonal influenza, the precise strain of virus evolves from year to year, meaning pharmaceutical companies and healthcare providers must race to produce appropriate versions of the necessary vaccines. “Vaccine production at scale takes time,” says Terhoeven, “and that puts extra pressure on

“Pandemic preparation and response is a broad field, since the actions required depend very much on the nature of the outbreak.”

Michael Terhoeven, Vice President Strategy and Development for Life Sciences and Healthcare, DHL

logistics – it is common to need air charters and other expedited approaches to get vaccines into the field in time to be effective.”

Those challenges are compounded in the case of new pandemic threats. The race to develop and test new vaccines requires logistics links, often to inaccessible locations. And once a treatment or vaccine for a new disease is available, the logistics challenges rise again. “Vaccines typically require cold chain logistics, and in those cases it is most often the last mile, or the last hundred miles, that are most difficult,” says Terhoeven. “You might be able to hand-carry the small amounts of vaccine required for trials, but you need a different system for large scale vaccination programs.”

In the case of Zika, an effective and safe vaccine may be years away. Public health efforts are currently focused on prevention – specifically on targeting the mosquitoes that spread the disease. Tests using genetic modification or irradiation to sterilize the insects have shown promising results. But for now, most of the battle is being fought meter by meter on doorsteps and in backyards: covering or eliminating the standing water sources where mosquitoes breed, and distributing insecticides and insect repellents. ■ Jonathan Ward

THE ZIKA VIRUS

Zika is a flavivirus, part of a family of viruses associated with diseases including the West Nile virus, dengue, yellow fever and tick-borne encephalitis. Most of these viruses are so-called arboviruses, transmitted by arthropods like ticks and mosquitoes. In many kinds of arbovirus infection, transmission to humans is one-way: the virus thrives in animal populations and is carried from there to people by its arthropod vector. Zika, by contrast, is well-adapted to its human hosts, and the virus can replicate quickly in the blood, making person-to-person transmission possible via mosquitoes, sexual contact, blood transfusion or the placenta. Its ability to move between human hosts has helped Zika in its formidable spread around the world. In the sixty years after its 1947 discovery, Zika was identified in around a dozen countries across equatorial Africa and Southeast Asia. Since 2007, however, outbreaks of the virus have been reported in Micronesia, Oceania and, most recently, in Latin America. The first cases of Zika in Brazil were identified in early 2015, and by early 2016 the virus had been found in several other countries in South and Central America and the Caribbean. The World Health Organization expects the virus to have spread throughout most of the Americas by the end of the year.

For most people, Zika presents little risk. Symptoms of the infection are usually mild and include fever, skin rashes, conjunctivitis, muscle and joint pain, malaise and headaches. Most people recover completely after a period of a few days to a week. In larger outbreaks, however, health authorities have reported a number of potential complications associated with the virus, including fetal malformations (especially microcephaly, an issue with the development of the brain) and neurological disorders. It is these complications, combined with the rapid ongoing spread of the virus, that have led to widespread concern.

There is currently no specific treatment for Zika. Travelers to affected regions are advised to take steps to avoid mosquito bites, including the use of repellents and suitable long-sleeved clothing.





IRAN – OPEN FOR BUSINESS

With U.N. trade embargoes on Iran relaxed, opportunity beckons as companies queue up to do deals in a major new market – one that is resource-rich and eager to do business.

The relaxation of U.N. and other sanctions on Iran in January this year marks a turning point for one of the Middle East's largest economies – and brings with it huge investment opportunities.

After more than 10 years of crippling trade embargoes, a country with a population of more than 81 million people is now open for business. Companies around the world are jostling for position – and it is easy to see why.

Astonishingly, despite years of isolation over its nuclear program and other political issues, Iran is the world's 20th-largest economy, with a GDP per capita of \$17,400 (purchasing power parity) – while its stock market capitalization has reached \$83 billion and its

young, mainly urbanized population is one of the best educated in the region.

The country is a global energy powerhouse, boasting the fourth-largest oil and the second-largest gas reserves in the world. A lifting of sanctions will ensure Iran has the cash to fund development, while international oil companies (IOCs) will find opportunities for both exploration and production that require minimal capital expenditure – at a time when Big Oil urgently needs to look at cost-effective production. It is also an oil exploration market to which European companies such as Total and BP have strong historical links.

According to Forbes, with the cost of a barrel of crude in Iran at around \$12 compared with an average of around \$9 in Saudi Arabia, around \$36 in the U.S.



CONSUMER POWER:

Iran has a young, urbanized population keen to embrace Western brands.

of the “Next 11,” or N-11, countries after the BRICs (Brazil, Russia, India and China) to offer the greatest growth potential.

The young, tech-savvy population, 73 percent of which is urbanized, is keen to embrace Western brands, according to a recent survey by German management consultants Roland Berger. Some of the most promising consumer sectors for investment include:

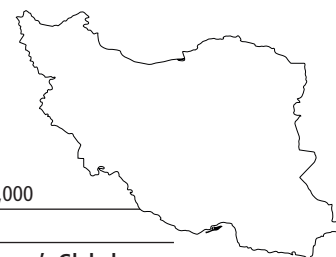
- Food and beverages, from upstream to restaurants and the arrival of franchise brands
- Fashion and retail, with the development of world-class mixed-use developments and malls
- Fast-moving consumer goods, from personal care to cosmetics
- Automotive – Iran has the largest automotive sector in the Middle East, accounting for 10 percent of GDP

In fact, the automotive sector is geared up to return to the highest-ever production capacity of 1.6 million cars reached in 2011, with a predicted compound annual growth rate in new car sales of 16 percent until 2020, according to Roland Berger. Share prices in Iran’s auto sector have increased by 40 percent.

and around \$52 in the U.K., “provided the IOCs are willing to accept the risks and challenges that arise with investing in Iran, the offering of about 18 E&P blocks and 50 oil and gas projects worth \$185 billion by 2020 under the new ‘Integrated Petroleum Contract’ (IPC) might just be the need of the hour.”

Keen consumers

With a median age of just 29, Iranians represent a keen consumer audience and the consumer market has immense potential, offering long-term growth prospects for investors both domestic and foreign. Oxford Economics forecast a growth rate for Iran of 4.0 percent in 2016 and 3.7 percent in 2017, while the country has been designated by Goldman Sachs as one



IRAN

Population: 81,824,000

GDP: \$366.3 billion

World Economic Forum’s Global

Competitiveness Index:

74th place (out of 140 countries)

Group’s Ease of Doing Business Index:

119th place (out of 189 countries)

DHL Global Connectedness Index:

134th place (out of 140 countries)

“With the skills developed in the automotive industry, going forward Iran will not only become a more important import country for car components but it will increasingly grow as an export base,” says Fathi Tlatli, President Global Automotive sector, DHL CSI.

Infrastructure needs

However, while Iran is poised for economic expansion, the country’s infrastructure requires huge foreign direct investment, and major improvements to its road and rail networks as well as to its ports and airports infrastructure. According to some estimates, the potential for post-sanction projects in the transport, logistics and construction sectors could be as high as \$200 billion. Overall, it is estimated Iran needs \$500 billion of foreign direct investment over the next decade.

According to “All That Glitters,” a new report from the Economist Intelligence Unit (EIU) on post-sanction opportunities, “Iran requires massive investment in, primarily, power generation, water supply, air and rail.” The report continues: “In the three-and-a-half decades since the Islamic revolution, Iran’s government has spent considerable sums on its infrastructure, most noticeably roads, public housing, airports and rural electrification, but improvements have failed to keep pace with official plans or population growth.”

Iran has already agreed a deal with Airbus to buy 118 new aircraft, and is planning to build seven new in-

ternational airports over the next decade. There are also plans to spend \$25 billion modernizing and expanding the country’s rail network, and the head of Iran’s Power Transmission, Generation and Distribution Company, Arash Kordi, has said Iran needs to invest some \$7-8 billion a year on power generation and distribution.

Another major priority, given Iran’s seven-year drought, is the construction of new desalination plants.

James Min, Vice President of International Trade Law and Global Head Trade Law Practice Group at DHL, says despite the fact that U.S. primary sanctions are still in effect, the incremental relaxation of U.N., EU and U.S. sanctions now permits certain business transactions with many Iranian ports and will lead to increasing levels of transparency at those marine terminals and ports, which in turn will result in greater participation by leading international logistics companies in Iran.

The immense opportunities for major investment in the supply chain infrastructure are part and parcel of Iran’s future growth strategy.

A new joint venture signed between Daimler and Iran Khodro and Mammut groups to manufacture commercial trucks, initially from kits, heralds a key opportunity – and not just for the domestic market. Given Iran’s export ambitions, the sale of finished trucks to neighboring markets represents a major export opportunity.

\$12

The price of a barrel of crude oil in Iran, compared with \$36 in the U.S.



GEARED UP:

Iran has the largest automotive sector in the Middle East, accounting for 10 percent of GDP.



As to where infrastructure development should be focused, Min believes that “human capital, complemented with a strong set of transparent and consistent legal and regulatory frameworks, can be tremendously helpful in unlocking the true potential of emerging markets and the participation of the private sector is paramount in shaping the future of this industry.”

Trade zones

Access to Iran’s special and free economic zones, offering incentives such as 15-year tax exemptions and faster administration, is part of the game. But the ability to serve the market with air-side infrastructure in major manufacturing and economic hubs such as Tehran, Esfahan and Tabriz will also be imperative, Min believes.

The arrival of multinational companies, dealing in everything from fashion and retail to fast-moving consumer goods, pharmaceuticals, as well as the emergence of major online businesses and startups, are a solid indicator that the market is starting to evolve and change.

The launch of the Asia Infrastructure Investment Bank aiib.org has rekindled the idea of a new Silk Road – an interconnected trade route snaking from China all the way to the Mediterranean – passing through Iran. However, without the full development and integration

of Iran’s trade routes, the new Silk Road will remain just an ambition.

The reality is that while the excitement over the opening up of Iran’s vast market has been brewing for the past two years, not all companies have done their homework. Also, some multinational companies have been cautious because different aspects of EU and U.S. sanctions have still not been completely phased out.

However, the dizzying speed of change has caught many senior executives offguard. They have had to go from a space where Iran was seen as a pariah state to watching major competitors mobilizing and realigning their resources in the region.

Many of these dynamics will create a domino effect as Iran’s economy plugs back into the global grid. The comeback of Iran will ripple out far beyond its shores, as companies rethink their tactical positioning and redeploy capital in their broader MENA strategy. ■ *Ali Borhani*

Ali Borhani is the Founder and CEO of incubeemea.com, a Strategic Boutique Advisory Firm specialized in Frontier Markets in MENA and Iran.

US MANUFACTURING MAKES A COMEBACK

After years of offshoring production, U.S. firms are poised to bring some of their manufacturing back home thanks to investments in automation and technology.

Made in China” has become the most common label in the world, stuck to everything from Nike sneakers to iPhones. But “Made in America” is making a comeback.

America’s manufacturing industry is poised to overtake China’s as the world’s most competitive by 2020, according to a survey of 500 senior manufacturing executives by the Washington D.C.-based Council on Competitiveness and Deloitte Global.

This would be a reversal of China’s – and Asia’s – more than four-decade rise as a global manufacturing power. In the 1970s, U.S. manufacturers started shifting production abroad for low wages, tax advantages and other cost savings, focusing at home on design and functionality. American factory jobs plunged from a record 19.6 million in 1979, or a fifth of the workforce at the time, to a low of 11.5 million in 2010, or 9 percent of the workforce, according to the U.S. Bureau of Labor Statistics.

This loss has made China an easy target for American politicians in the latest presidential primaries, with Donald Trump and others vowing to bring jobs back home.

“If you listen to the rhetoric you would think we were going to hell in a handbasket, with some people saying we don’t make things anymore and we’re sending all of our jobs overseas,” said Reg Kenney, President of Engineering & Manufacturing at DHL.

But in fact, more companies are moving manufacturing back to the U.S. – or not going overseas at all.

Apple, which has been slammed by Trump for offshoring its manufacturing to China, started making the new Mac Pro personal computer in Austin, Texas in 2013, part of a \$100-million Made in USA push. General Electric is making more energy-efficient light bulbs in the U.S., which Walmart has agreed to sell exclusively in its stores.

Another is International Biophysics, which brought the assembly of AffloVest back to Austin from Germany to cut costs, speed up packing and distribution, and improve the design of the medical device with longer battery life and more sizes.

Delivery time is fast now, quality control has improved and sales have risen, says Dana Kolflat, director

of marketing. “The product manufacturing is in the same building as my office,” he said. “We can respond to anything quickly because we have full control of manufacturing and distribution.”

In a 2015 survey of U.S. manufacturers with annual revenues over \$1 billion, the Boston Consulting Group (BCG) found the U.S. is the favorite location for new factory capacity to sell domestically. Thirty-one percent of respondents said they were planning to shift production facilities from China to America, while 20 percent said they would add capacity in China. This is a reversal from 2013, when 30 percent said China was the most likely destination for new capacity serving the U.S., and 26 percent said capacity would be added in America. Also, the number of respondents reshoring production increased by 9 percent in 2015 compared with 2014 – and by 250 percent compared with 2012.

Key reasons to reshore include shortening the supply chain, cutting shipping costs and being closer to customers in the large U.S. consumer market. The boom in shale oil and natural gas production has also slashed energy costs compared with China and other big manufacturing nations.

Meanwhile, China’s low-cost attraction is waning. Real wages are poised to rise 4.2 percent in Asia this year, the highest globally, according to a study by Korn Ferry Hay Group, a consulting firm. Real wages in the U.S. are set to rise by 2.7 percent.

31 PERCENT

The share of U.S. manufacturers with annual revenues above \$1 billion planning to shift production facilities from China to America in a 2015 survey

Innovation

But perhaps the biggest driver of U.S. competitiveness is automation and innovation. Once dull, hot and noisy, factories have been outfitted since the late 2000s with high-tech computers, machinery and robotics to make them fast, flexible, lean and proficient.

“We’re seeing increasing use of tools from super-computing to simulation modeling to cut out tremendous costs and time in the production system,” says Deborah Wince-Smith, president and CEO of the Council on Competitiveness.

With 3-D printing, for example, manufacturers can print objects out of metal and plastic. This makes design more precise and reduces waste compared with traditional methods. Disney, for example, is using 3-D printing to make toys – even stuffed toys still assembled by hand.

Aircraft makers are printing more efficient components out of high-cost alloys. Pepsi is using simulation modeling to create and analyze digital prototypes of their cans to improve design. Boeing engineers have been trialing a scheme using augmented reality with Google Glass to improve efficiency when carrying out complex tasks such as assembling an airliner's wiring loom, and giving mechanics tablet computers using 3-D visualization to help reduce the number of assembly errors.

In many cases, it's not mass production that's being reshored, but rather high-end products, such as Apple's Mac Pro, which starts at \$3,000 and used by professional video and music producers. High-tech products such as this require a more skilled workforce and much more flexibility in the production process. This doesn't just level the playing field between China and the U.S., but tilts it in favor of the U.S.

Challenges

There are challenges to be overcome if the increase in U.S. competitiveness is to continue. Rising costs for healthcare and wages could slow expansion in factory capacity. And because millions of manufacturing jobs were lost to Asia between 1990 and 2010, the skills manufacturers need to bring more advanced technologies online are in short supply.

"We are not getting enough of our young people into engineering, while countries like India and China are producing thousands of engineers every year," Kenney says.

The factory jobs of the future will require more digital and computer training, not just a high-school degree, says Wince-Smith. While the transition could

12.3
MILLION

Factory employment in the U.S. in early 2016

be hard, she believes new jobs will be created – as in Wales, which has shifted from a reliance on coal mining to huge growth in biotech and software. "It's not that fewer people will be employed," she says, "It's that they will be employed in totally different things that enable and [retain] this manufacturing ecosystem, and it's not just jobs in the making of things, it's everything from core ideas to disposal and energy productivity."

However, the vastness of the Chinese consumer market is encouraging U.S. companies engaged in offshoring to keep manufacturing there to meet rising demand. And while wages have risen in China, manufacturing remains cheap. The minimum wage averaged \$264 per month in 2015, a fifth of what it is in the U.S. Companies are also finding lower labor costs in Vietnam, Malaysia, Indonesia and India, Wince-Smith adds.

What's more, Chinese factories are pouring money into technology. In 2015, China had 36 robots per 10,000 workers in manufacturing, putting it in 28th place globally, compared with 478 in South Korea, which tops the ranking, and 164 in the U.S., which occupies seventh place, according to the International Federation of Robotics. By 2018, China will account for more than a third of all robots installed worldwide, the Federation estimates.

"China is importing 10 times more robots than the U.S.," says Klaus Dohrmann, Vice President Strategy and Development at DHL Engineering & Manufacturing. "China has recognized that this is a differentiating factor and they are trying to close that gap."

But as an early mover, the U.S. is ahead in advanced technologies, and this is driving the reshoring trend not only with regard to new capabilities, but also what has been China's main attraction – cheap labor. Another BCG study found that China's cost advantage over the U.S. had shrunk to less than 5 percent thanks to rapid productivity growth.

Companies are now seeing the advantages of U.S. manufacturing. French airplane manufacturer Airbus opened its first U.S. plant in 2015, and all the world's leading carmakers now have plants there. This should hearten the presidential candidates – or at least soften their vehemence. U.S. factory employment recovered to 12.3 million in early 2016 – and Apple now has a new product label: "Designed in California. Assembled in USA." ■ Charles Newbery



APPLE CEO TIM COOK

used his Twitter feed to show himself touring the Mac Pro factory in Austin, Texas. In his Twitter post, Cook wrote: Watching the Mac Pro come together in Austin, thanks to a team loaded with American manufacturing expertise.



ARE THE STORM CLOUDS LIFTING?

At the start of the year, doom-mongers were predicting an economic meltdown. Since then, news coming out of China and the developing world has been more positive. But are we out of the woods – and what can businesses do to stay one step ahead of the game?

As the new year dawned, dark clouds were looming on the economic horizon, and experts were warning a perfect storm could be brewing in the global economy that would wreck the recovery.

In its January report, *Global Economic Prospects 2016*, the World Bank said it expected economic activity to pick up to 2.9 percent this year from 2.4 percent in 2015, but warned “anemic recovery in emerging markets will weigh heavily on global growth in 2016.”

Hard on the heels of the World Bank report, there was a similar air of pessimism at the G20 summit of the world’s top finance ministers and central bankers in Shanghai in February.

In her opening remarks, International Monetary Fund (IMF) Managing Director Christine Lagarde said: “Activity weakened unexpectedly at the end of last year, which has led us at the IMF to revise growth downward for this year and beyond.”

“Growth in advanced economies remains modest, and some emerging markets are showing signs of distress. On top of this, China’s necessary transition to a more balanced growth model has added to market volatility. All this has unsettled financial markets, which in turn depresses consumer and investor sentiment.”

However, by the beginning of April, the storm clouds appeared to be lifting. Assessing the global economy over the first quarter of 2016, Michael J. Bell from

2.9 PERCENT

The World Bank’s forecast rate of economic activity for 2016, up marginally from 2.4 percent in 2015



G20, SHANGHAI:
Christine Lagarde,
IMF Managing Director.

JPMorgan’s Global Markets Insights Strategy Team says that fears have “started to ebb” over global growth, China and falling oil prices.

China in particular is not showing the decline forecast by some pundits at the start of the year. “The latest data continues to show the economy transitioning away from manufacturing and towards services and consumption. The rate of economic growth is slowing gradually, but the economy is not collapsing,” says Bell.

“Industrial production growth has slowed to 5.4 percent year on year and retail sales continue to grow rapidly at over 10 percent year on year. The reality is probably that China is growing at a slightly less spectacular pace than previously. That does not make for exciting headlines, but it is very different from a much talked-about ‘hard landing.’”

He concludes: “Overall, we continue to expect moderate positive growth from both the U.S. and Europe, and growth in China in the region of 5-6 percent. We do not think there is a higher than 30 percent chance of recession in 2016.”

Even the World Bank – that harbinger of doom at the start of the year – has conceded that the South Asia region, led by India, is set to be a bright spot, and says the recently negotiated Trans-Pacific Partnership could provide a welcome boost to trade.

“South Asia has experienced a long period of robust economic growth and it has been among the fastest-growing in the world. Growth is projected to

steadily increase from 7 percent in 2015 to 7.6 percent by 2017,” according to a bank update.

The flagging Indian economy has been revitalized since Narendra Modi’s BJP party won the general election in May 2014. Prime Minister Modi is seen as pro-business and is in the process of liberalizing the economy and working on introducing new legislation – the Goods and Services Tax – which aims to create a unified tax regime across all India’s states.

Meanwhile the World Bank’s latest East Asia and Pacific update, looking at China, Korea, the Philippines, Vietnam, Thailand and other countries in the region, says that growth is only expected to ease “modestly” from 6.5 percent in 2015 to 6.3 percent in 2016 and 6.2 percent in 2017-18, reflecting China’s gradual shift to slower, more sustainable growth.

Excluding China, the region’s developing countries grew by 4.7 percent in 2015, and the pace of growth is set to pick up slightly to 4.8 percent in 2016 and 4.9 percent in 2017-18.

“Developing East Asia and Pacific continues to contribute strongly to global growth. The region accounted for almost two-fifths of global growth in 2015, more than twice the combined contribution of all other developing regions,” says Victoria Kwakwa, World Bank East Asia and Pacific Regional Vice President.

There are also new stars on the horizon. Iran has suddenly become “open for business” (see page 20), thanks to the easing of sanctions, with Iran’s president, Hassan Rouhani, already signing trade deals worth some €50 billion (\$56 billion) with EU countries.

Adapt to survive

The global economy isn’t completely out of the woods yet, though, and businesses need to stay one step ahead to thrive in a very competitive market – and insulate themselves from any future downturns.

Michael Wiedemann, SVP for Global Solution Delivery & Service Management for DHL Customer Solutions & Innovation, believes the ability to adapt is key.

He says that while years ago the political and economic climate was fairly stable, customers now face more frequent and volatile changes in the supply chain. As a result, companies need to be much more adaptable, so they can quickly appraise the situation and make the necessary changes.

“There isn’t one biggest risk – in global supply chains many components are unpredictable now and companies need to accept this volatility. On a strategic level they need to look at their networks – where to manufacture, how to get goods to the customer – have a plan B and C at the back of their minds, how to react to volatile developments of, for example, oil price changes or changes in labor costs. On a more tactical level they need to react to short-term volatilities in demand and transportation costs. Is speed required, or can one take advantage of cost opportunities in other transportation modes? And you

need to be prepared for the unpredictable. Natural or man-made events which might interrupt supply chains without any early warning indication.” Wiedemann harkened back to the Icelandic volcano eruption several years ago, bringing parts of the global supply chains to a standstill and forcing cargo to be re-routed throughout most of Europe. ■ *Keith Crane*



Michael Wiedemann
Senior Vice President Global Solution
Delivery and Service Management at DHL
Customer Solutions and Innovation

1. What are the major risks facing companies due to current global economic conditions?

The volatile global economy presents many different kinds of risks for companies. On the demand side, changing rates of economic development affect the purchasing behavior of consumers and businesses. Government actions are having a big effect, too, whether it’s slowdowns in state spending on big energy or infrastructure projects, or the introduction of new taxes, duties and trade restrictions. On the supply side you have volatility in input costs, like big changes in the oil price and rapidly rising labor costs in some emerging markets, to mention just two notable examples.

2. How can different supply chain strategies help a company to manage those risks?

Supply chains can respond to risk and volatility in different ways. At the tactical, day-to-day level, they help companies respond to events – for example, by switching transportation modes to avoid delays and disruptions, or as relative costs change. At the strategic level, the configuration of an organization’s supply chain plays a big role in its ability to manage costs and meet changing demand, whether that means switching production between offshore and near-shore locations or redesigning and resizing distribution networks as regional demand patterns change.

3. How does a company build a more agile, nimble supply chain?

Companies need to do their modeling and scenario planning, so they understand their best options as manufacturing and transportation costs change or demand fluctuates. And they need to be close to events, so they can react quickly when those changes occur. Digital technologies are making that easier, with better market intelligence and tools like DHL’s Resilience360 helping companies spot issues across complex global supply networks. Even the best knowledge is worthless if you don’t have the ability to make use of it, however. Companies need to build flexibility and responsiveness into their networks. Several manufacturing companies did this after the 2011 tsunami in Japan – by moving from single to dual sourcing for key components, for example. Finally, there’s the need for a mindset change. Companies need to see the supply chain not as a cost but as a source of competitive advantage. One key step on that journey is to ensure the supply chain is represented at the top of the organization, with a chief supply chain officer role as a permanent role on the board.

THE TRAFFIC LIGHT FOR GLOBALIZATION

The U.S. and EU must succeed in coordinating and harmonizing regulatory policies affecting trade in goods and services with the Transatlantic Trade and Investment Partnership (TTIP). The benefits for all would be enormous.

Globalization is here to stay. Rapidly advancing technology will drive globalization, and no government, ideology or citizens' movement will be able to stop it.

One key aspect of globalization is global trade. Nowhere is this more important than between the U.S. and the EU. These economies are two of the most modern, most developed, most integrated and most committed



IN HARMONY:

The U.S. and the EU are working together to try to remove trade barriers.

to high standards of consumer protection in the world. They already maintain a total of more than \$4 trillion in investment in each other's economies. Together, the EU and U.S. economies account for 50 percent of global GDP (41 percent of purchasing power) and 35 percent of world trade flows, with \$2.7 billion worth of goods and services traded daily. The transatlantic economy generates \$5.5 trillion in total commercial sales (equivalent to 47 percent of global GDP) and provides jobs for more than 15 million people. U.S.-EU merchandise trade has increased by 68 percent since 2000.

The ongoing negotiations between the U.S. and EU over the Transatlantic Trade and Investment Partnership (TTIP) seek to establish "traffic lights" for globalization. Of course, TTIP seeks to eliminate tariffs and substantially reduce non-tariff barriers to trade and investment. SMEs in particular will benefit from lower tariffs. But

given the low average tariffs (less than 3 percent), the key to unlocking this potential lies in the tackling of non-tariff barriers.

Here the essential overriding objective of TTIP becomes a strategic one – for the U.S. and the EU to set a precedent, to create rules of the road for future global trade, investment flows and international commerce.

If the transatlantic community succeeds in coordinating and harmonizing regulatory policies affecting trade in goods and services, the rest of the world will have no choice but to follow. TTIP provisions on services, state-owned enterprises, the environment, labor and competition policy would become the blueprint for global standards and future WTO negotiations. If the U.S. and the EU were to fail, other emerging economic powers would set the rules based on different values.

Significantly reducing the cost of differences in regulations and standards means promoting greater compatibility, transparency and cooperation, while maintaining high levels of health, safety, and environmental protection. It will also mean developing rules, principles and new modes of cooperation for issues of global concern, including intellectual property and market-based disciplines that address state-owned enterprises and discriminatory local barriers to trade.

As an example of the benefits of regulatory harmonization across the Atlantic, the non-partisan Peterson Institute for International Economics in Washington, D.C. estimates that harmonization of vehicle regulations would increase U.S.-EU auto trade by at least 20 percent, resulting in national income gains for both partners of more than \$20 billion per year in the long run.

For the DHL group, the direct benefits from an ambitious TTIP agreement could include:

- Improved customs/border clearance efficiency by creating a zero-tariff region; an increased de minimis exemption for low-value shipments; a robust single window for government-wide processing of clearance data; expedited release of express shipments; and expanded use of preclearance and advanced data.
- Regulatory cooperation, including both product standards and regulations, as well as cargo screening and "Trusted Trader" program harmonization.
- Market access changes would support greater open investment, fair government procurement procedures (e.g. elimination of "Buy America" and "Fly America" restrictions) and consistent product certifications.

But the true test of success for TTIP will go beyond making goods more affordable and creating competition among manufacturers and service providers. The real test will be in managing the potential negative fallout – the relocation or outright elimination of jobs. Trade policies must place great emphasis on retraining those affected by globalization. To neglect those who find themselves unemployed through no fault of their own will tear apart the fabric of society. Done right, TTIP will be a success for all. ■ *Wolfgang Pordzik*

ON THE RADAR

Social trends and technological advances will have a major impact on the logistics industry in the years ahead.

In the fast-changing field of logistics, industry leaders need to be aware of important trends. Some of these are long range and unlikely to make an impact for five years or more – others are just around the corner, ready to shake up established ways of doing business.

The 2016 Logistics Trend Radar is the third edition from DHL's Innovation and Trend Research Department. Since its first release in 2013, the Logistics Trend Radar has become an industry-acclaimed tool that provides valuable insight and information on transformational changes and the latest social trends and technological advancements likely to shape the future of logistics.

From macrorends such as the changing energy and trade landscape to microrends such as logistics startups unbundling the logistics industry, the in-depth report reveals which sectors will be affected by developments and time frames for their potential impact or introduction over the next decade.

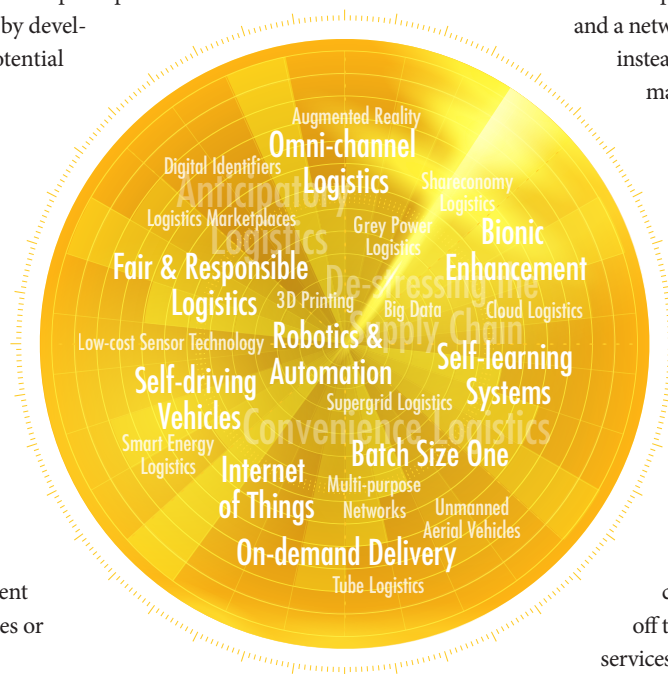
On the social front, two of the significant trends that could change the logistics landscape are the movement towards fair and responsible supply chains, and the growing importance of the "sharing economy," a sector originating with startups such as Uber and Airbnb.

Logistics companies can profit from this by facilitating peer-to-peer sharing – shipping and wrapping shared goods, for example – and by sharing infrastructure and equipment such as forklifts with smaller businesses or even competitors.

Another leading social trend dubbed "on-demand delivery" could result in new last-mile delivery concepts using flexible courier workforces to enable customers to have their purchase delivered when

50 BILLION

The number of objects estimated to be connected to the Internet by 2020, presenting a \$1.9-trillion opportunity in logistics



they need it, where they need it. Yet while social trends are worth keeping an eye on, technological developments are expected to have the biggest impact on how logistics providers do business.

Some are headline grabbing, such as autonomous vehicles. Whether in the air or on the ground, self-driving vehicles capable of making deliveries without human help continue to intrigue logistics providers.

The Internet of Things (IoT), meanwhile, has the potential to connect virtually anything to the Internet and accelerate data-driven logistics. It is estimated that by 2020 more than 50 billion objects will be connected to the Internet, presenting an immense \$1.9-trillion opportunity in logistics.

Revolutionary

Yet with increasing consumer demand for personalization, a hot new trend on the radar is "batch size one" – product runs of a single item, requiring tremendous investment in automation and complex supply chains. "Highly automated 'speed factories' will utilize cutting-edge robotics, automation and 3-D printing technologies to rapidly produce individualized goods," notes the report.

Indeed, 3-D printing is a disruptive technology that could revolutionize the industry by eliminating the need for warehouse spare parts, as downloadable specifications and a network of 3-D printers could do the job instead. "Imagine being able to use the same machines for a wide variety of product

types without the need for hard tooling," says Joseph Scott Schiller, Head Market Development HP 3D Printing. "This would mean much more flexible, efficient capital investment, which could be distributed to put supply closer to demand."

Coming full circle, bionic enhancements such as exoskeletons may soon offer a way for companies to use technology to help workers be more effective and safe, extending their effectiveness as they age. Other trends, such as cryptocurrencies (think Bitcoin), have dropped off the radar, while others, such as real-time services and urban logistics, have become the industry's "new normal." ■ *Andrew Curry*

To download the report, please visit:

 tinyurl.com/trend-radar

SOLUTIONS

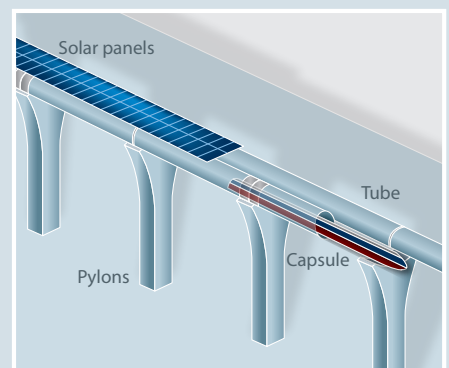
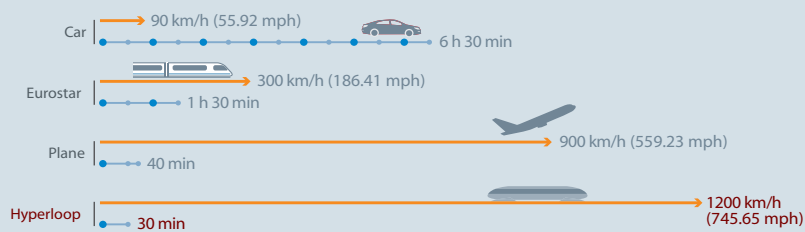
**\$6
BILLION**

The initial cost estimate of a passenger Hyperloop route between Los Angeles and San Francisco



Travel time from San Francisco to Los Angeles

Distance: 560 kilometers



**760
MPH**

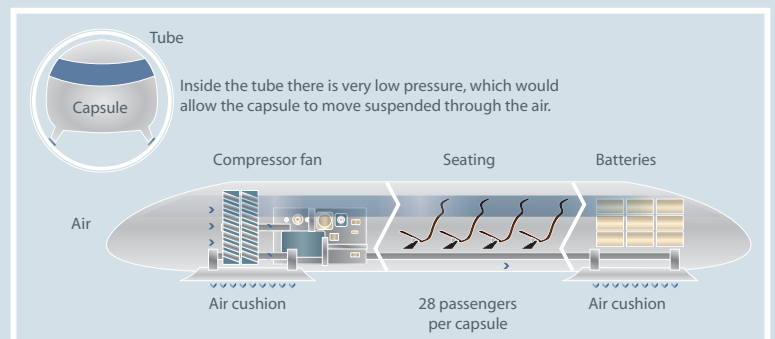
Hyperloop's maximum speed with passengers on board

30 MINUTES

The estimated time it would
take to travel from Los Angeles
to San Francisco

1G

Hyperloop's maximum
acceleration




FAST TRACK FOR SUPER SPEED

Welcome aboard the Hyperloop – a sleek capsule that is designed to rocket passengers and freight through a continuous steel tube at speeds of up to 760 miles per hour.

It might sound like sci-fi, but two companies are racing to make it a reality. One, Hyperloop Transportation Technologies, is building its own five-mile test track at Quay Valley, California. The other, Hyperloop One, invited teams of engineering students to design the capsules that will whizz through the tube. The first round of the competition was won by a group of graduates from MIT (their design is pictured) who will now go on to build a small-scale prototype. Hyperloop One has also started work on its own test track in Nevada, with testing scheduled for the end of this year. At the moment, then, this is still a concept on a drawing board. But if and when it's put into practice, the Hyperloop – the brainchild of Elon Musk, the inventor, entrepreneur and CEO of Tesla Motors and SpaceX – could revolutionize train travel. In Europe, it is thought people and freight would be able to travel from Budapest, Hungary, to Vienna, Austria, in less than 20 minutes – a journey that would take two-and-a-half hours by road. ■



 <https://hyperloop-one.com>

WILL A ROBOT TAKE MY JOB?

Frightening sci-fi scenarios of robots replacing humans in the workplace are a long way from reality, according to experts – who say machines can make up for the developed world's labor shortage.

A new industrial revolution is underway. Robots are set to transform the workplace and change our everyday lives, from the way we clean our homes to how we access education and healthcare.

Since the first industrial robot became operational in a General Motors car plant in 1961, the spread of robots has been slow. They have been used largely in manufacturing, mostly in automotive factories. But recent advances in artificial intelligence, big-data analytics, sensors, cloud computing and mobile technology are unleashing more adaptable and increasingly sophisticated robot technology.

With new capabilities of movement, visual recognition and the use of motion-sensitive technology, robots are able to replicate tasks once left to humans. In the field of logistics, robotics has been a long time coming, but is now being tested in warehouses and sorting centers for picking, loading and packing.

Experts are divided on the effects this new breed of automatons will have on employment. Some argue that robots represent a real threat to millions of jobs, while others say such predictions are just scaremongering.

A 2013 study by Michael Osborne and Carl Benedikt Frey of Oxford University predicted that 47 percent of jobs in the U.S. were “at risk” of being automated within 20 years – and that the implications extended to other developed countries.

The study “The Future of Employment: How Susceptible Are Jobs to Computerisation?” examined more than 700 detailed occupation types, noting the types of tasks workers perform and the skills required. By weighting these factors, as well as the engineering obstacles preventing computerization, the researchers assessed the degree to which these occupations might become automated.



10 MILLION

The number of extra workers Germany is predicted to need over the next 15 years – a figure that could be offset by increased use of robots

Dr. Osborne says: “We identified several key bottlenecks currently preventing occupations being automated. As big data helps to overcome these obstacles, a great number of jobs will be put at risk.”

The paper adds: “Our model predicts that most workers in transportation and logistics occupations, together with the bulk of office and administrative support workers, and labor in production occupations, are at risk. More surprisingly, we find that a substantial share of employment in service occupations, where most U.S. job growth has occurred over the past decades, is highly susceptible to computerization.”

However, other experts point out that new technologies have been changing working patterns for centuries, from the advent of steam to the coming of electricity, and that the increases in productivity unleashed by these advances have boosted economies, creating new avenues for job creation.

Erik Brynjolfsson, co-author of “The Second Machine Age,” argued this point at the World Economic Forum earlier this year. “It is true that robots are taking away some jobs, but at the same time they are creating lots of new jobs,” he said, according to a Huffington Post report. He said the big question was whether sufficient new employment would be created to match the jobs lost to robots.



Labor shortage

It's quite possible that robots may simply help solve a growing labor shortage in western countries with ageing populations. U.K. employment levels have never been higher, while German unemployment is at a record low. Germany is predicted to need an extra 10 million workers over the next 15 years, according to a study by Boston Consulting Group, and the United States faces a potential employment shortfall of up to 35 million workers over the next 30 years. As the population ages, there are fewer younger workers to support the retired population – and robots offer a golden opportunity to boost productivity.

There is much debate about which types of jobs will be replaced by this industrial transformation. Simple, repetitive tasks can easily be replicated by machines. But the speed and breadth of the robot revolution will ultimately depend on return on investment. With a low-wage workforce in many parts of the world, the economics of automation fail to stack up, but as technology costs fall, the use of robots will increase.

Some predict that “heavy-lifting” jobs such as shifting, moving and carrying will be ripe for automation. But many manual jobs require very specific actions, which makes it harder for machines to replicate them – so plumbers, chefs, electricians and decorators will

be safe for some time. Call centers are rapidly being automated, but this is freeing up operators to spend more time on customer service.

In the field of logistics, companies are experimenting with the use of robots for picking items, shifting them around warehouses and packing them. So far progress has been slow, but rapid advances in technology and the falling cost of robotics promise to usher in a new era of automated supply chains.

DHL's trend report “Robotics in Logistics”, published in March 2016, charts the rise of robots in the logistics industry and points to growing interest in the field. In 2012, Amazon paid \$775 million to buy Kiva, a robotics startup with a focus on warehouse logistics. Amazon claims to have 30,000 robots operating in 13 fulfilment centers. Meanwhile, Google has bought eight robotics startups, including one that focuses on automatic trailer unloading using advanced perception.

According to Tom Bonkenburg of Dutch-based supply chain engineering and consultancy firm St. Onge, some 80 percent of logistics warehouses are fully manual in operation, while only 15 percent have some kind of automation and just five percent are highly automated.

Collaborative working

One transformative trend in robotics is collaborative working between robots and humans. In the past, robots were placed in safety cages as they posed a danger of injury to humans. But technological advances mean they are now equipped with sensors, so if a human gets near they stop automatically.

A typical area ripe for automation in a distribution center is co-packing. For instance, a retailer may want a two-for-one offer for a month, with two units combined in one pack. A worker could teach the robot how to pack the items together so the robot handles the repetitive part of the task, supported by a human.

Markus Kueckelhaus, Vice President of Innovation & Trend Research for DHL and one of the trend report's authors, says: “In the near future the main applications for robots in logistics are for warehousing processes – that's the environment where we see robots playing a bigger part, because the complexity is smaller than if we go for transport or last-mile processes. Value-added services such as co-packing are ideal scenarios where robots and humans can already work effectively together today.”

Logistics workers will need to get used to working alongside robots and become skilled at teaching them new tasks. As e-commerce booms and demand for labor increases in the logistics field, robots will be there to lend an automated hand. ■ David Benady

 tinyurl.com/bbc-robot

Oxford study:

 tinyurl.com/computerized-jobs

 tinyurl.com/jobs-at-risk

ALL IN THE MIND

In business, time is precious – and planning is time consuming. Mind mapping, a simple but powerful concept, can help organize complex ideas.

Planning a complex project requires many hours of careful thought, often taking a multitude of different factors, stakeholders and scenarios into account. It's enough to leave your head spinning.

But what if there were a way to help structure those thoughts during the planning process, leaving you with a visual map of your project – and showing how all those different threads are woven together?

Enter mind mapping, a concept invented by British-born author Tony Buzan and rapidly gaining traction in business. Mind maps are diagrams used to organize information visually. While these may initially seem superficial or playful, they can be an extremely powerful way to represent and remember concepts and ideas.

Impact on the brain

Images have an immense impact on the human brain. Combine a series of pictures and words into a map outlining your project, and you have a powerful tool that will help you collect and organize your thoughts. And, according to imindmap.com, 250 million people are using them worldwide.

Mind mapping can be used for anything and everything, from planning a complex project to writing a speech or organizing a business trip with an intricate itinerary – or even in your personal life, perhaps helping to realign your work-life balance.

In short, it is a way to manage information overload in the modern world – and the power of a mind map lies in its beautiful simplicity.

Thanh Pham, one of the founders of the blog [AsianEfficiency](http://AsianEfficiency.com), likens mind maps to a Swiss Army knife – and prefers mind mapping to taking notes at a meeting. Author Melanie Pinola, on the [Lifehacker](http://Lifehacker.com) website, points out that the combination of words and pictures makes it six times easier to remember information than words alone – in fact it's a mnemonic tool that's been used by memory experts for decades.

Bold like Branson

Mind maps can even give you insights into how other people's minds work – mind map specialist IQ Matrix, for example, has mapped Richard Branson's mind to show some of the thought processes that make him such a successful entrepreneur.

The Branson mind map is just a single page, full of color and with a multitude of little drawings pinpointing his skills, beliefs, values and qualities. Presented this way, it's easier to understand what makes him tick – and it's entertaining, too.

The one thing that all mind maps have in common is their organizational structure. They fit on one single page with various “branches” radiating out from a central idea, with twigs off the branches highlighting subideas. Some mind mappers believe that the maximum amount of branches should be six to eight. Others design intricate branch structures with many subdivisions.

“One simple way to understand a mind map is by comparing it to a map of a city,” says website mind-mapping.com. “The city center represents the main idea; the main roads leading from the center represent the key thoughts in your thinking process; the secondary roads or branches represent your secondary thoughts, and so on. Special images or shapes can represent landmarks of interest or particularly relevant ideas.”

Make your own mind map

Colors are necessary because they add vibrancy to our intuitive understanding of a map. Plus, the more pictures, images and drawings are included the better; and the stranger a picture is, the easier it is to remember. For example, a much-used emoticon like a yellow smiley is far more forgettable than a hand-drawn, rainbow-colored thumbs-up.

So how do you get started on a mind map? Well, first, it might be advisable to draw some of the maps by hand, as it could help you get a handle on how the

**250
MILLION**
the amount of people
said to be using mind maps
worldwide



map structure works. As you work out the central idea and the content of the branches, you begin to think the issue in question through rigorously. It also teaches discipline as you have only one single page on which to fit the most important elements. That alone is a very helpful strategy for sorting through all kinds of problems.

For those unable to draw even the simplest stick figure, a number of online software tools are available, such as those from IQ Matrix. Most usually have either a free basic version or a free trial period. For more advanced mind mappers, these tools offer possibilities to collaborate online.

If you're still skeptical about the power of a mind map, consider this: Jens Voigt, a German teacher-turned-mind-mapper, tells the story of how he once asked a 12-year-old student to wait outside his office and study a mind map of the life of composer Wolfgang Amadeus Mozart which had been left behind by a lecturer.

When Voigt called the student in five minutes later, he was completely astounded by how much the boy recalled of the life of a composer he had never even heard of before. "I started to mindmap myself and my students love it because it makes learning so easy for them," Voigt says. That sounds like an impressive recommendation. And apart from anything else, who knows? It might even help you start thinking like Sir Richard.

■ Margaret Heckel

VIEWPOINTS



DELIVERED. GOES OUT OF THIS WORLD WITH...

REINHOLD EWALD

Astronaut Reinhold Ewald talks about his time in orbit, the challenges of space logistics – and how, despite all his achievements, he manages to keep his feet firmly on the ground.

Millions of children around the world look up to the stars and dream of traveling into space. In his youth, Reinhold Ewald was no different.

Yet Ewald ended up living that dream. He became an astronaut and, in 1997, flew to the (now de-orbited) Mir space station, staying there for 18 days to carry out experiments in biomedical and material sciences.

“I was always a fan of science fiction,” says the German-born physicist and PhD who, after university, became a radio astronomer and space rocket manager at DLR – the German Aerospace Center in Cologne. “As a young man I read all the books by Isaac Asimov and Arthur C. Clarke, and I studied physics because I wanted to solve the big riddles of the universe.” So when he saw the chance to become an astronaut, he took it immediately.

Competition

The competition, however, was fierce: Ewald was one of 1,300 people who applied to be part of the German astronaut team and he is still thankful he got the job. “I made it to the final round where 13 of us were interviewed,” he said. “Of those, nine of us made it into space. It’s an individual tragedy if you don’t make the cut, but there’s a lot of talent out there.”

He began his astronaut training in Moscow in 1990, but points out that most lessons took place in the classroom. “You’re not being hauled up by helicopters all day or taking trips on a centrifuge every 30 minutes,” he says. “People overestimate the ‘adventure’ part. That only takes a few weeks and includes preparing to land on water, or landing in winter beyond the reach of search and rescue teams.”

When he finally got to Mir, one of his proudest achievements was using his own body to conduct a ground-breaking life sciences experiment. “I had a completely controlled food and fluid intake,” he says. “Every



calorie, every mineral, every atom that I ate and secreted was counted. This led to a new theory about how the body stores sodium under certain conditions.”

In 1999, with his feet firmly back on the ground, Ewald joined the European Astronaut Corps at the European Astronaut Centre in Cologne, supervising preparation and flight operations for the first long-duration mission of European Space Agency (ESA) astronauts to the International Space Station (ISS) program, a global partnership of 15 nations. He also led the operations management team that delivered the Columbus laboratory – the first permanent European research facility in space – to the ISS in 2008: a big logistical challenge.

In 2015, he was appointed Professor for Astronautics and Space Stations at the University of Stuttgart’s Institute of Spaceflight Systems. “The only problem is that students can Google anything these days,” he laughs. “So if I tell them that the moon is 380,000 kilometers away from Earth they’ll tell me that it’s actually 384,400 kilometers away. So they don’t want me to give them data. They’re more interested in my personal experiences.”

18

The number of days that Reinhold Ewald spent on the Mir space station

Let's go back to 1997. You're sitting in the Soyuz capsule ready for launch. How do you feel? Scared?

I was more concerned that there might be a setback and we wouldn't be able to go. I had been working towards that moment for a long time. My family had made sacrifices and the technicians and engineers had been preparing the mission for years, and I had no doubt that it was the right thing to do – so I didn't want to have to redo the whole process. I don't think any astronaut sitting in a rocket just before launch thinks: "I'd rather not go today. I need time to rethink."

You faced a frightening challenge on Mir when a fire broke out.

Yes, but at that point I thought: "Well this is just unfair." I had changed my life to go into space and then it seemed as though the mission was in danger of being cut short. Actually, while the fire did create difficulties, it also made us closer as crew members. We put on gas masks and worked together to extinguish the flames. The culprit was found to be an oxygen candle (burned to generate supplemental oxygen) which we brought home with us. I've never heard conclusively why it exploded, though...

Did you take anything into space with you?

I prepared a selection of music on a 90-minute cassette. That's just the right amount of time to orbit once around the earth, and I wanted to broadly match the music with the continents I would be flying over. So there was some local music from Cologne, as well as music from Africa and South America. I took some Mozart for Europe and Alexander Borodin for the steppes and deserts of Central Asia. It was hard to find something for Australia though. I thought didgeridoo music would be too calming.

Were you ever overawed by being in space?

You only feel the impact of the mission afterwards. Now I imagine myself floating through the space station. Another thing I remember is the smell when I was passing along the metal of the docking port, because it had been exposed to space for some time. That was very distinctive. On a second mission I could probably appreciate these moments; but at the time I was so focused on my work because I didn't want to leave a single task unfinished.

HANDS ON:
Reinhold Ewald's
spacesuit glove
and watch.



15

The number of countries involved in the International Space Station Program: U.S., Russia, Canada, Japan, Belgium, Denmark, France, Germany, Italy, Netherlands, Norway, Spain, Sweden, Switzerland and the U.K.

When it was over was it difficult – metaphorically speaking – to come down to Earth?

That's a danger for everyone returning from their first flight because people are more interested in you as an astronaut than you as a person. Then again, you become an ambassador for humanity's future in space and you've been through a lot and proved yourself. So, yes, there is pressure on astronauts – but as educated scientists we're not 18-year-old soccer players.

As part of ground control, what are your feelings as the rocket leaves the launchpad – and you're not on it?

I feel part of the team. It's always emotional when we launch a payload of cargo, and even more emotional when we launch our friends into space. On the other hand, I've had my fun time. I'm happy that young professionals are part of the astronaut teams and get to have the same exciting experiences that I had.

Would you be willing to go into space again?

There's no natural age limit: John Glenn travelled into space at the age of 77. But it's important to bring in new people. And a second mission would need new thinking on my part because the value of what you can achieve in space always has to match the risk of going. If it was just about me reliving my experiences I would have to have serious conversations with my loved ones.

As someone who has been in charge of launching payloads to the ISS, can you give us an idea of the logistics involved?

Well, the real charm of the space station is that it's serviced by many independent vehicles and doesn't have to rely on one common carrier. The Russian Progress craft can deliver up to 2.5 tons of cargo, there have been five European ATV carrier missions to ISS, and the Japanese Agency regularly sends up their HTV cargo freighter. The backbone of logistics for the ISS, however, will now be the COTS program – the Commercial Orbiting Transportation Systems – funded by the U.S. This means that private U.S. companies are now able to provide a regular flow of cargo to the station under contract from NASA.

How important have these numerous carriers been in logistics terms?

They have been key to the success of the ISS. Without them, there would have been long stretches when the station was without a crew or cargo deliveries. Actually, we can take up to two losses of cargo vehicles and the crew on the ISS will still have enough crucial supplies. We've

STAR MEN:

Reinhold Ewald (left) in training with fellow cosmonauts Klaus-Dietrich Flade (seated) and Tolgat Mussabaev. All flew to Mir on separate missions.



“I don’t think any astronaut sitting in a rocket just before launch thinks: ‘I’d rather not go today. I need time to rethink.’”

Reinhold Ewald

also made changes to keep logistics needs down. For example, the Space Shuttle used to run on electric power generated by fuel cells, and left tons of water behind every time it visited the ISS. But now the shuttle is retired, so we have to recycle water on the station. That created some doubts at first – we’re talking about recycling urine, after all. But processed urine is pure H₂O!

Do you think we will ever find intelligent life on other planets?

No. If it’s easy to travel into space and span these distances between solar systems or even galaxies, why hasn’t intelligent life visited us yet? So it seems unlikely.

You’re still a lover of sci-fi. How difficult is it for you to take these films seriously?

Well, you don’t watch something like “Star Wars” to find out how to run a spaceship. But there are other categories of sci-fi films that try to be factual, such as “2001: A Space Odyssey.” For me, that’s the highlight of the genre. “The Martian” wasn’t bad. “Gravity” wasn’t to my taste. But when we’re at the cinema and I say: “Oh, no, you wouldn’t do that...” or “No, not that button!,” my family and friends always tell me to keep quiet. ■ Tony Greenway



www.esa.int

Social Supply Chain Management

Social supply chain management seeks to incorporate the social network, social interactions and social data to enhance relationship management with all stakeholders, in order to maximize value in the final market place at less cost to the supply chain as a whole.

AN ESSAY BY PROF. DR. RICHARD WILDING OBE

Richard Wilding is Professor of Supply Chain Strategy at Cranfield School of Management, U.K. He was appointed Officer of the Most Excellent Order of the British Empire for services to business by Queen Elizabeth II, and specializes in supply chain strategy, resilience, and techniques for aligning supply chains to maximize customer value and reduce cost.



Fueled by the success of social media among consumers, social collaboration tools have begun appearing in the world of business, within supply chains. According to their proponents, social collaboration can transform the working of modern supply chains.

Workflow within supply chains has traditionally followed organizational structures and relationships. From order acceptance to fulfilment and dispatch, activities are broken down into logical steps, and passed between functions such as sales, production, and distribution.

So too with communications, which are directed to a particular person or function. To employ the metaphor of the telephone, there must be a number to dial; or in email or “snail mail” terms, an address. The socially enabled supply chain either sidetracks this, or adds a collaborative layer that sits quite outside normal organizational reporting structures. Instead of the telephone or mailbox, it functions rather like a student noticeboard.

But it is a student noticeboard that is technology enabled: problematic orders can be “followed,” “liked” or “tagged,” bringing any subsequent relevant information directly to the follower’s attention. Digital imagery enhances communication, too. In an era

where camera-equipped smartphones are ubiquitous, capturing and posting an image of a damaged pallet or misplaced consignment is the work of a moment.

At Cranfield School of Management, we’ve been able to study the social supply chain within two real-world supply chains. Together, they straddle all four communication modes of the social supply chain: one-to-one, one-to-many, many-to-one, and many-to-many.

The first environment is Travis Perkins, a FTSE 100-listed builders’ merchant and home improvement retailer, with brands that include Travis Perkins, Wickes and Toolstation. Here social collaboration takes the form of “virtual communities” within the firm’s 200+ outlet Wickes DIY estate, powered by Google+ Communities, a social media collaboration tool.

One such community, Availability+, is focused on improving on-shelf availability within Wickes stores, linking together store-based personnel with personnel drawn from functions such as inventory control, marketing, distribution and logistics, purchasing, quality and merchandising.

The second socially enabled supply chain is that delivered by 2degrees, a specialist firm delivering supplier collaboration communities on behalf of businesses as diverse as Asda, phar-

maceutical giant GSK, Kingfisher, and the Irish food board Bord Bia. 2degrees enables businesses to leverage their supplier base to fulfil goals that would rapidly exhaust corporate bandwidth if tackled through conventional means. At Asda, for instance, a many-to-many community of suppliers, known as the Asda Sustain and Save Exchange, focuses on sustainability and cost efficiency, with 2degrees facilitating communication and knowledge sharing.

That said, the use of social tools within supply chains will not automatically be a success. For all the enthusiasm about applying social collaboration tools in a business context, success is far from certain. Why? Because the social supply chain operates through a combination of both flattening the organization structure, and simultaneously weakening the walls of its silos. In other words, it works precisely because it enables individuals to communicate without going through “proper channels.”

And the more hierarchal and rigidly structured an organization, the more resistance there will be to this. Moreover, for social collaboration tools to succeed, their usage has to be ubiquitous – even among individuals who may be reluctant to engage with social tools in a personal, consumer-centric context.

That said, five basic rules can help to maximize the potential for success.

1) For the social supply chain to be effective, content, scale and culture are key.

At Wickes, using Availability+ is not mandatory. Likewise, suppliers within the Asda Sustain and Save Exchange are similarly under no coercion to use it. In both cases, people do so because the virtual community helps them to perform their jobs better. And as a result, it is important not to be too directive about how people use such communities. Inevitably, this involves ceding an element of control, and empowering people with the freedom to make decisions, raise problems and provide solutions in the manner that they think best.

2) Properly implemented, the social supply chain is more effective than other communication channels.

At its simplest, the social supply chain connects people who have a problem – or who need information – with other people who can resolve their problem or provide the required information. Critically, they don't need to already know and have a relationship with these people. All they need to know is that they can simply post a message, and someone will respond. In other words, they are getting to the right person, automatically. Within both Wickes' Availability+ virtual community and the Asda Sustain and Save Exchange, this has had a transformative impact. Because communication is so straightforward, and the resulting replies so rapid, individuals are much more likely to initiate communication, or participate in online discussions, seeing it as a way of time-efficiently getting their jobs done.

3) The social supply chain's “many-to-many” communication transcends the traditional vertical approach.

Traditional communication approaches are silo-based: a query raised at the bottom of one organizational silo must travel upwards before it is appropriate for it to cross to another silo for actual resolution. The social supply chain dispenses with this model. Within Asda's Sustain and Save Exchange, for instance, the whole point is that (say) an engineering manager within one supplier can engage directly with the engineering manager of another supplier, in order to share experiences and insights into (say) low-energy lighting, heat pumps or energy-efficient compressors.

4) The social supply chain is public, with no place to hide.

The social supply chain is public, so posts made by users are visible to the whole community. Issues are raised in a corporate public forum, open for all to see, with the speed and effectiveness of any resulting resolution also open for all to see. As in the physical one-to-one context, this encourages people to respond fully and effectively to any questions and issues raised, knowing that their peers – and their superiors – are viewing their online actions and the speed and efficacy of the responses that they make.

5) Social supply chain communication is two-way, not just one-way.

A significant advantage of the social supply chain is that it unlocks a powerful medium for two-way communication, quite outside the normal protocols and circulation lists associated with conventional organizational communication paradigms and workflow. A supply chain director, for instance, would not normally expect to be privy to reports from the front line in terms of delivery reliability, stockouts, damage and the effectiveness of promotions. At Wickes, for instance, Availability+ has made it possible to get near real-time feedback on how a given promotion is working, in terms of identifying the best-selling items, and any opportunities to fine-tune and improve it. Best practice can then be distributed community-wide, all within a matter of hours.

In summary, Facebook and Twitter are barely a decade old. And even today, some voices doubt that they will have long-term staying power. Inevitably, the prospect for social supply chain initiatives is even more fragile.

That said, these five basic rules should help your social supply initiative to succeed. ■





WHAT'S THE STORY, MR. CORONEL?

A DRIVEN MAN

Dutch racing driver Tom Coronel talks about the 2016 World Touring Car Championship and why he approaches it – and life in general – at high speed.

I've been obsessed with cars and racing all my life. My grandfather was a famous motorbike racer in Holland; my dad, Tom Coronel Sr., was a racing driver – he first met my mum on the racetrack, actually – and my brothers are racing drivers. The clue is in my middle name. My twin brother is called Tim Alfa and I'm Tom Romeo. So when we're sitting around the table, we don't talk about horses or tennis.

I learned to drive when I was 10 years old and I was caught by the police driving alone when I was 12, which made the newspapers. I was so small they couldn't see anyone sitting in the car. I got into trouble and was banned from driving for three years, which was stupid because you have to be 18 to drive legally in Holland!

Turbo-charged

Now I love the thrill of driving touring cars, which look like road cars but are a lot more aggressive, both in terms of power and response: they do what you want them to do in an instant, and they're very sharp and edgy. A touring car has a 1.6-liter turbo-charged engine with 380 horsepower. Put it like this: if you're sitting next to me when I brake in my Chevrolet RML Cruze, you'd have your nose against the windscreen.

I'm really looking forward to this season's FIA World Touring Car Championship (WTCC), where I'm driving for Roal Motorsport. I want to be on the podium at least four times. I'm expecting to do well at the Twin Ring Motegi in Japan in September. I feel at home in Japan. I lived there for five years and was very successful, winning Japanese Formula 3 and Formula Nippon. The speeds we reach in touring cars depend on the circuit, but in Shanghai I can do 267 kilometers per hour (165 miles per hour). I've had the same car for two years, but it's now two seconds faster. That's because we constantly tweak it to make it perform better. Every time we think we've reached the limit of what it can do, we go past it.

To be a successful touring car driver, you have to compete against yourself, the chassis, the corners and the other drivers. You need to

FACT: Notable wins for Tom include Japanese Formula 3, the Marlboro Masters (both in 1997), the Formula Nippon Championship (in 1999) and the 2006 and 2009 World Touring Car Championship Independents' Trophy.

165

mph. The top speed of Tom's Chevrolet RML Cruze touring car

24

The number of races in the World Touring Car Championship

be clever and very aggressive and when you see a chance you have to take it. In Formula One races, the cars can't make contact. In our championship, they can – and they do. Rubbing is racing! In fact, after the race, if my mirrors are still on the car, there are no scratches on the side, and my front and rear bumpers are still in one piece, my team boss will say: "Tom... you were racing today, weren't you?"

Expensive and exclusive

My heroes in this sport are people who drive with passion. For me, the greatest was Ayrton Senna. When he had his fatal accident at Imola in 1994, I was there, standing inside the pit box. I do consider how dangerous this job can be, but I've had no scary moments – although I remember driving at 343 kilometers per hour (213 miles per hour) at Le Mans and... wow! That was impressive! When I've driven above 300 kilometers per hour (186 miles per hour), I don't feel endangered, but I do respect it. The only thing is, if you did that speed every day it would become "normal," and you'd need to find another challenge. For example, I've bought a ticket to go into space when the first commercial space flights become available. Why? Because it's a thrill – and because it will be possible.

The cars we drive are expensive and exclusive – so they need to be exclusively treated. Logistics-wise, that's a challenge because I'm always racing mine somewhere on the planet. So it's good to be partnered with DHL who specialize in this kind of transportation and delivery. In Holland, because my car features the DHL logo, they call me "the fastest delivery boy." If I'm out having a drink, people will come up to me and ask: "What time is my parcel coming tomorrow morning?"

Letting off steam is difficult as I have a busy life. I have various businesses, and I've been commentating on TV on Formula One races for 20 years; plus I present a car program in Holland, which is like Top Gear. Talking about my passion and hobby comes very naturally to me. I'm experienced at what I do. I've been racing for 27 years – and of all the drivers in the WTCC, I've been driving the longest – but I feel as though I'm just starting.

Away from the track, I have two children: a nine-year-old daughter who likes riding motorbikes and a five-year-old boy who rides motorbikes and loves karting, which he started when he was three years and eight months old. That's not because I wanted him to do it – it's because he was asking to. They're not worried about what I, or their mum – Paulien Zwart, also a racing driver – do for a living. It's natural to them. I do slow down and relax when I'm with them and I love to teach them that there is more to the world than where we live in Holland. Overall, I'm very happy with my life – and how I've made my hobby my work. ■ *Tony Greenway*



FAST SPEEDS, HIGH DRAMA

The World Touring Car Championship, which has been running since 1987, features 24 dramatic races across the globe, with locations including the famous Nürburgring Nordschleife in Germany, plus tracks in Russia, Portugal, Argentina, Japan, China, Thailand and Qatar. Touring cars feature carbon-fiber parts, 1.6-liter turbo engines and six-speed sequential gearboxes. There are 11 teams and 20 drivers taking part in the 2016 Championship.



Margaret Zhang



Sarah Snyder



G-Dragon

DELIVERY – THE NEW COOL

Delivery has been making waves on the fashion scene recently, with a DHL T-shirt by Vetements making headlines as the epitome of urban chic.

One T-shirt and a select crowd of fashion influencers helped make the seemingly ordinary extraordinary. DHL's distinctive yellow-and-red brand opened the Spring/Summer 2016 show of Vetements in Paris with a T-shirt, smartly deconstructed by the French fashion collective's chief designer Demna Gvasalia – and took the fashion world by storm.

G-Dragon, Sarah Snyder, Nana Komatsu and Margaret Zhang – if you're not a millennial or the names mean nothing to you, then these numbers might surprise you: multi-award-winning Korean singer/songwriter and fashion icon G-Dragon, who sits in the front row of Chanel's Haute Couture shows, has 5.7 million followers on Twitter and a staggering 8.8 million on Instagram; Sarah Snyder, model and girlfriend of Jaden Smith, actor and son of Will Smith, has 645,000 followers on Instagram; Japanese actress and model Nana Komatsu has 619,000 Instagram followers; and stylist, writer and creative director Margaret Zhang runs a popular style blog and has 745,000 followers on Instagram.

Collectively these four style icons, together with editors at Vogue, GQ, The Guardian, Marie Claire – and even the Financial Times and Air Cargo Week, as well as many others, got millions of people talking about “The DHL T-shirt” – with debates going on as to whether a simple T-shirt sold at a whopping £185 was fashion fabulousness or the height of madness – and whether one couldn't just take a shirt off a DHL delivery guy.

Some DHL customers have started seeing their DHL courier in a new light, too. Debbie Goward, Global Head of Financial and Professional Services at DHL Express, says: “We have had very positive feedback. Customers in Hong Kong were especially interested after seeing that G-Dragon, who is a major star across Asia, wore the DHL shirt when he arrived at Seoul airport with his band Big Bang. We transport everything from export documents and designer samples to entire collections for the big shows, and we sponsor Fashion Week and new designers as part of our DHL Exported initiative – so it was great to see the DHL brand being recognized on the catwalk and achieving such recognition with celebrities, fashion editors, our customers and our DHL teams.”



Khaled El Desoky, DHL Kuwait (spare time parkour and freerunner.)

8.8 MILLION

The number of Instagram users following fashion icon G-Dragon

Vetements' Demna Gvasalia, now also chief designer at Balenciaga, must be enjoying the debate. The Vetements collective wants to go against the fashion grain and plays on “real clothes, carefully deconstructed or worn back to front and upside down.”

Actually, “cool” isn't a cool word to use for the DHL T-shirt – it's “dank” (“awesome” for non-millennials) according to Archie Lennard, a young London-based trendsetter who much admires the Vetements style. Lennard picked up items from DHL's online merchandising shop to create his very own look – which follows Vetements' design ethos to be an individual and have your own style.

“Being down to earth is the new black,” commented Demna Gvasalia in Vogue on the collective's approach to fashion. “Previous fashion was about making a dream. I feel like younger generations are much more pragmatic about it, and I think this pragmatism is quite necessary.”

And DHL's own teams – who wear their uniforms with pride – agree.

Cathrine Stenshagen, Customer Accounting Manager, DHL Norway comments: “Not only do I work for the greatest company in the world, we are now also a fashionable brand. I do not need to buy a T-shirt. I get to wear it, as I have put heart, dedication, passion and hard work into my job every day since my first day at work 12 years ago.”

Kenyan couriers Jackline Wamaitha and Felix Keter say the brand is recognized everywhere they go. “It is great to see our brand receive more recognition on the catwalk,” says Wamaitha. And Keter adds: “The colors on the uniform make us stand out. I feel like I am walking on top of the world when I make my deliveries!”

And from French fashion capital Paris, courier Philippe Colard adds: “I've been with DHL for 20 years and I'm still so proud to wear DHL's colors. When I learned that the famous brand Vetements had created a DHL T-shirt, I immediately thought, “This is great!” I am privileged, because I don't need to buy this new T-shirt to be fashionable, I wear one every day!” ■ Michelle Bach



See DHL teams style their uniforms:



tinyurl.com/DHL-shirt

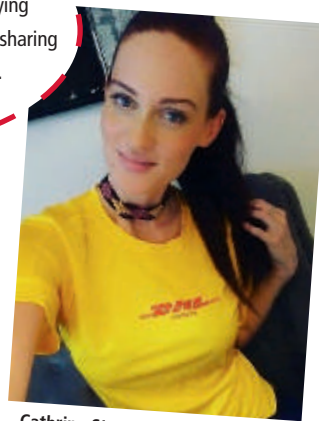
Ever since I started working for DHL Express in 2004, I've been carrying its colors with passion and pride. I love sharing "DHL Yellow" with other people.
Unsal Ur, Istanbul, Turkey



Seeing the DHL logo being regarded as a fashion statement and an icon for being trendy makes me feel proud and stylish.
Radhakrishnan Unny, Dubai, UAE



DHL is known all around the world. But the fact that we are lucky enough to be represented on the international catwalks with a famous logo makes it even cooler.
Daniela Dreissig, Leipzig, Germany



Cathrine Stenshagen, Oslo, Norway



Ovie Prince, Lagos, Nigeria



It's pretty amazing our brand is hitting the catwalk! I certainly feel more fashionable now!
Feraaz Buksh, Sydney, Australia (with Phil Bonning)



Philippe Colard, Paris, France



Karl Renner, Vienna, Austria



The colors on the uniform make us stand out. I feel like I am walking on top of the world when I make my deliveries.
Felix Keter, Nairobi, Kenya



It is great to see our brand receive more recognition on the catwalk.
Jackline Wamaitha, Nairobi, Kenya



Clint October, Cape Town, South Africa





Archie Lennard, London



Official Logistics Partner

Albums sold 240 million
Concerts played 2,106
Live audience 45 million+
Years of band history 54
Exhibition artifacts 550
Costumes from world-leading designers 70
Artworks and photography 160
Continents collected from 3
Freight in cubic metres 1,140

**As Official Logistics Partner we know:
Great is in the detail**

dhl.com/InMotion

