



Delivered.

THE GLOBAL LOGISTICS MAGAZINE

ISSUE 04/2015

BUSINESS

GROWTH MARKET

Discover the reasons behind India's business success

SOLUTIONS

LOOK SMART

Explore the future of wearable tech

VIEWPOINTS

WORLD CLASS

Meet Salman Khan, the Internet tutor inspiring millions around the globe

FOCUS

CHANGES IN THE PIPELINE

How the energy sector is meeting the challenge of low oil prices





DEAR READER,

Some time ago we asked the question in *Delivered*. why India and other BRICS countries were not rising out of China's shadow. This year, India may actually overtake China and become the world's fastest-growing major economy, which is why in this issue we are taking a closer look at what fuels this growth and how the country's Prime Minister, Modi, is faring with a range of initiatives designed to boost business.

The energy sector is no stranger to cycles. The recent dramatic fall in the price of oil, however, has prompted a rapid shift in focus across the sector. Our focus story explores how companies are having to come up with new strategies that allow them to continue thriving and what role logistics can play in helping them master the new environment they find themselves in.

Extracting fossil fuels is a complex task. Melissa Bohannon, Director of Logistics, Global Supply Chain at Weatherford, one of the world's largest oil field service companies, explains what it takes to help oil companies drill, construct and operate wells in some of the most challenging environments across the globe and why smart supply chains and flexible logistics are key.

Studying supply chains is his life's work – prominent supply chain expert and thought leader, Dr. John Gattorna, talks to *Delivered*. about his passion and his latest thinking in the field.

Enjoy your read!

Sincerely,

Bill Meahl
Chief Commercial Officer, DHL



04 NEWS

FOCUS: ENERGY

- 08 Reflection Time for the Energy Industry**
How the energy sector is adapting to a new price environment
- 14 Favorable Winds**
Meeting the logistics challenges of the renewable energy sector
- 16 Keeping the Pipelines Open**
Melissa Bohannon, Director of Logistics and Trade Compliance at Weatherford, on her company's complex logistics needs
- 19 Offshore Efficiencies**
Optimizing offshore logistics

BUSINESS

- 20 Innovation on Track**
Ideas that could help the freight rail industry speed into the future
- 22 Riding High**
Why is India currently a great place to do business, while other BRICs are faltering?

SOLUTIONS

- 26 Flying Solar Around the World**
Solar-powered plane Solar Impulse 2 is making high flying aviation history

PUBLISHED BY DEUTSCHE POST DHL HEADQUARTERS

Represented by
Prof. Dr. Christof Ehrhart
EVP Corporate Communications
& Responsibility

Anita Gupta
SVP Global Media Relations

Editor-in-Chief
Michelle Bach
(michelle.bach@dhl.com)

Editor
Tony Greenway

Project Manager
Sarah Ley

Editorial Assistant
Lochumbeni Yanthan

Contributors
Simon Barker, Ian Bremmer,
Ian Halstead, Bill Hinchberger,
Angela Singleton, Jonathan
Ward



A NOTE FROM THE EDITOR

If you regularly read *Delivered.* you will have noticed that aside from logistics solutions and global business matters we like to feature people who stand out and make a difference in their field. Salman Khan is one such individual. A former hedge fund manager, he turned teaching math to his cousins with the help of homemade videos into an idea for a free online academy that, to date, has delivered over 400 million lessons to students around the world. Don't miss our interview with Salman and learn more about the incredible global success of the Khan Academy. *Michelle Bach*

Salman Khan, founder of the Khan Academy, talks to *Delivered.* on page 34.



28 Joining the Dots

Supply chain expert Dr. John Gattorna reveals his latest thinking on logistics

30 The Almost Bionic Man

A look into the future for wearable technology

32 Time for a Digital Detox?

Our constant reliance on gadgets can have a downside

33 Pulling the Levers of Success

Levers to boost a chemical company's bottom line

VIEWPOINTS

34 *Delivered.* Learns a Lesson with...

Salman Khan, founder of free online learning resource Khan Academy

36 How to Lead in Ambiguous Times

An essay by Ian Bremmer, President of political risk research and consulting firm Eurasia Group

38 What's the Story, Mr Brown?

Harlequins and England rugby player Mike Brown on hopes for Rugby World Cup 2015



The icon above indicates additional online resources.

Address
Deutsche Post DHL Group
Headquarters
Charles-de-Gaulle-Strasse 20
53113 Bonn, Germany
Tel. +49 (0) 228-18 20

Commercial Register No.
Registration court Bonn
HRB 6792

Turnover Tax ID No.
DE 169838187

Website
www.delivered.dhl.com

Editorial Production
G+J Corporate Editors GmbH
Stubbenhuk 10
20459 Hamburg

Project Manager
Birte Kleinebenne

Art Direction
Christina Götsche

Paper
This magazine is made from
100% recycled paper.

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

FSC PLATZHALTER



KEY TO THE KINGDOM

DHL Express has opened a new \$20 million air/ground operations facility at King Khalid International Airport in Riyadh, the second of three new facilities planned for Saudi Arabia with a total investment of more than \$95 million. Spanning an area of 12,000 square meters – which is equivalent to 1.5 soccer fields – it has 4,700 square meters of indoor sorting and loading space with room for up to 36 courier vans, giving more security to customer shipments. The center – which will also act as DHL's new head office in Riyadh, Saudi Arabia – will give even better transit times and network reliability for the region, with a new network flight plus the continuous use of commercial flights that bring in 7,500 shipments daily.

Geoff Walsh, Country Manager for DHL Express Saudi Arabia, commented: "This is a proud moment for us. Our development in our capacity and network will allow us to meet the growing customer demand for fast and efficient shipment deliveries. The new facility will reduce the transit times by a day or two and will allow us to increase our flight capacity and schedules by 400 percent, therefore boosting customer satisfaction."



tinyurl.com/del-operations



SELF-DRIVE LUXURY FOR MERCEDES-BENZ

San Franciscans got a glimpse of the future recently when Mercedes-Benz brought its driverless concept car, the FO15 Luxury in Motion, to town. Although it was transported to the City by the Bay on a trailer for a photo shoot, many people spotted it driving on the streets and posted their own pictures on social media. However, no one knows who – if anyone – was inside it.

INSPIRATION FOR THE LONG HAUL

Self-driving vehicles are increasingly seen as a way of making long-haul road transportation cheaper, safer, more efficient and kinder to the environment. Now Daimler is testing a prototype it hopes will be the world's first autonomous truck. The Freightliner Inspiration – based on a widely used 18-wheeler semi – will only take control when cruising on the highway, with forward sensors keeping it in its lane and at a safe distance from traffic ahead. The company says the Inspiration should be on the roads for real within a decade.



\$108,000,000

The amount that DHL Express will be investing to expand its facility at the Cincinnati/Northern Kentucky airport (CVG) in Ohio, USA – raising total investment in the hub to \$280 million since 2009.

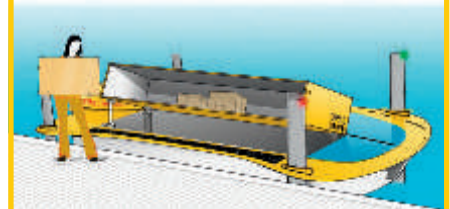


THE NUMBER OF PARTS MADE FOR THE AIRBUS A350 XWB JET USING 3D PRINTING

THE STORY

BLUE SKY THINKING

How about this for a shipshape design? An autonomous hydrofoil electric boat has won DHL's inaugural Blue Sky Transport Design Award – a global competition calling on the public to design sustainable, electric transport solutions for private, public or commercial use.

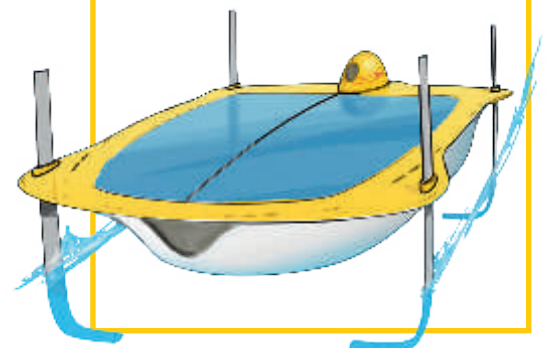


Called Water Strider, it's capable of carrying up to five cubic meters of cargo via a country's existing waterway system, making better, more effective use of current infrastructure while taking advantage of modern electric vehicle technology and design to improve performance and carbon efficiency. The boat – inspired by the vision of the FIA Formula E Championship, the world's first fully electric racing championship – was created by transport design graduates Philippe Hohl-feld and Oliver Lehtonen, and its prototype was unveiled in June in London.

Water Strider was one of more than 50 entries to the Blue Sky Transport Design Award from across the globe, which was judged by world-leading transport designer, Paul Priestman. Aspiring designers and engineers from as far afield as Australia, China, Russia and the UK submitted ideas ranging from self-driving cargo vehicles for passenger or cargo transport and hybrid airships to railway systems integrated with a city's tree infrastructure.



tinyurl.com/del-design



NEW SERVICE FOR CHINA-EUROPE

DHL Global Forwarding has added a third service to its China-Europe multimodal network, with a new twice-weekly rail service between Zhengzhou and Hamburg. Taking 17 days, it offers both full container and less-than-container load options, reduces the same journey by sea by as much as 21 days, and is a more environmentally friendly option than airfreight.

TIN MEN HELP DELIVER

Flipkart, India's biggest e-commerce company, is using the expertise of Mumbai's dabbawallas – the lunchbox carriers who deliver 200,000 tiffin tins of hot food a day with a 99.99999% success rate – to help with often difficult "last mile" deliveries. The city's 5,000 dabbawallas now take Flipkart deliveries to customers' homes when they go to collect the lunchboxes.



CARBON-CONSCIOUS

DHL Global Forwarding has included a new carbon reporting feature on its web-based platform DHL Interactive, which will allow customers to calculate the likely CO₂ footprint of their shipments, which, in turn, could help them meet their own carbon reduction goals.



tinyurl.com/del-global-forwarding





COLD CALLING

The new European Good Distribution Practice (GDP) guideline puts transport of temperature-sensitive products under strict compliance requirements. This is one reason why DHL Freight has extended its services for temperature-controlled road freight shipments across Europe by adding three certified Life Sciences & Healthcare Competency Centers to its LTL (less than truckload) ColdChain network. The new LSH Centers in Lyon, Milan and Madrid have been included to better manage the risk of product damage and loss from temperature deviations in increasingly long and diverse supply chains, and to address growing demand from new life sciences and healthcare manufacturers in Southern and Eastern Europe. A further station in Budapest will be added to the network shortly.



tinyurl.com/del-temperature



The length of the DHL Freight Germany long-liners being trialed by network partner Scherbauer for BMW, for shipments three times a week between facilities in Neutraubling and Leipzig. Awesome.

LIVING RESPONSIBILITY



A BOOK FOR SENEGAL

Education is key to the future of the developing world, but all too often people have scant access to vital teaching materials. For one project in Senegal, DHL Freight came up with a novel solution – transporting an entire library to the west African country, free of charge.

DHL employees shipped a total of about 6,000 books, as well as teaching materials, computers, desks and toys from Barcelona to Palmarin, some 150 km south of the Senegalese capital, Dakar. The project, called “Un libro para Senegal” (A Book for Senegal), involved creating a 285-square meter public library, as well as a book bus that can travel to remote villages

to give children the opportunity to read. The project’s lead partner is the Spanish foundation Lluís Llach, whose mission is to provide economic, cultural and educational support to the disadvantaged.

Ricardo Arroyo, former Managing Director of DHL Freight Spain & Portugal and now Managing Director DHL Freight Switzerland said: “Promoting education has been one of our top priorities for many years now. So for us there was no question that we would lend our support to the project.”



tinyurl.com/del-education

MORE FROM DOOR-TO-MORE

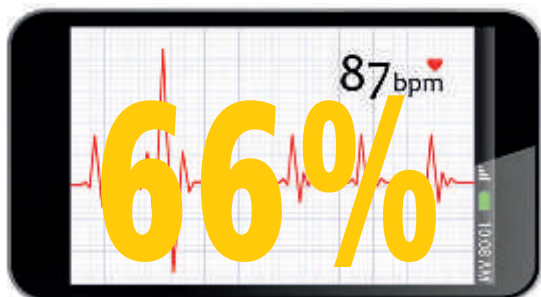
DHL Global Forwarding, Freight (DGFF) and Post eCommerce Parcel (PeP) have expanded the DHL Door-to-More service so that customers can send both parcels and freight from Asia to Europe's consumers directly. The new service – which transported a consignment of customized denim jackets for its test run – allows customers to fly a consolidated shipment of goods from Asia to Europe, which are then split down and sent to each addressee by DHL Parcel in different countries.



TIMING IS EVERYTHING

The final assembly of Airbus A320 airliners is a precise business, so the European aircraft giant needs to ensure that component parts reach its newly built plant in Mobile, Alabama, in time. DHL Industrial Projects has developed a multimodal transport concept to allow large aircraft components (some weighing up to 30 tonnes each), as well as 1,000 sea freight containers and air freight shipments, to reach the US within Airbus' 29-day transit window.

 tinyurl.com/del-AirbusA320



The percentage of Americans who say they would use a mobile app – be it on a smartphone or new wearable tech – to manage their health.
Read more about wearable tech in our article [The Almost Bionic Man](#) on page 30.



ACROSS THE BORDER

Seventy-eight percent of Mexico's trade goes to the United States, which is why DHL Global Forwarding has launched a new trucking service between Mexico and the US – called Trans Border Connect – which reduces journey times by six to eight hours, offers preferential rates and also ensures better safety. Running from Mexico City to Queretaro and from there to Nuevo Laredo (*), through the border into Laredo and Detroit, the service will offer a weekly return route, with a fixed itinerary and can carry up to one cubic meter or 100 kilograms of goods.

REDS REACH OUT TO CHINESE FANS

FC Bayern Munich has scored for their 90 million Chinese fans with the launch of a new official online store, in collaboration with China's leading online retail platform Tmall Global and DHL eCommerce. With a click, Chinese fans can now order all official merchandise, including FC Bayern Munich jerseys featuring their favorite player's name to genuine apparel for men, women and children.

 tinyurl.com/del-BayernMunich



WINE INFO UNCORKED

Wine production is a major export market around the globe, which is why DHL Express has developed an information booklet to assist wine exporters. Called the Wine Shipping Guide and covering more than 60 countries across all continents, it provides detailed information on customs duties and taxes, license and permit regulations, documentary requirements and specific country restrictions that apply to the importation of wine. We'll drink to that.

 tinyurl.com/del-wine-shipping





REFLECTION TIME FOR THE ENERGY INDUSTRY

Price falls are driving a rapid shift in focus across the energy sector, from maximizing output to minimizing costs. Now companies must find the strategies that will allow them to thrive in this new world.



POWER DOWN:

A worker at a gas drill in the Niger Delta. Natural gas drilling rigs have been in decline and could decrease further unless natural gas prices recover.



DRILL SEEKERS:

Fracking – which allows access to a vast reserve of previously unobtainable oil – has boosted supply and pushed down prices in recent years.

production quickly and cheaply. Meanwhile the main Middle Eastern producers are still ramping up production, says the report, and “pockets of supply growth are emerging from newer, developing market producers,” including Brazil, China and Malaysia. Overall, global crude oil supplies were up by 3.2 million barrels per day in April, compared to the same month last year. On the demand side, meanwhile, changing consumer habits and more efficient vehicles and industrial processes mean the global economy is less thirsty for oil than it used to be, and inventories of oil products are reaching record levels worldwide.

Supply chain reaction

In mature markets, the industry’s response to a price fall usually occurs in three distinct phases, says Campbell. “First, companies do nothing and hope the price recovers pretty quickly. Second, they start a program of headcount reductions and look to squeeze cost out of the supply chain by asking their suppliers for steep discounts. Finally, they have to search for major efficiency improvements.”

There’s plenty of evidence that the industry has passed the first and entered the second stage of its response. A report released in late 2014 by trade body Oil and Gas UK predicts that the UK upstream oil industry workforce will contract by 9 percent between 2014, and 2019, for example, driven primarily by a slowdown in capital expenditure. And Emilio Lozoya, CEO of Mexican oil giant Pemex told journalists in January that his company expects to save \$2 to \$3 billion this year in purchases and by cutting the rates it offers contractors.

As far as the third phase – efficiency improvement – is concerned, the industry is “not yet there,” says Campbell. “Until recently, the focus in oil and gas has been on time. Now cost is becoming the main driver and we see a big opportunity to improve efficiency, not just in upstream operations but across the whole sector.”

Those efficiency improvements will come from every aspect of energy companies’ operations, he suggests. “It’s a mind-set, thing, it’s about asking, for example, ‘is this component the best value for the job?’” Similarly, the industry will need to become much smarter about controlling capital expenditure,

Like many commodity industries, the energy sector has always been a cyclical one. But there is something about the latest price fall that has surprised even seasoned industry observers. “I’ve seen three major price cycles in my time in the industry, and this one has hit much harder and much faster than anyone expected,” says Brian Campbell, a director in the Capital Projects and Infrastructure Practice at management consultancy PwC. “And it’s now becoming clear that we aren’t going to have a V-shaped recovery. Low prices are going to stick around for a while.”

Predicting the oil prices is a dangerous game, but there are good reasons to expect prices to stay at relatively low levels in the near future at least. Demand for oil – especially in emerging markets – continues to rise. On the supply side, the emergence of unconventional “light tight oil” in the US, extracted by hydraulic fracking technologies, has transformed the established global order in recent years, boosting supply and pushing prices down as the oil industries of different regions seek to maintain their market share.

According to the International Energy Authority’s latest monthly report, there is little sign of significant tightening in supply in response to the low price of oil. Low prices have driven a fall in US activity, with the number of active rigs down by 60 percent. But one of the benefits of unconventional onshore oil and gas production is the ability to stop and restart

5.2
MILLION

The number of barrels of oil estimated to be produced per day by 2020

with more time and effort spent upfront “defining projects and understanding the risks,” before resources are committed.

One key area to address, Campbell suggests, will be labour productivity. “If you arrange your operations efficiently, individuals on a platform can deliver 10 hours of productive time in a 12-hour shift, instead of five or six,” he says. Driving up productivity in this way doesn’t just produce direct labor cost savings, it also helps operators save money in a host of other areas, from offshore accommodation to helicopter flights. Furthermore, large differences in productivity performance between operators today indicate that many have significant room for improvement.

To achieve these improvements, the industry could learn much from others such as the automotive or electronics sectors, that have done so much to improve their own operational performance in the face of intense cost pressures. “The lean and Six Sigma approaches that have worked so well elsewhere will be a key component in the drive for greater efficiency,” says Campbell.

In addition, oil and gas companies will need to consider flexibility alongside cost control as they adapt

“If you are going to enter an emerging market, you need to have the processes in place so you know exactly what steps you need to take.”

Brian Campbell, Director in the Capital Projects and Infrastructure Practice at management consulting company, PwC



HEADING SOUTH:

Low oil prices have hit the energy industry much harder and faster than experts predicted.

AIR SUPPLY:

Efficient operations – including the timely air transfer of workers – are a way to help drive up productivity.



UNDER CONTROL:

Outsourced supply chain “control towers” can manage the entire logistics approach for one site or a particular country operation.

to their new operating environment. Companies need ability to capture growth opportunities cost-effectively, for example. “If you are going to enter an emerging market, you need to have the processes in place so you know exactly what steps you need to take,” says Campbell. They also need to ensure that the hunt for short-term cost savings doesn’t threaten long-term value. As you make cuts, you lose physical assets such as vessels, onshore facilities and helicopters, and those are hard to get back when you

need them – but the biggest risk is the loss of talent. “If you are forced to cut your workforce by 15 or 25 percent, you can lose a lot of good people if you are not careful, and when you need them again you may find they have gone abroad, or moved into other sectors,” says Campbell.

Logistics opportunity

Accounting for around 10 to 15 percent of the operating costs of typical offshore oil and gas facilities, logistics is

DOWNSTREAM LOOKING UP

The impact of low crude oil prices isn’t spread evenly across the oil and gas sector. The price of oil products hasn’t fallen as rapidly as the raw material, for example, leaving extra margin for refineries and the suppliers of such products. The result has been an upturn in planned investment in these areas, says DHL’s Steve Harley, as companies seek to upgrade their facilities to boost productivity and further enhance their profits. Similarly, distributors of specialist oil products such as lubricants and plastics are upgrading their warehouses and supply chain facilities now, says Harley, both to capitalize on their improved short-term profitability, and to prepare themselves for longer-term changes. “In mature markets especially, consumption of oil products has plateaued and is expected to decline over the long term,” he adds. “And companies are preparing themselves for that.”

Once considered almost a by-product of oil production, natural gas is also faring much better in today’s market. Demand is up, especially in countries looking to find a less carbon-intensive replacement for aging and dirty coal-fired power stations. The distribution infrastructure associated with gas is changing too. In the past, the high cost of transporting gas long distances limited its consumption to local markets – and meant that much gas extracted in remote locations was just “flared” off at the point of production or reinjected into wells. Today, the investments in long-distance gas pipelines and the technology to liquefy the gas and transport by ship are making markets much more global. Australian companies have invested almost \$200 billion in liquefied natural gas (LNG) infrastructure in the past ten years, for example – with Asia their target market, while the first exports of US shale gas to Asia and Europe are expected to start later this year.



Photos: DHL, CORBIS, DHL

becoming another intense area of focus for operators. And again, there seems to be plenty to pay for. While there have already been some efforts to set up integrated logistics services where different operators run facilities in close proximity, for example, such opportunities have so far been “quite sporadic” in nature, says Campbell.

Now, says Steve Harley, President, Energy, DHL, many oil and gas companies are conducting “root and branch reviews” of their logistics networks in the hunt for cost reduction opportunities. “Existing operations are reducing their inventories,” he notes, “and rather than running a supply warehouse close to every site, companies are looking for consolidation points that allow them to share inventory between sites, even if that means storing them two or three days further back.”

In logistics too, oil and gas companies are now beginning to take on board supply chain approaches that have already come into widespread use in other areas. “Traditionally, the industry has looked to logistics service providers for freight forwarding activities,” says Harley, “But now there is increasing interest in more comprehensive outsourcing.” Approaches under consideration by several major oil companies today, he says, include the use of fully outsourced supply chain “control towers” to manage the entire logistics approach for one site or a particular country operation, as well as the use of globally consolidated, single-source solutions for logistics services. ■ *Jonathan Ward*

\$48 TRILLION

The amount of investment needed in the energy sector over the period to 2035, according to the International Energy Agency (IEA)

FUEL INJECTION:

Investments in long-distance gas pipelines and the technology to liquefy gas and transport it by ship are making markets more global (see Downstream Looking Up).

3 QUESTIONS FOR

Steve Harley,
President,
Energy, DHL



1. How are oil and gas companies reacting to low prices?

Companies expect oil prices to fluctuate – they always have – but there’s a growing expectation that the current period of lower prices will last for quite a long time. That’s driving a more significant and deep-rooted review of companies’ portfolios and operating practices than has happened for a long time. They are thinking hard about their investment and exploration plans and, especially in higher cost regions, they are reducing their inventories and consolidating assets and facilities, and they are looking to cut costs wherever they can.

2. Are there opportunities as well as challenges?

Of course! Companies that own lower cost sources of oil and those that can boost efficiency and reduce their operating costs will probably face less competition in the short term, and significant opportunities when prices eventually pick up. It’s also a good time for mergers and acquisitions. We’ve already seen some big deals among both oil producers and service companies. And, finally, there are pockets of opportunity across the sector, with both refining and LNG continuing to invest right now, for example.

3. What role does logistics play in the new energy environment?

Logistics is a big part of the operating cost for oil and gas companies, whether they are building production facilities offshore or in remote regions, or managing the complex logistics needed to support unconventional onshore oil and gas. The new focus on productivity and cost control creates opportunities for companies to transform their logistics performance, whether that’s through improved planning and scheduling, network redesign and optimization, collaboration and consolidation, or outsourcing.



FAVORABLE WINDS

As renewable power becomes an ever more important source of energy, installing and maintaining generation equipment creates some tough logistics challenges.

Modern renewable energy sources now generate about ten percent of the energy consumed by humans, but the fraction is growing fast. Global renewable power generation capacity passed 1,560 GW in 2013, according to international renewable energy organization REN21, an increase of 8 percent on the previous year. Moreover, 2013 was the first year that more than half of the new power generation capacity installed worldwide came from renewable sources. In the European Union, where renewable energy installation has outpaced the construction of conventional power stations for the past six years, the figure reached 72 percent. In China, meanwhile, new renewable capacity exceeded the construction of fossil fuel and nuclear power stations for the first time.

In the countries that have pursued renewable energy most enthusiastically, it now makes a truly significant contribution to national energy requirements. Denmark obtains a third of its electricity from wind power, for example, and Spain a fifth. In the first quarter of 2014, Germany met more than a quarter of its energy demand from renewable sources – and on some days that figure rose as high as 75 percent.

While government policies and incentives have been decisive in the growth of renewable energy so far, the scale and maturity of the wind and solar industries has brought prices tumbling down, to the point where renewables can often compete directly with their fossil fuel counterparts, even without government support. The US Department of Energy reports that the price of domestic and commercial solar photovoltaic installations fell by 5 to 12 percent be-

tween 2013 and the middle of 2014, for example, while the Wind Energy Foundation says that the price of wind-generated electricity in the US has fallen by 50 percent since 2009, and 90 percent since 1980.

Even the recent decline in global oil and gas prices has done little to slow the relentless growth of renewable energy. In part, that's due to political will. The leaders of the G7 group of rich nations agreed in June to phase out fossil fuel burning altogether by the end of the century, for example. And many countries are seeking long-term improvements to energy security and protection from volatile and unpredictable fossil fuel prices.

A mountain to climb

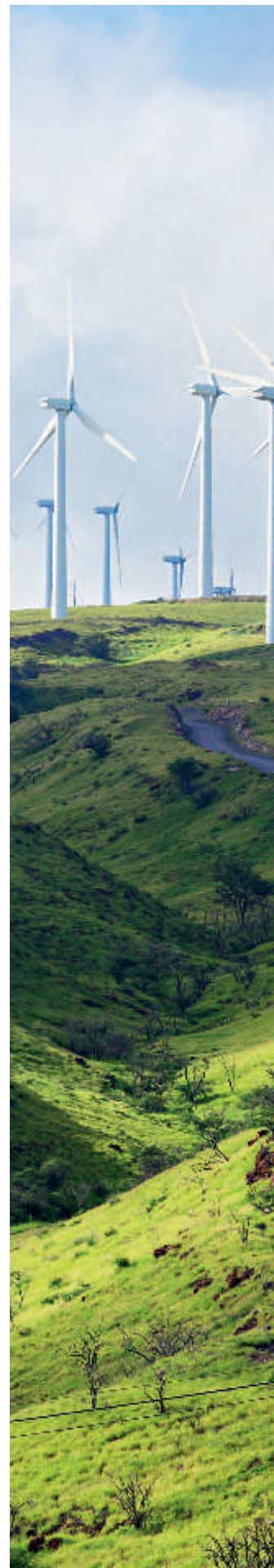
Whatever the rationale behind their renewable energy investments, utilities around the world are set to continue installing solar panels and wind turbines in large numbers of the coming years. And that's work that comes with particular logistics challenges.

"It's the nature of wind energy that the best sites are often in difficult-to-reach locations," says Tim Johansen, Head of DHL's Regional Wind Competence Centre in Denmark. "Often, that means high mountain locations with demanding weather conditions." For a significant minority of wind power projects, it can also mean working offshore.

Johansen and a team of six specialists in Copenhagen with DHL's project logistics division help to design, plan and execute the transportation of turbines, construction materials and associated equipment to sites during their construction. It's a business that has grown by 150 percent a year for the past three years, and which last year involved the management of 250,000 freight tonnes of equipment.

THE OFFSHORE WIND SECTOR

- There are approximately 7.7 gigawatts of offshore wind installations worldwide, with the majority of activity centered on northwestern Europe.
- Expanding projects are likely to contribute a record-setting 4.9 gigawatts in 2015 alone.
- China is quickly developing its offshore wind sector, having increased its market share to 45% in 2014, from 29% in 2012.
- Globally, the offshore wind market has been generally increasing: 2013 was a record year for new global offshore wind installations, with 1,734 megawatts added in seven countries.





80 METERS

The size of the blades of today's biggest offshore wind turbines

Photo: mauritius images / Pacific Stock

The key to this work, he says, is thorough and rigorous project planning. “When you are moving a 55-meter-long turbine blade up a mountain road with 11 to 15 percent gradients, there isn’t much room for errors.” To avoid those mistakes, wind farm logistics teams begin their planning up to a year in advance of the equipment installation date. They will assess every element of the logistics chain “from the marshaling yard to the mountainside.” They will drive the entire route, measuring corners and gradients, and looking for obstructions like road signs that may need to be removed to allow the load to pass. They also conduct a comprehensive health and safety assessment to identify potential risks to personnel or the public and the most appropriate mitigation strategies to tackle them. “Health, Safety, Security and Environment (HSSE) is an uncompromising pillar of any project we embark upon,” says Johansen. “Through a robust network of highly skilled and certified professionals, partners as sub-contractors and vendors, HSSE embodies our corporate commitment to ‘Zero Harm.’”

Specialist equipment

As a final step, around two months before installation, a team will complete a “simulated run” – taking an empty vehicle of the necessary size and weight along the full delivery route. “The simulation will be as close as possible to the real thing, so if the blade we are carrying will be longer than the trailer, we will mark its extents so we can be sure that the actual load can pass along the route,” says Johansen. The prearranged work is vital, explains Johansen, and part of a number of other aspects, measures and undertakings to minimize the change of days during the actual delivery sequence, when construction programs are running to extremely tight schedules and expensive cranes and skilled personnel will be on site waiting for components to arrive.

While the logistics for onshore wind turbine installations are challenging enough, offshore wind farms, which account for around 20 percent of the work of Johansen’s team, are even more complex. “The largest piece we had to move last year was for an offshore electrical substation,” he says. “It was a single piece weighing 1870 tonnes.” In tough marine environments the planning team has to juggle often unpredictable wind and wave conditions, he notes, as well as the need to bring specialist equipment long distances to complete the task at hand.

And as logistics specialists master today’s challenges, the industry is creating greater ones for tomorrow. A growing and increasingly diverse range of installed assets needs regular maintenance and periodic repair, for example. That requires companies to manage increasingly complex parts inventories, support personnel and logistics links in the same remote and inaccessible areas. In the quest for greater power and efficiency, meanwhile, turbines are getting bigger all the time. “Seven or eight years ago, we were handling blades 20 to 40m in length,” recalls Johansen. “Today’s biggest offshore turbines have 80m blades. That’s double the size and double the weight – it creates a huge increase in pressure on every part of the logistics process.” ■ Jonathan Ward



KEEPING THE PIPELINES OPEN

Weatherford is a global oil field services business that depends on fast, flexible and efficient logistics, says Melissa Bohannon, the company's Director of Logistics, Global Supply Chain.

With annual revenues of over \$14 billion and around 1,350 operating locations in more than 100 countries, Weatherford is one of the world's largest oil field service companies. It helps its customers drill, construct and operate oil wells as efficiently, reliably and safely as possible in the most demanding corners of the globe.

That's an increasingly high-tech business. As the industry seeks hydrocarbons in ever deeper and more remote locations, it puts extraordinary demands on the equipment it uses. The Weatherford IntegraLine liner system, for example, is designed to safely contain oil and gas at pressures of up to 103 Mpa (15,000 psi), temperatures higher than 200°C (400°F) and depths of more 7,600m (25,000 ft). The race to create solutions to meet the industry's continually evolving demands occupies the company's scientists and engineers in 14 R&D centers around the world, and Weatherford has a portfolio of more than 5,000 patents.

The company's business isn't just about the newest, deepest wells, however. Its people and its technologies also work to extend the life of mature assets, helping oil companies squeeze as much value as possible out of their existing wells, before finally decommissioning them in a safe and cost-effective manner.

Together, those activities create significant logistics requirements. Weatherford manufactures equipment in facilities around the world, and sources from many hundreds of others. The job of ensuring that the right equipment gets to where it is needed at the right time falls to the organization's logistics group, and to Melissa Bohannon, Director of Logistics, Global Supply Chain.

Organizational complexities

It's a role of considerable complexity. Weatherford conducts 20,000 to 30,000 freight moves every year in the US alone, for example. Cross border shipments, which account for 20 to 30 percent of overall logistics spending, are frequently made to regions with complex and highly fragmented customs regulations such as Africa, Latin America and the borders of the Caspian Sea. And the logistics challenges don't stop once Weatherford has moved its equipment to its destination. Equipment may operate on site for many years, with consequent requirements for extensive maintenance repair and opera-

tions (MRO) support. That requires the management of a parts database that comprises "between one and two million SKUs (stock keeping units)," says Bohannon.

There are organizational complexities too. Since its formation in the US in 1987, Weatherford has grown both organically and through acquisition. In recent years, it has focused on the creation of "One Weatherford" – turning each of the separately acquired businesses into a single, cohesive organization that can share resources and expertise as efficiently as possible. For Bohannon's department, that effort has led to the establishment of eight regional logistics organizations. Today, she explains, the company operates a matrix approach, with agreements with select global service providers for activities including freight forwarding, air and ocean transportation, customs clearance and export packaging, supported by local agreements for the provision of specialist services within regions.

Agreements with global providers such as DHL clearly help to create consistency and simplicity in the procurement of logistics services, but Bohannon notes that it is the strong relationships it builds with its providers that are the key to logistics performance. "The category manager for our global freight forwarders is not only responsible for negotiating good contracts," she says. "They also manage the ongoing relationship." The aim of this approach is the development of "true partnerships" with its chosen suppliers. "We want our suppliers to be innovative, and to always be looking for opportunities to consolidate activities and improve efficiency," says Bohannon. "We want them to come to us with ideas."

The value of these kinds of partnerships has been underlined by the recent turbulence in the energy sector, as the falling oil price unleashed a wave of cost cutting across the industry. "We've always been a 'just in time' business," says Bohannon. "One way you win in this industry is by showing that you can get on-site ahead of your competitors. But when you are shifting heavy tools around the world, that isn't easy." Traditionally, the emphasis on speed meant a lot of reliance on airfreight, she explains; but Weatherford has shifted the majority of its freight to the ocean. "Now when we ask our logistics providers for a quote, we expect them to offer alternatives, so we have the opportunity to select a lower cost option if we can."

5000

The number of patents in Weatherford's portfolio



WELL EQUIPPED:

An Oman oil field where the Weatherford Maximizer® pumping units provide the needed long-stroke rod-pump systems.



tinyurl.com/del-weatherford

Flexible processes

Remaining responsive while keeping costs under control requires Weatherford to continually look for ways to get smarter about the way it manages its supply chains. “We are constantly working with our manufacturing and procurement functions, and with the guys working at country level to improve forecasting,” says Bohannon. “Increasingly, we try to be proactive about understanding the likely future equipment needs of a territory and staging the right equipment in or near the region so we are ready to respond quickly when it is needed.”

Even with the best possible forecasts, Weatherford’s logistics processes need flexibility and responsiveness, too. Unexpected events are a fact of life in the oil and gas industry. “Many of the places we work are subject to geopolitical challenges,” notes Bohannon. “And that can mean that we sometimes have to dismantle projects and get our

people and equipment out of a region very rapidly.”

Going into new regions also comes with its own challenges, requiring logistics personnel to open new transport links and quickly understand the legal and customs frameworks wherever they are required to operate. It is vitally important that Weatherford ensure that everything it does complies with local and international laws. While doing that requires lots of expertise on the ground, Weatherford’s logistics is “the final gatekeeper”, ensuring that operations can be set up and run “quickly, smoothly, but in full compliance with the law.”

Even in politically stable regions, the industry is always creating new logistics challenges. Perhaps the most notable of recent years has been the rapid growth of unconventional oil and gas production in the US. “The fracking market has developed very rapidly,” says Bohannon. “That meant new infrastructure had to be developed such as roads and places for a people to stay, and we had to find ways to manage the movement of different materials such as sand and water, that these approaches need.”

For Bohannon, however, the constant emergence of new challenges is exactly what is most fulfilling about her role. “I’ve worked in many parts of this industry, from freight forwarding to EPC (Engineering, Procurement Construction), and I can draw on experience associated with the different sides of the business when looking for new solutions.” It is fascinating, she says, to have a strategic perspective on logistics challenges, “to create possibilities that haven’t been considered before, and to be able to effect change. When we come up with new ideas on the logistics side, the company is ready to listen and ready to take them on.” ■ *Jonathan Ward*

TOOLED UP:

Weatherford helps oil companies drill, construct and operate oil wells in the most demanding corners of the globe.



OFFSHORE EFFICIENCIES

With logistics accounting for a third of the direct operating costs of offshore oil and gas facilities, and instrumental in much more, getting them right has become a critical priority.

As any oil and gas company draws up its plans for the development of a new facility, the logistics infrastructure, organization and operating strategy to support that facility are a high priority. That's because offshore logistics are expensive, difficult and vitally important.

Offshore logistics need to be a genuine just-in-time operation. Platforms have extremely limited space to store materials and accommodate personnel, so there is a strong incentive to ensure that the equipment and people needed for a job are delivered as near as possible to its scheduled start time. But they can't afford to be late either. With the operating costs of a typical platform running at \$300,000 to \$500,000 per day, even an hour's delay can cost \$10,000 or more, and that's before accounting for the cost of lost production, or the cost of renting expensive equipment or contract personnel for longer than planned.

For planners, the challenge of meeting tight and closely coordinated delivery windows is compounded by the unpredictable nature of the offshore environment. While the reliability of oil production equipment is actually very high, geological conditions are much less so, meaning that drilling operations can proceed significantly faster or slower than expected, and some events such as the need to replace a worn or damaged drill bit can create delays of 12 hours or more. Then there's the weather. High winds and large waves prevent helicopter operations and delay vessels, leaving operators scrambling to catch up when conditions improve.

Effective and efficient

Finally, there are safety considerations. Offshore operators take safety extremely seriously, and logistics processes are an intrinsic part of their safety approach. All equipment needs to be designed, maintained and run to the highest possible safety standards, and logistics assets also have a central role to play in emergency protocols such as the evacuation of personnel, for example.

Operating effective and efficient logistics processes in this environment requires careful contingency planning and the right amount of redundancy in assets and personnel. It may be determined that a single helicopter is sufficient to manage regular personnel movements to and from the platform, for example, but a second will usually be required to meet peaks in demand, to maintain service

12

The hours that can be lost by a damaged drill bit.

when the primary aircraft is undergoing maintenance and for emergency situations. To control costs while keeping such contingencies in place, operators increasingly look for opportunities to share assets between multiple facilities in the same region.

It also requires considerable skill in execution. Logistics staff must be able to coordinate ship, helicopter and personnel movements with multiple stakeholders and multiple project planning systems to ensure the right people, tools and materials arrive at just the right time. They need flexibility too in order to react to changes in weather or operational issues and to ensure that transportation is fully utilized to minimize cost. It's no wonder that an increasing number of operators are looking to third-party expertise to support them here.

Beyond the day-to-day challenges of logistics operations, companies also need to manage longer-term variations. The intensity of logistics support required for a facility varies during its overall life cycle, and one platform may run multiple wells each at a different stage in its own life cycle. Some equipment may even operate in entirely different locations at different times – and such changes have a significant impact on logistics planning, since longer distances don't just increase flight times, they also reduce helicopter capacity as people and equipment are replaced by extra fuel. With some assets being used on an increasingly global basis, it isn't just the final link in the logistics chain that needs to be reconfigured to maintain support. Operators must also modify the location of their onshore operating facilities – perhaps to an entirely different continent. Here, the use of third-party owned and operated assets such as onshore warehouse facilities can help operators to manage their requirements as they change over time. ■ *Jack Meijerink*



JACK MEIJERINK

Jack Meijerink is a consultant with over 30 years of experience in the management of logistics for offshore oil and gas facilities around the world.

INNOVATION ON TRACK

New rail innovations are now running on tracks – and waiting on drawing boards.

Across the world, many rail networks are experiencing both increasing demand from passengers and high volumes of freight. What's more, according to a report by the OECD's International Transport Forum, those numbers are going to rise further still in the decades to come. Rail passenger mobility numbers are forecast to soar by a staggering 200% to 300% by 2050, while freight transportation is estimated to rise by as much as 150% to 250% in the same time frame.

In terms of logistics, rail continues to have advantages over road for the movement of heavy bulk items such as coal and aggregates, and for high-value products such as cars, allowing coordination of just-in-time production from multiple sites. Yet with freight numbers increasing, capacity issues have to be addressed; although, experts warn this is a complex problem with no simple rules or solutions.

"There is a huge challenge for the rail industry in the allocation of track capacity, since passenger trains tend to run to the same timetable for long periods of time, whereas much freight traffic is dependent on customer requirements and may be seasonal," notes Dr. Allan Woodburn, course leader, MSc Logistics and Supply Chain Management at the University of Westminster in London. "There may be an opportunity – assisted by technology – to develop more flexible and responsive ways to this issue that would lead to more and better train

modes that lead to inefficiencies and wasted capacity."

Due to the challenges coming down the track, the rail industry plainly needs to be ready to adapt and change and speed into the future with striking new technological innovations. Some of these are currently waiting on drawing boards and seem so pioneering as to be positively space-age, such as Tubular Rails, a US-based idea which features "trackless train technology" in which the rails become part of the train, allowing it to travel at high speeds through magnetic hoops elevated on pillars. Innovations making a difference now, however, include everything from solar-powered dispensers pumping friction modifiers on the track to reduce wheel wear and prevent slippage (which wastes energy), to Bombardier's "Last Mile" locomotive, which is electric, but has a support diesel engine and battery. This removes the need to change locomotives in shunting areas of a rail network (known as "the last mile") which are generally not electrified: container terminals, harbors or side tracks to factories.

Advanced software technologies have also been revolutionary. In the US, for instance, Norfolk Southern Railway uses software that integrates railroad logistics with traffic control systems, estimates expected track usage based on train schedules, then creates a plan to ensure trains move faster and more efficiently, potentially increasing average train speed by 2 to 4 mph. That may not sound like much, but the company says that even a one-mile-per-hour increase in train speed can potentially save around \$200 million annually in capital and expenses.

For Paul Priestman, one of the world's foremost train designers and codirector of London-based agency Priest-



tinyurl.com/del-priestman

paths without a need for massive additional capacity, although this also depends on the requirements of the growing passenger activity." Dr Woodburn believes that the capacity issue must be considered in as holistic a manner as possible – and, ideally, the characteristics of end-to-end journeys should also be taken into account "since it is often the interfaces between rail and other



manGoode, getting from A to B as quickly as possible is high on his freight rail agenda. Priestman is creating the design vision for the next generation of London Underground trains, but he is also busy maximizing the efficiency of rail freight systems for a client. “When we talk about future train innovation, freight needs to be part of the discussion, too,” he says. “With rail freight in particular, you have to remember that speed is of the essence. It’s why we are seeing some interesting new systems that allow containers to be lifted directly off of trucks and loaded straight onto trains – or driven onto trains.”

That need for speed has also fueled a UK government decision to green light the development of an underground rail network for freight and parcel transportation in a country where road congestion costs its economy £31.9 billion a year. The network is being developed by a company called Mole Solutions whose aim is to run a driverless capsule (called The Mole) through its tunnels. This will be propelled on electromagnetic waves that, say its creators, can be adapted to carry any type of freight to shops, businesses and factories. The idea is still in trial phase in Cambridgeshire; although, if successful, it could be rolled out to other towns and cities across the UK.

Driverless trains

Even though The Mole is still a test case, it’s a good illustration of the way that rail designers are having to think outside the box in order to keep innovations relevant to the needs of tomorrow. Some of these were highlighted in a 2014 report by professional services firm Arup, called Future of Rail 2050, which revealed where the industry

\$200 MILLION

The amount Norfolk Southern Railway could save annually thanks to a one-mile-per-hour increase in train speed.



tinyurl.com/del-future-of-rails

might be heading over the next three decades. Arup forecast that robots could have a more significant role in inspecting infrastructure such as tunnels and bridges, and that advances in nanotechnology would make train materials and infrastructure “lighter, stronger, smarter and greener.” Big data, meanwhile, could increase operating efficiency by helping pinpoint faults on a rail network, narrowing the problem down to a particular stretch of line.

Driverless freight technology is in action already: in Australia, for instance, an automated, long-distance, heavy-haul rail network from mining company Rio Tinto delivers its iron ore to ports. Called AutoHaul, it shortens journey times – no crew changes are needed – and so reduces both energy consumption and CO₂ emissions.

In the near future, Paul Priestman believes that we’ll continue to see high-speed rail networks bloom across the globe. However, high-speed does present certain challenges for freight, he admits. “From a mechanical point of view, high-speed freight is heavy, so the rail infrastructure it moves on has to be different. Yet in the future, to keep freight running efficiently, we need passenger and freight to travel at the same speed on the same track. We need to employ joined up thinking.”

Getting innovative designs off the drawing board and into the real world requires a mix of political will and viable economics, insists Priestman. But he remains optimistic for the future of rail. “When people realize that they will be able to export and import goods in a new way and in increasing volumes, they see the numbers start to stack up,” he says. “That’s when rail innovations become a reality.” ■ *Tony Greenway*



THE BEST OF THE BRICS?

India is surging ahead with a fast-growing economy that may overtake China's this year. So why is it suddenly such a great place to do good business?



BUSINESS SENSE:

Prime Minister Narendra Modi has implemented a number of reforms to stimulate growth.

INDIA

Population: 1.28 billion

GDP (April 2015): \$2.308 trillion

World Economic Forum's Global Competitiveness Index:

71st place (out of 144 countries)

World Bank's Ease of Doing Business ranking:

142nd (out of 189 countries)

GDP growth 2015–2016: 7.9%

(Citigroup forecast as of June 2015)

DHL Global Connectedness Index:

71st place (out of 140 countries)

It's 15 years since the BRICs concept highlighted the new world order among emerging markets. But while Brazil, Russia, and now China, have slid backwards, India has come to the fore.

In the complex and intertwined worlds of geopolitics and economics, no one would suggest a single influence is driving India forward. Yet the emergence of business-oriented Prime Minister Narendra Modi – who won a landslide general election in May 2014 – is thought to be an important factor in the country's recent remarkable growth.

Before Modi's success at the polls, it had been 30 years since a single party had won an Indian general election; and so, for three decades, coalition governments ruled the country, the last of which ended its decade in office mired in legislative stagnation.

Modi's win, however, has shaken Indian politics to its foundations. His Hindu nationalist Bharatiya Janata Party (BJP) won the 2014 election with such a convincing majority that he has no need to placate coalition partners. Both conservative and pro-enterprise, the BJP is free to drive an agenda that appeals equally to India's business community and those overseas corporates eager to increase their stake in such a fast-growing economy.

Then there is Modi himself. He has impressed as a charismatic and fiercely hard-working individual, whose speeches underline his determination to increase foreign direct investment (FDI) and highlight his commitment to drive out the corruption which has dogged India's bloated public sector for decades. Modi is also clearly determined to make manufacturing a key economic driver, especially through his 'Make in India' initiative, which looks to stimulate investment and innovation in order to tackle the country's huge skills deficit and create jobs and wealth throughout the economy.

The program has already scored notable high-profile successes. For example, Bangalore-based Dynamatic Technologies has now produced its first set of parts for Boeing's Chinok helicopter from a plant set up in India last year;



Photos: Jose Giribas/SZ Photo, Hannover Messe/dpa/picture alliance

while Airbus has announced that it is awarding its aero-components production contract to Mahindra Group, owner of India's biggest sport utility vehicle maker. Then, in May, as if to provide an extra boost, figures showed a 56 percent jump in FDI in the five months since Make in India was launched.

With May's manufacturing output at a 2015 high – and with manufacturing GDP having grown 7.1% in 2014/2015 – it appeared Modi's policies were taking swift effect. As his first year in office ended, India was squarely on course to overtake China as the world's fastest-growing major economy, with the latter suffering a double whammy of falling domestic demand and lower exports. In 2014 to 2015, Chinese gross domestic product (GDP) grew 7.5%, compared to India's 7.3%; yet in May of this year, it was announced that India's GDP had grown 7.5% during the January to March period, faster than China's 7% – and partly because of improvement in the manufacturing sectors.

June brought further good news for Modi, as the Reserve Bank of India cut its “repo rate” – the rate at which its central bank lends funds to commercial banks – for the third time in 2015. The closely-watched HSBC Markit Manufacturing Purchasing Managers' Index – which tracks orders, output, employment and prices – also rose, emphasizing that sector's buoyancy and the impact of increased FDI.

Policy initiatives

However, although India's headline GDP data continues to impress, Anuj Chande, head of Grant Thornton's South Asia Group, counsels that expectations shouldn't be allowed to run unchecked. “There's no doubt Modi has made sensible decisions in terms of policy initiatives, and his messages have been well received by business,” he says. “But in terms of on-the-ground reality, the impact will take time to be seen.”

\$3.5
BILLION

The amount of revenue generated by Delhi-based online marketplace Snapdeal in just one month (May 2015)

TECHNICAL KNOW-HOW:

Factory workers at Festo, the global automation technology supplier in Bangalore



A crucial element will be the introduction of the Goods and Services Tax (GST), which has been called “the single most important tax reform initiative in India since independence. (see box: India’s GST Bill). Currently, each of India’s 29 states imposes an archaic structure of indirect taxes and tariffs on goods and services crossing its borders – at huge cost to business. GST, however, would abolish these charges, simplify the tax structure and create a single, unified market – yet it has long been delayed, with the result that target dates of its implementation in 2010 and then 2013 have been missed. That’s unfortunate, admits Chande. “The present system is a complex and confusing burden on business,” he says “and to harmonize and simplify the structure would have been a real bottom-line benefit.”

Nevertheless, the lower house (Lok Sabha) of the Indian parliament did pass a GST amendment Bill in May of this year, and Modi’s finance minister, Arun Jaitley, is bullish that the legislation will come into force in April 2016. However, as the opposition Indian National Congress (INC) party and its allies dominate the upper house of the Indian parliament (Rajya Sabha), Chande thinks there’s still a lot of work ahead before the Bill is made into law.

16

PERCENT

The proportion of GDP generated by India’s manufacturing sector



tinyurl.com/del-makeindia

MAKE IN INDIA

PM Modi launched his ‘Make in India’ initiative in September 2014 – with the symbolic logo of a lion constructed from cogs – aiming to take on China’s mantle as a global manufacturing powerhouse. He has since asked the world’s leading industrial nations, including China, Germany, the United States and the UK, to come to India, with key reform pledges to attract overseas manufacturers, including less regulation, massive infrastructure investment and simplified corporate tax structures. Modi’s aim is to transform the domestic economy, create value-added jobs and increase employment and wealth levels, but also to turn India’s manufacturing sector into a global exporting hub. Critics believe a ‘Make for India’ strategy would work better with a focus on manufacturing products designed and made for Indian consumers.



ONLINE ORDERS: e-commerce is now attracting customers from outside India’s core urban areas.

“For me, 2016 is optimistic,” he says. “Yes, there’s been a lot of good news and Make in India is already generating significant FDI, especially in electronics, pharmaceuticals and automotive. There’s also been a tremendous focus on making sure corruption is no longer a barrier to business growth, and putting more government licenses online will certainly underpin that strategy and streamline those processes. My concern is that the government is still very much a one-man band. It needs more experience and particularly more technocrats if the policies are going to be delivered. Although, saying that, this is the most optimistic period for India that I can recall in the last 25 years.”

Skills and investment

India’s e-commerce sector is another hugely buoyant sector with massive potential. “There are around 250 million smartphone users, who are typically young, upwardly mobile and comfortable going online to carry out transactions; although, because only a third of Indians have bank accounts, many still want to pay cash on delivery which presents obvious challenges,” says Grant Thornton’s Chande.

Online commerce is now attracting swathes of customers from Tier Two and Tier Three cities – outside India’s core urban areas – and recent varying estimates value the Indian e-commerce market anywhere between \$50 billion to \$130 billion by 2020. India’s e-commerce business model thrives on discounts, relative to prices being asked by traditional ‘bricks and mortar’ players; and even though the revenue numbers are huge, online purchases are still only around 1% of the market, so the potential remains massive.

However, much of the traffic is being driven by one-time sales. In October 2014, India’s largest e-commerce player, Flipkart, notched \$100 m in revenues in just 10 hours, after its Big Billion Day, and such huge spikes in demand pose significant challenges to the logistics sector. Many of India’s e-commerce customers are placing multiple orders for the same product, paying for the first to arrive and then sending the rest back, making returns a major challenge for even the largest logistics provider.

“We’re making between 150,000 and 160,000 deliveries per day, so we’re refining our delivery options to give customers more choice,” says Malcolm Monteiro, CEO for DHL’s eCommerce operations in Asia and the Pacific. “The e-commerce firms are looking to win loyalty and build their brand through discounts; but in logistics you must constantly focus on improving the customer experience across all touchpoints.”

New competition

Analysts have so far concentrated on India’s pure e-commerce players, with Snapdeal chasing the market leader Flipkart, which – like Amazon – began as an online bookseller. Both are attracting investors on a global scale,



SCIENCE APPLIANCE:

A technician checks mobile phones at the Chinese Celkon manufacturing plant in Hyderabad.

and their backers accept they won't get a return for 15 or even 20 years, because they're making a long-term bet on the Indian market. But now there is the prospect of new competition.

"As the market begins to mature, I wouldn't be surprised if we saw some of the bricks and mortar retailers, which have been sitting on the sidelines, decide to come in with a real bang," suggests Monteiro. "As the e-tailers eventually start to reduce their discounts, they'll have to offer more value-added services to retain their customers – perhaps through flexible delivery options or cash on delivery payment – so it will be very interesting to see which company gets the balance right between margins and volume."

"Prime Minister Modi has made sensible decisions in terms of policy initiatives, and his messages have been well received by business."

Anuj Chande, head of Grant Thornton's South Asia Group

Vikas Anand, CEO, DHL Supply Chain in India, shares the view of Grant Thornton's Chande that delivering the GST bill into law by 2016 will be a challenge, and considers 2017 more likely. As overseas manufacturers look to learn more about Make in India and assess the scope for FDI projects, he also stresses that it would be a mistake to treat India as a single entity.

"If you are new to India, you should think of it like the European Union," he says. "There are 29 states, many of them as big as single countries elsewhere, and until GST is achieved, each will have its own system of tariffs, duties and taxes, which is a major challenge for anyone in a supply chain. We've seen the domestic market driven by demand for fast-moving consumer goods (FMCG), which typically end up in small warehouses in each state. At the moment, most Indian supply chains are still fragmented, but change is coming, especially from the retail (including online) sector; and I'd expect to see more larger warehouses, and the consolidation of inventories, as manufacturers look to drive greater efficiencies into their operations."

Its potential may not have been fully realized yet; and there is plainly more to do in terms of financial reform and physical infrastructure. But, increasingly, India is shaking off the shackles of its economic and political past and facing the future with renewed confidence and optimism. And that can only be great news for companies who want to do business there. ■ Ian Halstead

For more on e-commerce from DHL, please visit

 www.delivered.dhl.com/e-commerce-india

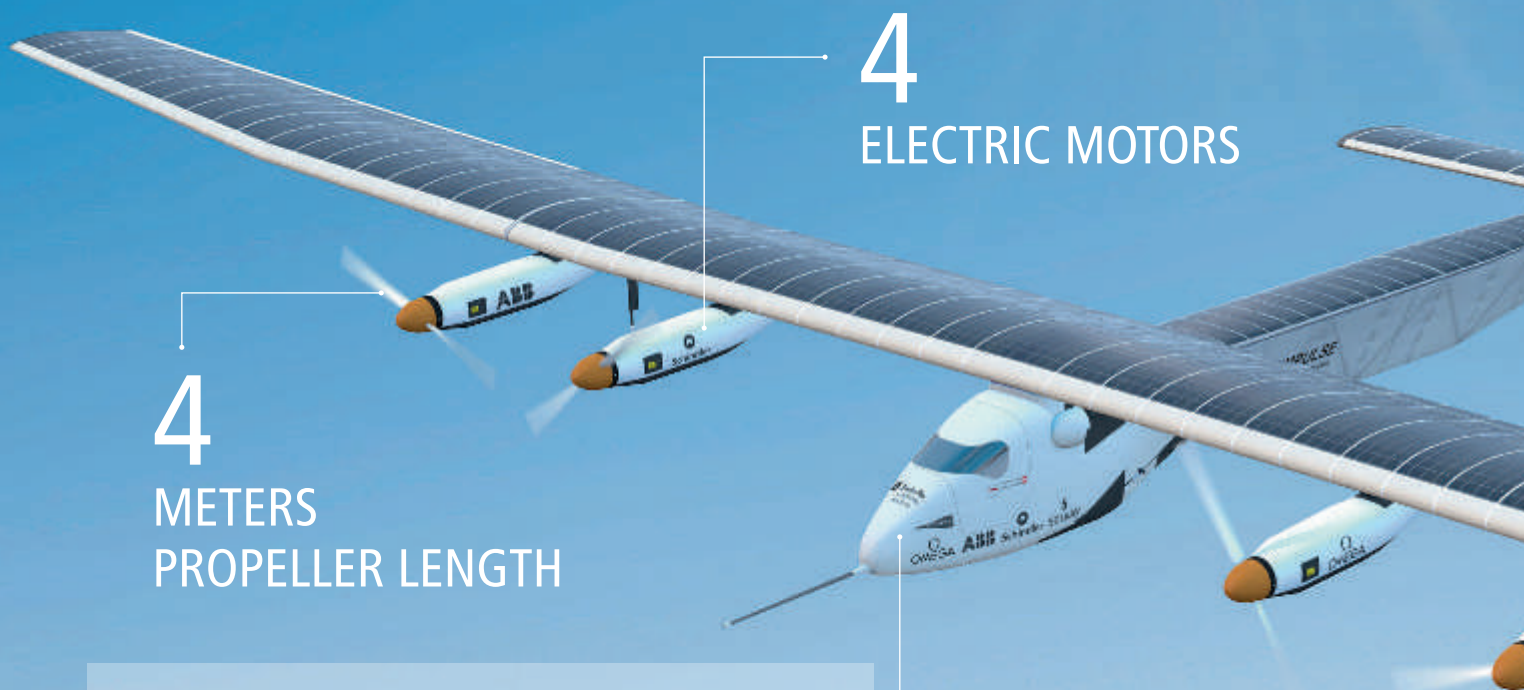
INDIA'S GST BILL

For decades, India's federal structure has allowed individual states to impose their own tariffs, indirect taxes and levies on all goods and services crossing their borders, creating inefficient and costly burdens for business. The Goods and Services Tax (GST) bill aims to remove them all and impose a single and transparent national tax structure. Finance Minister Arun Jaitley has described the legislation as the "biggest tax reform" since modern India was created in 1947.

SOLUTIONS

FLYING SOLAR AROUND THE WORLD

The first around-the-world solar-powered flight could have implications for passenger travel – and logistics.



On March 9, pilot André Borschberg boarded the plane Solar Impulse 2 and took off on the first leg of a five-month record-breaking mission to fly around the world – but without using a drop of fuel. This is because, as its name suggests, Solar Impulse 2 is a solar-powered airplane, and one that is capable of flying day and night.

Borschberg is taking it in turns with his copilot and cocreator of Solar Impulse 2, Bertrand Piccard, to fly this extraordinary looking single-seater aircraft from the Middle East and back again. At the time of writing, Borschberg had already completed the longest solo flight achieved in aviation (117 hours); although, in July, when attempting to cross the Pacific via Hawaii, it was discovered that the plane had suffered battery damage due to overheating. Yet if Swiss-born Borschberg and Bertrand are ultimately successful in their quest, their names will go down in history as pioneers.

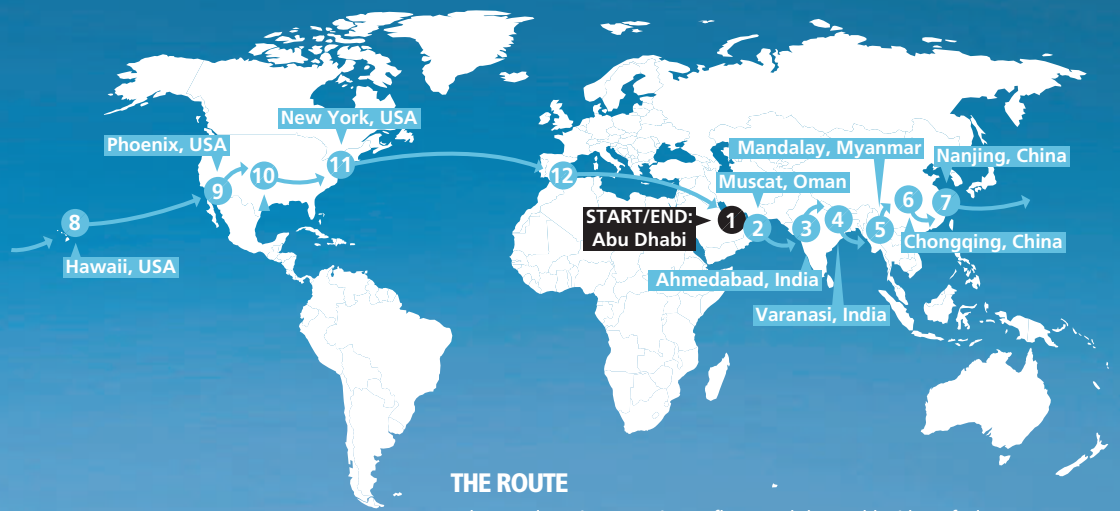
But that's not their goal. Both men hope that their journey will show that “clean technologies and renewable energies can achieve the impossible.” And that, of course, could have hugely positive implications in the future for solar-powered passenger air travel – and air freight.

Are we at the beginning of a new chapter for air travel?

8,500
METERS ALTITUDE



tinyurl.com/del-solar-airplane



THE ROUTE

Solar Impulse 2 is attempting to fly around the world with no fuel, taking off from Abu Dhabi, over to India, China and Japan, and across the Pacific to Hawaii. From Hawaii, the journey continues to mainland America, over the Midwest and on to New York. Finally, Solar Impulse 2 will fly from New York to Europe and back to Abu Dhabi, where the adventure began.

17,248
SOLAR CELLS
ACROSS A 270 m²
SURFACE AREA

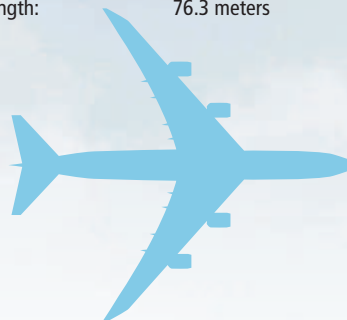
SOLAR IMPULSE 2

Weight:	2.3 tonnes
Average Speed:	70 km/h
Wingspan:	72 meters
Length:	22.4 meters



BOEING 747-8

Weight (empty):	213 tonnes
Maximum Speed:	900 km/h
Wingspan:	68.5 meters
Length:	76.3 meters



EXECUTIVE VIEW

JOINING THE DOTS

Logistics guru Dr. John Gattorna explains why he has made the study of supply chains his life's work – and reveals his latest thinking on the subject.

Dr. John Gattorna, one of the world's foremost supply chain experts and thought leaders, is passionate about his work. In fact, he admits, he borders on the obsessive. "My wife thinks that I spend too much time thinking about supply chains," he says. "But they pervade all our lives and everyone is affected by them. And that's what I find so fascinating."

Sydney-based Gattorna started his "journey of discovery through the maze of logistics and supply chain networks" in 1975 and, during his career, has worked as a consultant/advisor, helping major blue chip corporations around the world optimize their supply chains. Now the executive chairman of a specialist advisory business, Gattorna Alignment Pty Ltd, he is also the author of a number of groundbreaking books on the subject. His latest, *Dynamic Supply Chains: how to design, build and manage people-centric value networks*, was published in May and explains how his thinking around supply chains has evolved through to 2015.

Gattorna stresses that 'one size fits all' supply chains are unworkable, and that aligning supply chains with customers, suppliers and third-party logistics providers is the way forward. But to engineer an aligned supply chain the trick is to understand patterns in

the marketplace and, he says, "join the dots" – which isn't something that many, if any, people have tried to do before in book form. John Gattorna excepted, of course.

"If you want to sum up the things I've done in my life," he says, "you could say that I have joined a lot of dots."

Your first seminal book was called *Living Supply Chains*. What did you mean by 'living'?

Years ago, people only thought about a very small part of the supply chain. It was called 'finished goods distribution' back then. Now when we talk about supply chains we start from the raw materials and go all the way through to the end user and beyond, actually. So what I was saying – and what I'm still saying – is that effectively supply chains are like the body's central nervous system; but what flows through their veins are finances, information, and product. I realized early on that supply chains aren't driven by technology and they aren't driven by infrastructure. Those things are just enablers. What they're driven by is people making decisions: customers at one end, suppliers at the other and enterprises in the middle. Not many people understood the word 'living', though, so we came up with another word for my next book: dynamic.

Why do you believe the 'one-size fits all' supply chain is 'seriously flawed'?

One of the big problems is that a business can't cost-effectively service the whole market with a single supply chain configuration. The more it tries to capture a marketplace with that approach, the more exceptions will arise – and that drives cost up. In fact the more you try to standardize things, the worse it gets. And paradoxically you end up with a higher cost than if you'd stayed in bed and done nothing. You have to align with your marketplace. That means you first of all have to understand what your marketplace is telling you; and then you link your marketplace with your marketing strategies, your product, your supply chains and your corresponding logistics.

 tinyurl.com/del-gattorna

WIN A COPY OF JOHN GATTORNA'S LATEST BOOK

We have 10 copies of John Gattorna's new book – *Dynamic Supply Chains: how to design, build and manage people-centric value networks* – to give away to *Delivered.* readers. For a chance to win, simply e-mail delivered.magazine@dhl.com by October 30 with "John Gattorna Competition" in the subject field, and include your full name and address. All names will be entered into a prize draw, and the 10 winners will be notified by e-mail and sent a copy of the book. For terms and conditions, please see:

 tinyurl.com/del-gattorna-competition

You've talked about the importance of understanding buying behaviors. How many are there?

There's a relatively small number. There are 'loyal' or 'collaborative' customers who trust the brand and don't care if they pay a premium for it; 'transactionals' who are constantly looking around for the lowest price; and 'opportunistic' customers who are unpredictable and demanding, but driven by immediate satisfaction and want things now. Then there is 'transitory' buying behavior, as market situations force a change in buying behavior, at least temporarily. That's the dynamic bit we have to cope with.

As a business you can look at your market – whatever it is you are selling – and you identify what the structure is: what percentage of your customers are loyal, what percentage are transactional, etc. Using this method you can then reverse-engineer your processes, and precisely build your supply chains. Whereas, in the past, it's just been one great big guess.

In your experience, what keeps supply chain managers awake at night?

The fear of unplanned disruptions, whether they are caused by an internal computer failure or external factors such as natural disasters. More and more senior managers

ABOUT DR. JOHN GATTORNA

After a spell as a civil engineer, Dr. Gattorna switched to the field of supply chain research, completing his PhD at the Cranfield School of Management in the UK. A former managing partner of the Accenture Supply Chain Practice – ANZ and Southern Asia, Gattorna is the author of major books including 'Living Supply Chains: how to mobilize the enterprise around delivering what your customers want' and 'Dynamic Supply Chain Alignment'. He is also a frequent speaker on the international conference circuit.

look to the area of logistics and supply chain as a way to cut costs; but the more costs you cut the more you lessen your ability to recover from a major disaster – the kind that puts companies out of business.

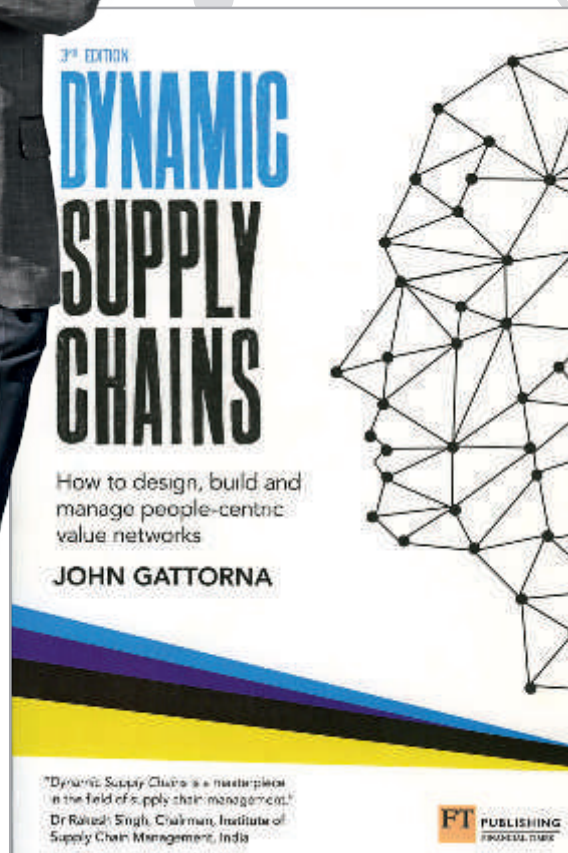
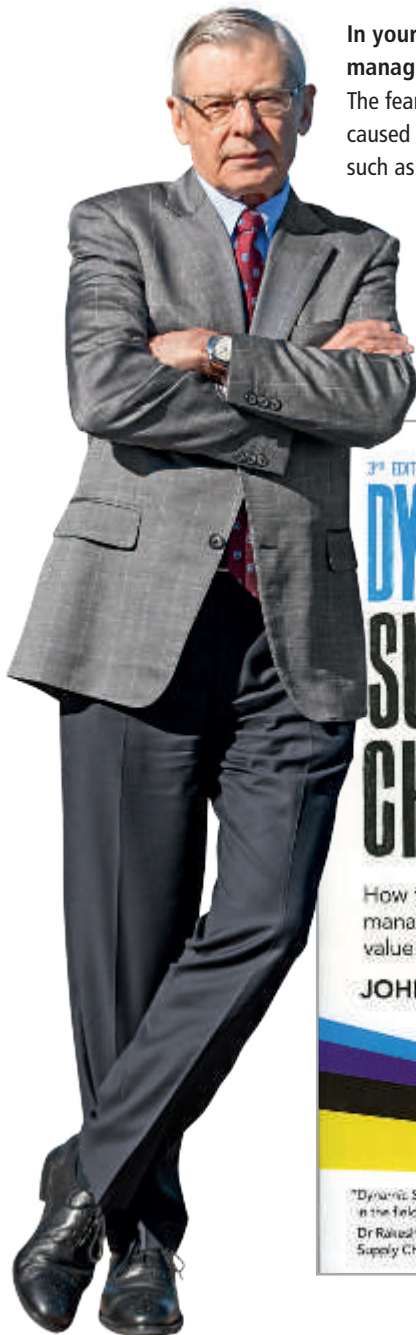
A famous example I mention in my book is the major fire in the year 2000 at the Philips New Mexico plant that was making chips for both Nokia and Ericsson. Nokia was clever and found out about it early; but by the time Ericsson was clued in, all the remaining stocks had been soaked up by Nokia. Risk management is the single biggest worry.

What effect has e-commerce had on supply chains – and how will it continue to effect them in the future?

Where do we start? It's had a huge effect. If we go back to the dot com boom of 2000, the front end of e-commerce was pretty easy. But there were two main problems that caused a lot of companies to subsequently fall over. One was that the fulfillment end wasn't ready and just couldn't cope cost effectively. The other was that when consumers place an order online they expect to get it tomorrow and pay nothing for delivery. Companies are a lot better prepared now. They have worked out their fulfillment end processes so they no longer fall behind the front end order processing and order entry. I'd say the overall benefit of e-commerce is that the whole supply chain has sped up.

Do you ever switch off?

To relax, I play golf. But if I'm having a lesson with my golf pro, he might say something like: "It's the left hand that drives the company, John!" What he means by that is if you're a right-hander playing golf, it's not your right hand that's in command and control, it's your left. That will strike a chord with me and I'll think: "I can use that idea and apply it to my work!" So I filter stuff in and out of my mental framework all the time. ■ Tony Greenway



THE ALMOST BIONIC MAN

Warehouse workers pick and pack using augmented reality, while vital signs are collected from a wristband, rather than in a doctor's office. Wearable devices are here to stay and are changing the way we work, rest and play.

It's Jonathan Henderson's first day in his new job at the warehouse of a large electronics corporation. He sets off from home early, accessing a map and navigating the unfamiliar route on his smart glasses.

On the train he watches a 'welcome video' streamed to his glasses by the HR department. Later, when working in the warehouse, his armband automatically tracks the goods that he needs to move along the aisles of shelves, while the sensors in his ID badge analyze the motion and time that are involved in completing a particular task.

Gone are the days when Jonathan would have had to sit at his computer to travel down the information superhighway. The advent of tablets and smartphones has allowed us to carry the Internet in our pocket or bag. We could be anywhere and still be able to log on and start surfing.

Now another change is beginning to make big technological waves: the growth of wearable tech.

Google Glass and, more recently, the Apple Watch have probably been the most high-profile wearable devices in terms of media coverage. Yet the market is much bigger than that: virtual headsets that stream 3D entertainment direct to your eyeballs, jewelry that counts your steps and smart clothing that has built-in LEDs for extra visibility or monitors the calories its wearer has burned. Even fashion designers are getting in on the game. Ralph Lauren has developed a wearable tech version of its classic polo shirt, which will be available this year and can track and stream real-time biometric data directly to a smartphone or tablet. And big name brands such as Adidas, Fujitsu, Nike and Philips are behind the newest developments in fitness trackers, including headbands, posture monitors and 3D trackers.

**\$70
BILLION**

The estimated market value of wearable technology by 2025

**78
MILLION**

The number of people expected to wear mobile health technology by 2020

In fact, wearables represents the fastest-growing sector in global computing, with market values set to rise from \$20 billion in 2015 to almost \$70 billion in 2025. Yet while smartwatches regularly top the 'most wearable tech' lists, it's wearable mobile health technology in the form of medical and fitness trackers that currently dominates the sector. Some health professionals believe that good medical information from patients collected on wearable tech – on calorie intake and heart rate, for instance – would better inform their conversations and help them deliver a higher quality of care. Mobile health technology was worn by 14.3 million people worldwide in 2014, with this figure predicted to rise to 78 million over the next five years as new trends for equipment featuring body sensors become more popular.

Body sensors are already fitted into sleep trackers by companies such as iHealth and can tell you whether you are sleeping 'efficiently'; and they can be found in a potentially life-saving device from Medtronic which has produced a wearable 'artificial pancreas' that monitors blood glucose levels non-invasively and can even inject insulin to a specified level. The potential for sensors is clearly huge. Market research company IDTechEx estimates there will be over three billion sensors in wearable technology devices by 2025, with the market for wearable sensors reaching \$5.5 billion by 2025.

Broader interest

Once these could be dismissed as niche products or even a fad; but is wearable tech now positioning itself to become an important part of our future? "Wearable products today are definitely at a stage where they are interesting for a broader group of consumers," says Christian Stammel, CEO of Wearable Technologies AG. "Acceptance of these products has grown tremendously in the past year alone and wearable technology will soon connect all electronics into one fluid movement of human, environment, and technology."

Forward-thinking

"For impact to market you couldn't get bigger than Google Glass," says James Hayward, Technology Analyst at London-based IDTechEx. "While it succeeded in attracting a lot of media attention, Glass faced criticism for being underdeveloped." A new, more stylish version is coming soon in collaboration with an Italian eyewear designer.

The virtual world is advancing too, with the advent of Google's complete virtual reality platform made out of – really – cardboard. Hayward believes that many thought Google Cardboard was a tongue in cheek product. "They may have a point," he says. "It only costs \$30! The product works by placing your phone at an optimal distance away from the lenses fitted into the cardboard headset. Then, by using compatible apps, the lenses create a 3D effect when held up to your eyes."



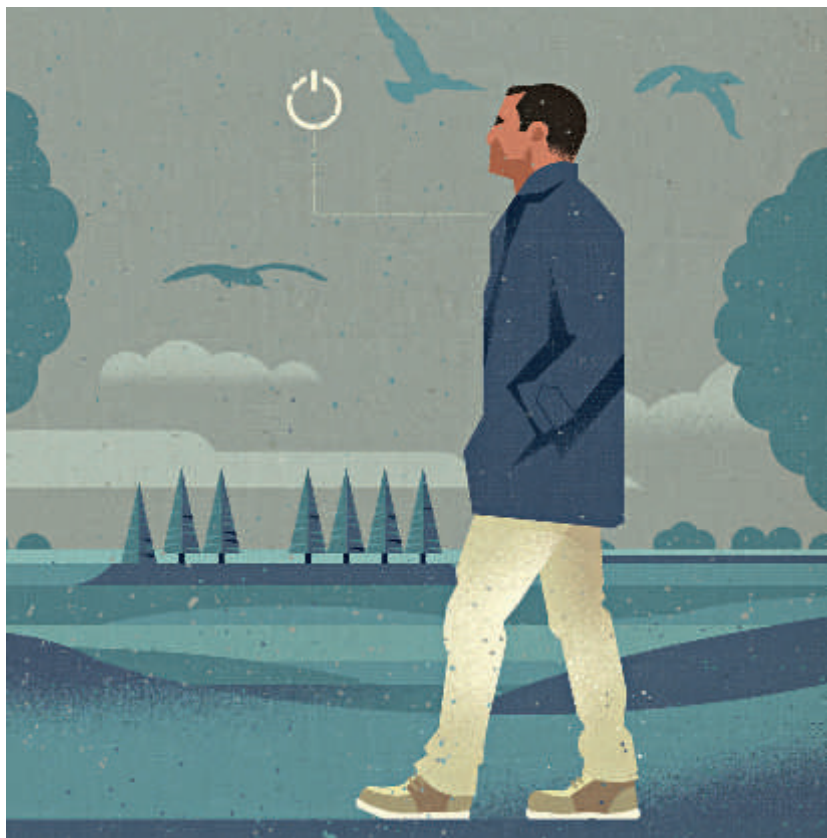
Other virtual advances include Oculus Rift, a head-mounted fully immersive 3-D augmented reality display, set for commercial release in 2016. Paired with headphones it makes games, virtual worlds and live events feel ,real'. But it's not just the gaming industry that is likely to advance. The commercial world is set to gain too. The system has already been trialled by DHL and Ricoh at a warehouse in the Netherlands where it gives visual cues to warehouse workers as to what items should be retrieved from shelves. Workers reported a

25% increase in efficiency on a sample of 20,000 orders, resulting in shorter retrieval times and fewer mistakes.

In June, the New York Business Journal asked "when will wearable tech be ,gotta-have-it tech'?" It's a good question, especially as the publication also noted that "a killer app" has yet to materialize. Well, true, we're not at the ,gotta-have-it' stage yet. Not quite. But a vast number of companies around the world are working hard behind the scenes on a huge range of products to find that app, and make that day a reality. ■ *Angela Singleton*



tinyurl.com/del-wearable-technologies



TIME FOR A DIGITAL DETOX?

Technology is meant to make our lives easier, but our constant reliance on gadgets to text, tweet, e-mail and update social networks means that we are always 'on' – which can have a downside.

The statistics are sobering. The average person checks their smartphone more than 150 times a day or every 6.5 minutes on average, and a quarter of us spend more time online than asleep, putting us at higher risk of stress, anxiety, burnout and depression.

The World Health Organization predicts that stress and depression will be the biggest causes of ill health by 2020, and that digital overload is a major contributor. Dr. David Greenfield, Director of the Center for Technology and Internet Addiction, knows all about digital overload, having recently conducted a study that revealed 9 out of 10 Americans were "overusing, abusing or misusing their devices."

But how do you know if you are overusing? Greenfield says someone may need to rein in their smartphone habit

73 PERCENT

The number of people in the UK who say they would struggle to get through a single day without their phones or computers.

if "right before they go to bed the last thing they do before they pass out is check their phone and the minute they open their eyes, they check their phone."

This is why the need for a new type of detox – a digital one – is now being taken seriously by an increasing number of individuals as well as high-profile companies. A 'digital detox' is another name for turning off your smartphone, tablet and computer for a period and going 'cold turkey'. Instead, you use the time to reduce your stress and begin to socialize in the 'real world'.

One solution to tech overload is already offered by car giant Daimler, which has introduced an 'out-of-office' auto-delete option, whereby all emails that are received when employees are on vacation are automatically deleted and must be resent on their return. Google offers another antidote to digital burnout by running courses for its staff to encourage 'mindfulness' at work or 'being in the now'. The desired effect is that employees become more energetic and focused within their working hours by switching off from technology for a period of time.

Breaking the addiction

A way to avoid the compulsive lure of technology, therefore, might be to take a purifying digital detox vacation, where participating resorts proudly promote their lack of Wi-Fi and phone signal.

Ryan Holmes, CEO of social media company HootSuite went on a two-week digital detox during a holiday to Mexico. His aim was to try to "fully disconnect from the never-ending obligations and the constant stimuli." Ironically, by switching off from all things digital for two whole weeks, Holmes actually started to appreciate it more. His detox allowed him time to reflect on the fact that technology had let him experience some of the most rewarding and eventful moments of his life. "Technology is a part of me now and it's how I interact with many of the most important people in my life," he says. "It's also made me who I am both professionally and personally."

Another successful digital detox was carried out by employees at Transport for London who underwent a mindfulness program that resulted in days off sick due to stress, anxiety and depression falling by 70% and absences for all health conditions falling by 50% in the three years following.

However you decide to get away from technology, the key word is 'choice,' says mindfulness expert Dr. Barbara Mariposa, who claims that "multitasking and information overload are literally driving us crazy."

"Choose when to use your digital devices and when not to." She suggests that next time you leave your office or home, leave your phone in your pocket or bag for half an hour. Talk to the people around you or simply watch what's going on.

"Take a few deep breaths and bring yourself into the present moment. Just be," she says. "Feel the ripples of relaxation as you choose to unplug and refresh, rather than feed the monster of constant 'doing'. You stand to gain hugely in well-being and equanimity." ■ Angela Singleton

PULLING THE LEVERS OF SUCCESS

A new white paper argues that chemical companies should take a more strategic approach to supply chain management.

The chemical industry moves over 700 million tons of materials and goods around the world every year, with chemical firms managing global value chains along a multifaceted array of logistics asset structures, transport hubs and routes.

Yet unless accidents or major incidents make them sit up and take notice, chemical companies tend to take logistics for granted. “Logistics and supply chain management are like electricity,” says An D’Haenens, Global Manager Compliance, Sustainability and Logistics Enablement, EMEA Sourcing and Logistics Leader, DuPont Coordination Center. “As long as it works, the executive board members do not pay much attention.”

However, a new DHL white paper suggests they look again. Entitled “Supply Chain in the Boardroom: 5 Levers to Boost a Chemical Company’s Bottom Line,” it encourages board members to adopt a holistic approach throughout the supply chain to improve cost transparency and identify opportunities for value creation, enhanced customer service, and brand differentiation. It also urges the board to think beyond just the “cost factor.” Squeezed margins on transactional costs provide little wriggle room, and “simply minimizing costs (at all costs) can end up damaging the overall value of supply chain.” Logistics, it insists, should be “a strategic, value-add element.”

Based on case-study analyses, desk research and interviews with chemical industry representatives, the white paper offers five “levers” that can be pulled to help manage complexity and ensure that logistics contributes positively to the bottom line. For each lever, the white paper offers specific recommendations and guidelines for action:

Lever 1: Greater logistics value through cost optimization

Cutting transportation outlays could tip the scale toward higher storage and order processing costs. Executives need a “total cost of ownership (TCO)” analysis of all logistics activities, and companies need the right organizational structures. Logistics need to be integrated into higher-level decision making.

Lever 2: Increased supply chain liquidity

Logistics influences indicators such as economic value added (EVA) and return on capital employed (ROCE). It can free up liquidity by increasing inventory turns and

inventory accuracy, through raw material disposition, and with just-in-time solutions.

Lever 3: Smart investments in logistics assets

Chemical companies often balk at investments, and a logistics service provider (LSP) will only invest with long-term contracts in hand. The solution is collaboration. Industry, suppliers and service providers can identify assets needed for each supply chain. Partners can create optimal asset structures for each value chain.

Lever 4: Standardized safety across the supply chain

In-house, most chemical companies manage safety very well. But challenges arise outside plant gates, notably during transport and at transfer points. To avoid bad surprises, companies must ensure consistent, minimum safety standards across the entire supply chain with a dedicated Supply Chain Management Safety strategy. As a general rule of thumb, 1 to 3% of value chain turnover should be invested in safety.

Lever 5: Differentiated logistics services

Different market requirements engender one of two basic types of chemical supply chains: lean or agile.

Often found upstream, lean firms view logistics as a cost. Concentrated downstream, agile firms focus on the service side and make logistics a competitive advantage. With commoditization happening across all chemical subsectors all businesses are finding it harder to win with differentiated products – but the solution is a tailored logistics strategy. “Successful companies tailor their logistics service to business units, product lines and customers,” says Michael O’Hara, Global Head of Chemicals, DHL Global Forwarding.

700
MILLION

The amount (in tons) of materials and goods the chemical industry moves around the world every year.



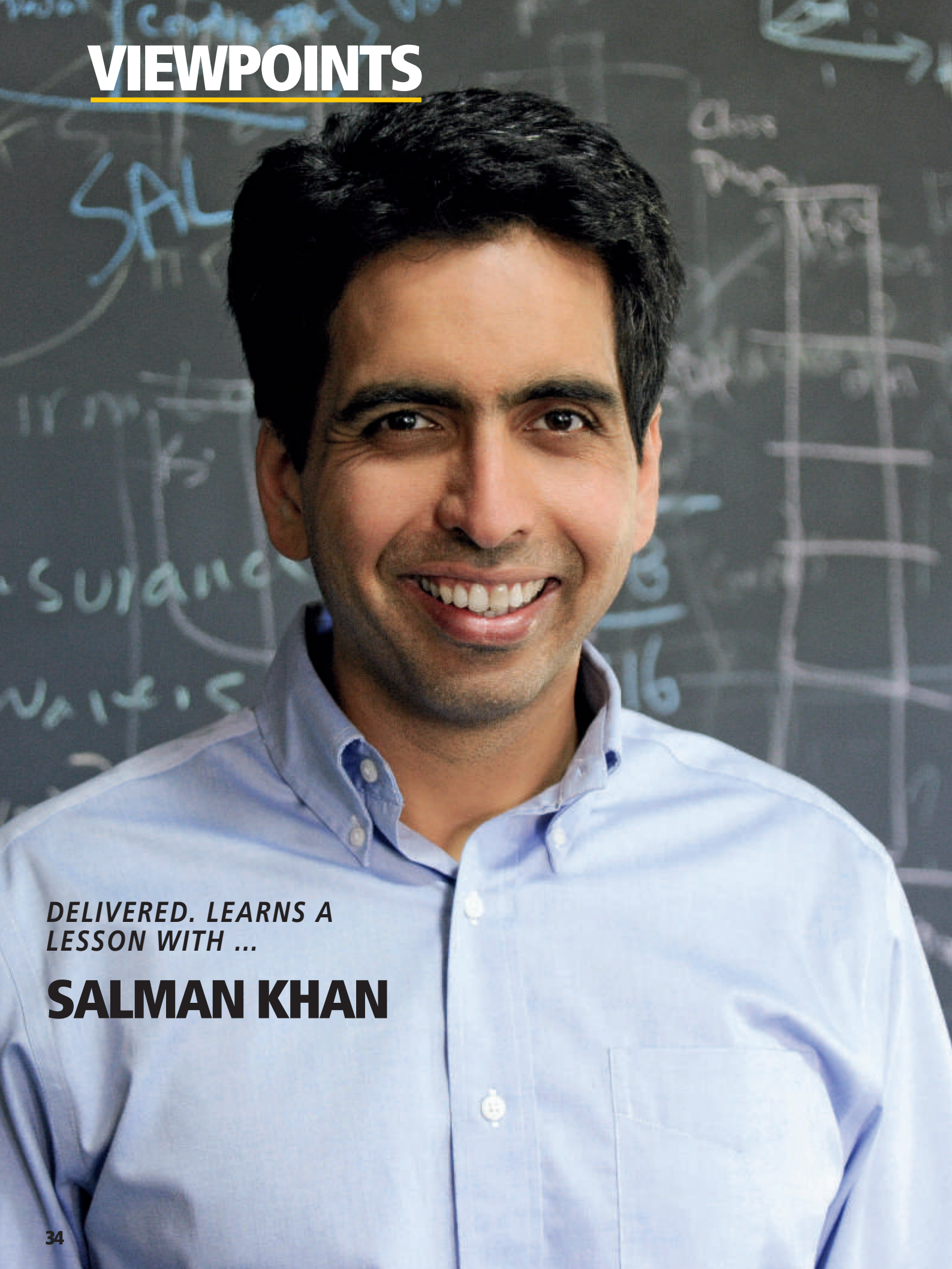
Download a copy of the report here:



tinyurl.com/del-chemical

Overall, the white paper argues that, with a more strategic approach to supply chain management, chemical companies can establish real competitive advantage – an opinion echoed by Gerhard Blaess, Senior Global Category Manager – Logistics, Axalta Coating Systems Germany GmbH. “Logistics and Supply Chain Management will be one of the most important strategic levers for the chemical industry in the future,” he says. ■ *Bill Hinchberger*

VIEWPOINTS

A portrait of Salman Khan, a man with dark hair and a light blue button-down shirt, smiling. He is positioned in front of a chalkboard filled with handwritten notes and diagrams. The word 'VIEWPOINTS' is printed in large white letters at the top left, underlined with a yellow line.

*DELIVERED. LEARNS A
LESSON WITH ...*

SALMAN KHAN

In 2008, Salman Khan set up a free online learning resource called Khan Academy. He explains why it has been a real educational experience both for him and for millions of his students around the world.

In 2006, to help his cousins pass their math exams, hedge fund manager Salman Khan made a series of video tutorials and posted them on YouTube. Some time later, two things dawned on him.

The first, he says with a smile, was that his cousins liked him better on YouTube, rather than in person. “That’s because they could ‘pause’ me,” he says. “They could repeat what I was telling them without feeling as though they were wasting my time. They could watch my tutorials at their own pace and they liked that.”

They weren’t the only ones. Khan’s second revelation was that his videos were being watched by other people – not just his cousins. “People would leave comments saying: ‘This is why I passed algebra class and why I don’t feel stupid anymore’. Wow! I helped someone I’d never met pass algebra? So I knew it was a good idea.” It didn’t hurt that Khan is a natural communicator, and his videos are funny and inspiring as well as educational.

Nine years later and Khan Academy, founded in 2008 and supported with philanthropic donations, has grown to become a global teaching phenomenon: a non-profit organization with a mission to give a world class education to anyone, anywhere, via a series of free online materials and resources. Based in California and with around 60 full-time staff, its videos have been translated into almost 40 languages and include everything from art history and cosmology to entrepreneurship and multivariable calculus. To date, the Academy has delivered over 440 million lessons; plus 900,000 registered teachers around the world use it to help inspire and motivate students. No wonder Forbes described it as ‘reinventing education’.

“I gave a talk at the University of California, Berkeley, recently,” says Khan, “and a lot of the kids told me that they had been using our videos since eighth grade. That’s really gratifying. At the same time, there’s a feeling that we can’t mess this up. It’s too important.”

Why do you think your videos made such an impact?

I wasn’t the first person to make math videos on YouTube, but I like to do things in a conversational way. Getting big ideas across by being respectful, letting the listener hear the joy in my voice – and not being afraid to laugh – were common sense to me. Sometimes I’ll be solving a math problem by going down one avenue when I’ll stop and say: ‘Oh no – wait. It’s supposed to be like this.’ And people enjoy that because they relate to it.

What are the main challenges you faced when you started?

I wanted Khan Academy to be a non-profit organization and there was no model for that. After I quit my job, people didn’t

know what to make of me or my idea. But as we grew, they could see that we were – and are – driving measurable impact. We have validation from the students watching the videos, from schools that are using us to show real outcomes, and from the College Board in the US, which has made us the official preparation resource for the SAT (the college admission exam). But philanthropists understand data, impact and scale. So they ‘got’ what we were trying to do.

You’ve been called “the world’s first superstar teacher.” Do you recognize that?

The press likes a snappy headline and hero narrative. Maybe I did hit on some type of trend, zeitgeist or need. But it’s a whole bigger story now. It’s not just about me.

You have made teaching videos in subjects that are not your field of expertise. How did you do that?

Sure: I’ve made videos about history and organic chemistry, for example, which are not domains I’m an expert in. But I like learning things and immersing myself in unfamiliar subjects, so I would spend several weeks reading and talking to friends and asking questions until I ‘got’ it. In traditional education, everything is so closed off. People who are good at history aren’t supposed to be good at math, for example. Hopefully this gives students a new perspective because they are seeing my videos and thinking: ‘This is the guy who did calculus ... and now he’s doing the history of the Cold War!’ So it’s all learning – and all equally fun if you have the right mind-set.

What’s next for Khan Academy?

We want to drive deeper engagement with students and become a regular part of their learning habits. And in 10 years I hope we are reaching 100 million students every month across an ever broader range of subjects.

How do you de-stress?

Relaxing is important for me. We have a big walking culture here, and even have meetings while going on a walk. That works wonders for stress levels. I also like to read science fiction, play my guitar and try to paint every now and then.

What’s the best thing about your life?

I consider myself the luckiest person on the planet. I have a beautiful wife and three hilarious kids. I get to wake up in the morning and go to work with incredible people on an incredible mission. We have a shot at impacting a lot of people’s lives: maybe even billions one day. I can’t imagine a more blessed life. ■ Tony Greenway

440
MILLION

The number of lessons Khan Academy has delivered to students around the world.



[tinyurl.com/
del-khanacademy](http://tinyurl.com/del-khanacademy)

900,000

The amount of teachers registered with Khan Academy around the world

How to Lead in Ambiguous Times

Stability, resilience and relationships are the keys to thriving amid geopolitical crises.



AN ESSAY BY IAN BREMMER

Ian Bremmer is a thought leader and author, specializing in US foreign policy, states in transition, and global political risk. He is the president and founder of political risk research and consulting firm Eurasia Group, the creator of Wall Street's first global political risk index (GPRI) and is credited with establishing political risk as an academic discipline.

A glance at today's headlines leaves little doubt that we have entered a new era of geopolitical turbulence. Acts of terror and violence, humanitarian crises, and public health emergencies are rarely localized events. Instead, these shocks transcend borders, presenting global challenges.

Of course, it's not just our problems that have become global. Most mainstream businesses have operations and business units spread far and wide, and an eye perpetually turned toward expansion. For company leaders, then, geopolitical uncertainty raises critical questions: How can you make decisions, particularly long-range investment decisions in far-flung parts of the world, when so much is in flux? How do you lead your organization through ambiguity to success? Fortunately, companies can survive, and even thrive, in this environment, by focusing on the following three approaches.

1. Strength through stability.

It isn't easy for many business leaders to recognize that the pursuit of rapid growth for growth's sake, a business preoccupation since the Industrial Revolution, is counterproductive today. Undisciplined growth in a time of uncertainty results in unintended

consequences that will limit your company's success and potentially curtail its survival. Leaders must become much more purposeful about the type of growth they pursue and the reasons for such pursuits. After all, you still need to take risks – that is unavoidable, whether you grow or not. But you can approach risk in a more measured, deliberate way.

A prime example of leaders' lack of discipline is reflected in decision-making about China. It's stunning how many companies are going all in on China in pursuit of go-go growth without developing contingency plans (or an exit strategy) for inevitable change inside that country. China's growth comes with significant costs: their competitors supported by the Chinese government continue to grow, while non-Chinese companies surrender more and more of their intellectual property and technology.

But organizations that build an operating model around enduring stability will have an edge. An organization's strength is based on what its people have habitually learned to do together. If this is genuine strength, grounded in competent management of highly skilled people, then the institution becomes an attractor for people who are looking for havens for their money, their business, and their talent.

2. Decentralized resilience.

Resilience is the ability to absorb shock: to evade the worst effects, to reduce the overall impact, and to manage the negative consequences. For companies, this means not being too vulnerable to any one sector or any one relationship. Different parts of the organization also need to have different governance models. That frees people who are truly excellent in what they do to respond more rapidly and adroitly to threats when they surface, so they can reach a profitable, relatively secure outcome. Decentralized enterprises tend to be resilient because, if they get hurt in one place, the business as a whole is still viable.

But decentralization does not mean lack of a central focus. A company composed of multiple business units that have little to do with one another is not truly resilient. It is merely a collection of vulnerabilities, each on a different time line. Coordinated decentralization – within a company, and among companies – is going to be very important in the future.

The Japanese response to the 2011 Fukushima Daiichi disaster is a good example of this type of resilience. By many measures, this was as serious a threat as one can imagine. Yet Japan rebounded economically much more quickly than many expected. The Japanese government, its major businesses, and its people accepted a common challenge and responded with resiliency. That type of response, within a company or a country, can overcome nearly any external threat.

3. Broad and deep relationships.

The success of an enterprise doesn't depend solely on how much value it provides for its clients annually. It can also be measured by the breadth and depth of its associations over time.

Breadth reflects the number of connections a company maintains. Between companies, are communications limited to dialogue among senior decision makers? Or are people throughout both enterprises working closely together? Networks are much more resilient than individual touch points, particularly when a company is doing business internationally. Relations among companies can't depend on individuals who may walk out the door at a critical moment. Networks are vital in times of crisis: if your business loses access to critical resources, you can tap this network to maintain operations until systems are fully restored.

Depth is crucial for the intensity, creativity, and outcome of your company's engagement with others. In a country such as China, the quality of your firm's relationships with local government and business leaders can help you navigate that country's shifting priorities. If you're an energy or industrial company investing in a capital-intensive facility or a consumer products company building up distribution relationships, many of your costs occur up front, but you're likely to stay in that country for a while. What do you bring to the table that the next generation of people in power might find valuable? Providing value for them can sustain long-term endeavors in that country.

Choosing Stewardship

It's precisely because we want metrics for growth and progress that we underestimate and diminish the importance of stewardship in a rocky environment. To be sure, the need for stability, resilience, and relationships may not apply if your business has no interest in long-term results. But that applies to only a small number of enterprises. The success of rapidly shifting investors and of some companies has led many managers to fetishize agility: the ability to turn on a dime, to move abruptly to a new sector, region or business model when circumstances change. They are kidding themselves. Most companies can't change that easily. They've invested a great deal of time and money in their existing businesses and their patterns of behavior are much more deeply rooted than they think. In business, as in nature, you can't grow too big and remain agile.

Because you can't be fully agile in ambiguous times, be a steward of your organization. Be stable, resilient, and networked enough to succeed. And remember that if the environment is particularly dire, sometimes simply not ceding ground as you recalibrate for the future is a victory in and of itself. ■

This article has been adapted with permission from *strategy+business* magazine, published by PwC Strategy & LLC. © 2015 PwC. All rights reserved. PwC refers to the PwC network and/or one or more of its member firms, each of which is a separate legal entity. Please see <http://www.pwc.com/structure> for further details. To learn more, read the full article at:



tinyurl.com/del-strategy-business



WHAT'S THE STORY MR. BROWN?

IN THE RIGHT BALLPARK

Harlequins and England rugby player Mike Brown reveals why he is so passionate about the game – and how being a part of Rugby World Cup 2015 on home soil would fulfill a lifelong dream.

It was my dad who started me on this journey and inspired me to start playing rugby. He enjoyed rugby when he was younger – so as soon as I was old enough he signed me up to a local rugby club. I was about five years old, and I stayed there until I was about 15. I played in various youth championships and, in 2002, when I was 17, I was invited to train with the Harlequins Academy (the Academy of Harlequin FC, the English rugby union club that plays in the English Premiership).

What did I like most about playing rugby? I think it's the competitiveness and the sheer physicality of the sport. That's what I still enjoy. After sixth form college I got the call to join Harlequin FC

A QUICK GUIDE TO RUGBY

- Rugby is played with an oval-shaped ball. There are two teams of 15 players on the field and each game is made up of two 40-minute halves.
- There are different ways to score. The most valuable way is to score a try – worth five points – when one of the players touches the ball to the ground beyond the try line (rugby's equivalent to the goal line in soccer).
- Kicking the ball through the upright goal posts is called a goal that is worth two points if it happens after a try or three points during live play. A team can also score from a penalty kick, which is worth three points.
- Players can be tackled to the ground (similar to American football) but once they are on the ground they must immediately let go of the ball. Holding on to the ball can result in a penalty.

THE PEOPLE'S PLAYER

In 2014, Mike Brown clinched the coveted Player of the Championship award for the 2014 Six Nations Tournament, securing over 34% of the public's vote.

230+

The number of games Mike has played for Harlequin FC

26

The number of appearances Mike has made for England

full time. Being selected to play for them, and then for my country in 2007 in a test against South Africa was a dream come true. I love every aspect of playing for England, from the training and game day to how people come up to me and talk really positively about the white jersey.

People ask me which are the best international games that I've played in – and there have been a few that stand out. I scored my first try for England in the 2014 Six Nations Championship match against France; but I would probably choose the game against Ireland in the Six Nations at Twickenham in 2014 as one of the best for me. I was also named Player of the Tournament. Another memorable international game would be England against New Zealand in 2012, where we pulled off one of our greatest victories (England won 38-21, and Brown was named a star performer). Our Six Nations win against France back in February was great for everyone to watch. But, unfortunately, England didn't quite get the points we needed to win the Championship.

Match-fit

During a Six Nations game against Italy earlier this year, I was knocked unconscious and suffered a serious concussion that left me with severe headaches. I took time out for a few months to make sure I fully recovered, but I'm match-fit now and raring to go.

Rugby World Cup is being played in England this year – and, as an Englishman, that's a massive deal for me! It really doesn't get any better than that! As a child growing up it was my dream to gain an England cap, but being a part of Rugby World Cup 2015 would be the very pinnacle of my career. There is nothing bigger in rugby and the fact that the Tournament will be on home turf makes it more special, a once-in-a-lifetime opportunity.

I do think that England is entering the home Rugby World Cup in a position of strength. Our attacking game has been brilliant and has come on in leaps and bounds. Obviously you never know until the time comes around, but I believe we will have the experience – gained at club and country level – to handle what is thrown at us. More than that, we can thrive on that pressure. We have shown how dangerous we can be and hopefully we can take that into future games. I've got two World Cups left in me if I look after myself.

Off the field I like watching all sports on TV – especially soccer and rugby, of course. As professional rugby players, we aren't allowed to play any other sport for fun in case we get injured; but just occasionally we might get in a game of soccer at Harlequins if we have an extra training session. Looking long-term, I might also learn to play golf someday – it would be good to do a bit of 'non-contact' sport for a change! ■



tinyurl.com/del-rugby-twitter

RUGBY WORLD CUP

- England will be hosting the eighth Rugby World Cup from September 18 to October 31, 2015. Forty-eight games will be played in total between 20 teams at 13 venues, including the Olympic Stadium.
- The teams will be playing for the Webb Ellis Cup – a 38-centimeter gilded silver trophy named after William Webb Ellis, the founder of rugby.
- Organizers predict a sellout with 2.3 million tickets likely to be sold. £32 million worth of revenue is expected to come from food and drink alone.



tinyurl.com/del-rugby

EDUCATION IS REACHING THE REMOTEST PARTS OF THE PLANET, **THANKS TO GLOBAL TRADE.**

Throughout rural areas, in countries across developing continents, schools are more accessible. In Sub-Saharan Africa, three quarters of all children now attend primary school, 25 years ago it was about half. For millions it could mark the beginning of the end to poverty. This is the power of global trade. Of course there's still a long way to go, but one delivery at a time, the more we keep on trading the better it's going to get for everyone, everywhere. Read more online.

dhl.com/globaltrade

A young boy with dark skin and short hair, wearing a blue and white striped school uniform, is focused on writing in a notebook with a pen. He is in a classroom setting, with other students visible in the background, slightly out of focus. The lighting is warm and natural.

DHL
EXCELLENCE. SIMPLY DELIVERED.