The future of industries:
Bringing down the walls

pwc

A shockwave in the form of a new industrial revolution is taking place. It's reshaping the foundations of many industries. And it's bringing down the walls between others as the boundaries between suppliers, producers and consumers and, in some cases, between whole industries shift.

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The trick to seeing the future...
is knowing where to look for it.

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Consumer and Industrial Products & Services covers the industries that provide us with many of the physical products and services all around us – from cars and cranes to medicines and electricity, these sectors provide the physical things that are part of everyday life -- automotive, energy, utilities & mining, healthcare, industrial products, pharma and life sciences, retail & consumer, and transportation & logistics.

Introduction

Technological change is creating historic shifts in industry footprints. Over the next ten years, we think this process will accelerate. Traditional industry classifications will need to be rewritten. Where industry boundaries begin, where they end and who are the main players will all be up for grabs in a number of sectors.

The digitisation of everything, the internet of things, advanced robotics, artificial intelligence, machine learning, blockchain and developments such as advanced materials and next-generation genomics are among the technologies that are changing the basis on which industries compete and interact. They are already shaking up the foundations of many industries.

Advanced technologies will become integral to the licence to operate and change the cost economics of sectors. The possibilities opened up by automation, sensors and connectivity provide immense potential to boost efficiency and reduce the cost base. Energy efficiency, for example, has become a core strategic issue for companies in nearly every sector, with technology and data advancement providing opportunities for more active management and, indeed, self-production. And wider energy transformation, decarbonisation and recarbonisation are reaching across all sectors. Companies will need to embrace technological advancements, or risk disappearing.

But in some industries, the revolution will go further. It won't just be the foundations of industries shaking, but the walls will be coming down, as the boundaries between suppliers, producers and consumers and, in some cases, between whole industries shift. We're already seeing this happening and we foresee that it has much further to run.

Across all sectors, we believe we are at a historical inflection point where companies and sectors will either develop to be the advanced industries of the future, some of them with different focal points from the industries of today, or decline to become uncompetitive and obsolete.

What's the impact on your sector? Will we see a new industrial order? Are completely new sectors emerging? Are you in an industry where the new industrial revolution is set to shake the foundations, or is it going further and bringing down the walls? And can you be sure you are developing the capabilities that will ensure you take your place in the new advanced industries of the future?

Norbert Schwieters
Consumer and Industrial
Products & Services

The technology shockwave

The speed and scope of the technological shockwave currently gathering momentum is unprecedented. Previous industrial revolutions were focused on specific technologies – water and steam in the first industrial revolution, electricity in the second, electronics and information technology in the third. Now a multiple number of technology accelerations are occurring simultaneously, at exponential pace, and are disrupting virtually all industries. Tipping points are set to be timed in years not decades.

And what is very different is that, while earlier industrial revolutions were driven by technological advances that were focused initially at least on the production side, many of the advances currently occurring are ones that simultaneously embrace consumers, producers and suppliers. The result is that the technological shockwave is being amplified by customer, producer and supplier behaviour and expectations.

Another big difference is that whereas previous industrial revolutions spurred demand for many resources, the latest industrial revolution is partly all about reducing resource intensity. Developments such as lightweighting, better energy efficiency and controls, the use of sensors and automation to increase efficiency all help reduce resource intensity. The impact of the sharing economy, for example in transport, reinforces this trend by improving asset utilisation.

> *The technological shockwave is being amplified by customer, producer and supplier behaviour and expectations.*

Figure 1: A different future: less than a decade away

Tipping points expected to occur by 2025	% of survey respondents* predicting occurrence by 2025
10% of people wearing clothes connected to the internet	91.2
90% of people having unlimited and free (advertising-supported) storage	91.0
One trillion sensors connected to the internet	89.2
The first robotic pharmacist in the US	86.5
10% of reading glasses connected to the internet	85.5
80% of people with a digital presence on the internet	84.4
The first 3D-printed car in production	84.1
The first government to replace its census with big-data sources	82.9
The first implantable mobile phone available commercially	81.7
5% of consumer products printed in 3D	81.1
90% of the population using smartphones	80.7

Source: World Economic Forum, Deep Shift Technology Tipping Points and Societal Impact, September 2015.

* Expectations from a community of over 800 executives and experts from the information and communications technology sector.

What's powering the shockwave?

The number of technological developments that are happening simultaneously is immense. Some are highly applicable across a range of sectors, while some are more relevant to some sectors than others. And the wider potential of some, such as blockchain, is only now in the process of being realised and discovered. PwC has tracked more than 150 discrete technologies, and has developed a methodology to identify the most pertinent.[1] We highlight the leading developments together with the behavioural changes that are accompanying them.

Our digital human behaviour

Foremost among the behavioural factors amplifying the shockwave are our expectations as digital humans. We're all becoming digital humans, relying on and expecting a digital interface to be the primary mechanism by which we manage and control our lives. By 2020, mobile will account for over 50% of internet access revenue in more than three-quarters of countries.[2] The smartphone is already the digital interface for a huge range of personal, business and entertainment activities, and is setting the pace for our expectations for 'always on' interaction and control at our fingertips.

Connecting with the digital human

Digital interfaces with future smart homes, cars, factories or cities are among the examples of the new forms of digital convenience that lie ahead. But already, chemicals companies are enabling farmers to receive precision agricultural data that combine meteorological, environmental, land and crop data. In medicine, smartphones are changing health relationships, prompting a Wall Street Journal headline to declare "the future of medicine is in your smartphone" with "new tools tilting healthcare from doctors to patients."[3] In parts of sub-Saharan Africa, mobile payment systems have not only meant that digital payments have leapfrogged the development of a more costly formal banking system, but they are changing the nature of the power utilities sector by enabling the spread of solar-powered electrification in the absence of the electricity grid – digitally-controlled micro-power is accompanying digitally controlled micro-finance!

Artificial intelligence (AI)

Software algorithms are capable of performing tasks that normally require human intelligence, such as visual perception, speech recognition, decisionmaking, and language translation. AI is an "umbrella" concept that is made up of numerous subfields such as machine learning, which focuses on the development of programs that can teach themselves to learn, understand, reason, plan, and act (i.e. become more "intelligent") when exposed to new data in the right quantities. Machine learning, whereby algorithms learn from data without relying on rules-based programming, is fast being supplemented by deep learning, with algorithms being able to process many more layers and dimensions than previously imagined.

Current and near reality

Machine learning is already part of everyday life, lying behind a variety of applications across different industries. Deep learning is paving the way for a future where breakthroughs, such as driverless cars, better preventative healthcare and faster drug discovery, move from the realms of science fiction to actual practicality. But well ahead of that future, Gartner predicts that by 2018 more than half of large organisations globally will compete using advanced analytics and proprietary algorithms, causing the disruption of entire industries.[4]

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1 PwC, Tech breakthroughs megatrend: how to prepare for its impact, 2016.
2 Global entertainment and media outlook 2016-20, PwC, Ovum.
3 Wall Street Journal, The future of medicine is in your smartphone, 9 January 2015.
4 http://www.gartner.com/newsroom/id/3192717

The internet of things

The internet of things (IoT) is a fast-expanding network of digitally-connected objects — devices, vehicles and more — embedded with sensors and intelligent computing capabilities. The rapidly evolving industrial IoT (IIoT) connects sensors, software, and networks that enable manufacturing and industrial devices to be connected and remotely monitored or controlled. It opens up immense integration possibilities across the supply chain and beyond to customers. Closely linked with the rise of smart cities and grids, both the IoT and IIoT open the way to a future where a vast array of sensor data and analytics-driven intelligence is available seamlessly in real time.

Changing the economics of industries

A recent PwC survey[5] of over 2,000 industrial products companies worldwide found that they expect automation and digital connectivity will bring them enormous benefits – predicting 3.6% p.a. in cost reductions over the next five years, driven by internal improvements and by working more closely across value chains. They're also expecting to generate 2.9% p.a. in increased revenues by digitising products and services and developing new digital service offerings, all the way through to hosting platforms for industrial ecosystems.

Blockchain

Blockchain replaces the need for third-party institutions to provide trust for financial, contract and other activities requiring authentication and verification. Trust is in effect distributed along the blockchain. Blockchain technology has the potential to disrupt a wide variety of transactions beyond the traditional payments system. Because the blockchain can record and authenticate every stage of a transaction, it could theoretically be used to secure and verify any type of transaction, making it relevant to a wide range of industries, from uses in bills of lading and custody chains in transportation and logistics to supply chain authentication in manufacturing.

Collaborating across the walls

Collaborative technology, such as blockchain, promises the ability to improve the business processes that occur between companies, radically lowering the "cost of trust." For this reason, it may offer significantly higher returns for each investment dollar spent than traditional internal investments. So what's the catch? You cannot get the return by yourself; you must be willing and able to collaborate with customers, suppliers, and competitors in ways that you have never done before.
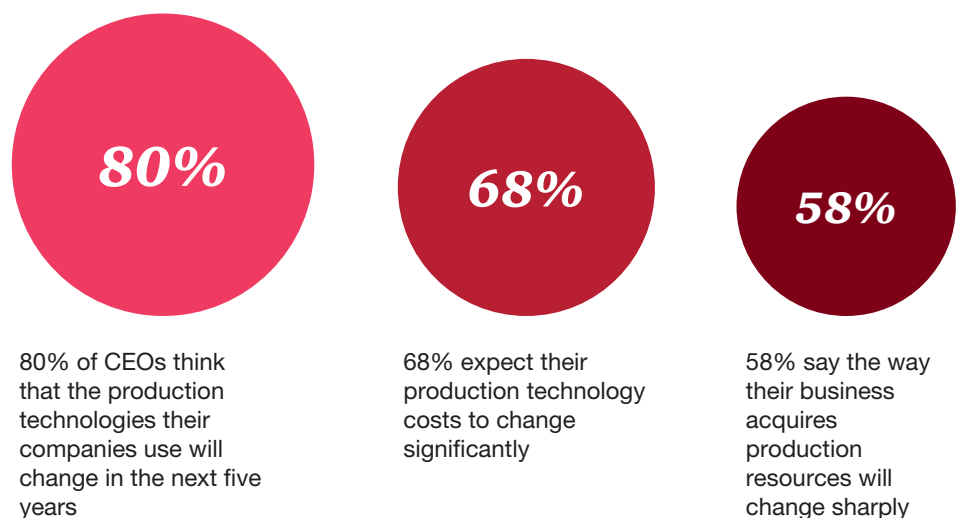
Drones and flying robots

The drone revolution has the potential to go right to the heart of many operational challenges in industries ranging from transportation and logistics, forestry and agriculture, engineering and construction and extractive industries. According to PwC's study on the commercial applications of drone technology, the emerging global market for business services using unmanned aerial vehicles (UAVs) is valued at over US$127 bn. Drones have considerable potential in areas of surveillance, maintenance, logistics, data collection, and so much more.

Adding AI to drones

The current generation of drones can be used for activities such as site monitoring, maintenance, delivery and even urgent medical response by flying blood products, medicines and medical equipment to where they are needed. But the future is one in which artificial intelligence is incorporated into UAVs, especially the use of machine learning software to equip them as flying robots, opening up possibilities such as robotic aerial construction and repairs.

Figure 2: Technology disruptions will impact all industries

80% — 80% of CEOs think that the production technologies their companies use will change in the next five years

68% — 68% expect their production technology costs to change significantly

58% — 58% say the way their business acquires production resources will change sharply

Source: PwC CEO Pulse 2016.

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5   PwC, Industry 4.0: building the digital enterprise, 2016.

Robotics, augmented reality and virtual reality

A range of other technological advancements is appearing, rapidly and simultaneously, in fields as disparate as healthcare and industrial manufacturing. Robotics, for example, is set to revolutionise medical practice as well as a wide range of manufacturing, construction and infrastructure processes. In the oil and gas sector, Royal Dutch Shell has developed a robot to monitor equipment and carry out safety checks at a remote facility in Kazakhstan.[6] Augmented reality (AR) adds information or visuals to the physical world, via a graphics and/or audio overlay, to improve the user experience for a task or a product. AR is distinct from Virtual Reality (VR); the latter being designed and used to re-create reality within a confined experience.

> *"Industry 4.0 basically takes the cost of scale close to zero…. And merging the real world with the virtual world allows us to create what we call a digital twin"*
> — Joe Kaesar, CEO, Siemens[8]

3D printing

3D printing uses additive manufacturing techniques to create three-dimensional objects based on digital models by layering or 'printing' successive layers of materials. 3D printing enables on-site or with-customer production, opening up considerable scope for value-chain disruption and bypassing the need to distribute or transport parts and products.

Operations and augmented reality

At Boeing, factory trainees assembling a mock aeroplane wing worked 30% faster and 90% more accurately using AR-animated instructions on tablets than trainees using instructions in PDF documents. Meanwhile, DHL equipped its warehouse workers with AR-enabled smart glasses that guided them through item picking for order fulfilment, resulting in fewer errors and a 25% increase in efficiency.[7] In the aerospace and defence sector, military aircraft manufacturers are able to use the data set from an aircraft to create immersive and experiential simulation software and training programmes. This can transform the training economics for fighter and other flight crews. Wear and tear on the actual airframe can be minimised and reserved for the missions that matter, reducing substantially the overall cost of operations.

Coming of age for 3D printing

According to a PwC survey of US manufacturers, two out of three companies are already adopting 3D printing in some way—from experimenting with the technology to making final products.[9] But its potential reaches far beyond manufacturing. In the construction sector, buildings have been constructed using robotic arms attached to 3D printing heads, and 3D printing techniques could revolutionise construction methods. In medicine, 3D printing has a phenomenal potential for the rapid construction of precision individual body parts, implants and devices in a range of biocompatible materials.

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6   Shell gets go-ahead for frontline robot to monitor Kazakh site, Financial Times, 13 September 2016.

7   PwC, Technology Forecast: The road ahead for augmented reality, 2016.
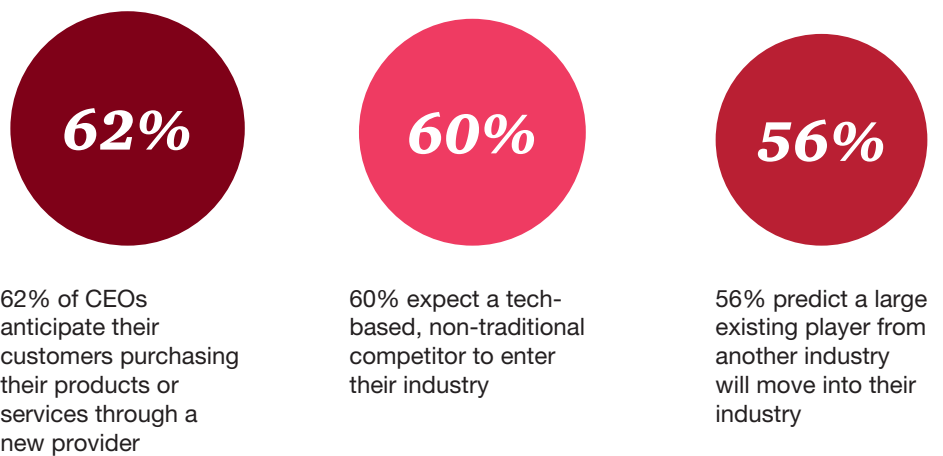
8   Strategy+business, 9 February 2016.

9   https://www.pwc.com/us/en/industrial-products/3d-printing.html

Bringing down the walls

We've already seen the advance pulse of the shockwave in the form of the internet and digitisation bring down walls between industries. Technology companies have become user experience companies. Telecommunications companies have become entertainment content companies. Physical banking has been replaced by mobile phone wallets and hit by disintermediation. Bricks and mortar retailers continue to be swept away by the advance of online retailing.

The second wave of the revolution is now coming in the form of the industrial internet and the simultaneous impact of a number of technologies as well as technological integration between them. It is sweeping through a range of industries, replacing linear value chains with virtual value chains and new digital ecosystems. And in some cases changing the very footprint of industrial sectors. In a series of industry examples, we look at what is happening in a range of sectors and what lies ahead.

Figure 3: The boundaries between industries will erode

62%

62% of CEOs anticipate their customers purchasing their products or services through a new provider

60%

60% expect a tech-based, non-traditional competitor to enter their industry

56%

56% predict a large existing player from another industry will move into their industry

Source: PwC CEO Pulse 2016.

"We see more change in the next five years than there's been in the last 50"
— Dan Ammann, President, General Motors[10]

10 Market Watch / Wall Street Journal, 12 June 2016.

From automotive to mobility solutions

Automotive companies are eyeing a future where they're no longer selling a car but facilitating and personalising 'on demand' mobility. Just as many people turn to their apps when they need a taxi, car manufacturers are conscious of a future when consumers have a similar digital relationship with a mobility service that can provide them with vehicles to match their lifestyle. It could be a big spacious wagon for the weekend away with the family or a microcar for a short trip into the city. Add in the driverless dimension and the potential for asset sharing and it's not difficult to see a future where owning a car becomes the exception rather than the rule.

Automakers have been investing heavily in connected services, new ride-sharing and other transport services, including deals such as Toyota's investment in Uber, VW in Gett, and GM in Lyft. We are already seeing experiments with self-driving car services. We're also seeing the entry into the market of data-centric digital players such as Google, Apple, and Alibaba, all of which are well attuned to the changing demographic of the driving (and non-driving) public. This is changing the industry mindset of how companies see themselves. For example, Uber's chief executive Travis Kalanick commented: "We see ourselves becoming a robotics company in the future."[11]

And there is another change taking place in the automotive sector. The car is already becoming a rich technology space as the online world comes onto the dashboard and cars become more connected. The advent of the 'driverless car' will accelerate the move to the in-car experience becoming the differentiating factor in our car choices. Increasingly, we will expect the in-car experience to be as rich in communications and entertainment content as our home experiences.

From technology to healthcare and pharma R&D

Lifestyle devices are evolving in ways that can give healthcare providers and pharma companies rich data insight. Already the take-up of such devices is significant. Nearly half of consumers responding to PwC's forthcoming Total Retail survey either already own or intend to own a wearable device.[12] Some commentators point to a future of a "health internet of things", in which on-body sensors and home behaviour sensors provide data to enable health professionals to provide real time and early diagnostic services. They point to moves made by both Google and Apple to build a presence in health research data as evidence of the walls coming down between technology and pharma.

The walls are also coming down between health and retail. PwC sees evidence of increasing trust among consumers in non-traditional healthcare delivery channels. For example, a quarter would consider administration of a MRI scan, ultrasound or X-rays at a retail store or pharmacy and 44% would consider going to these places to get a minor ailment diagnosis.[13]

Real time physiological data doesn't just open up possibilities for personalisation and prevention, it also opens up the possibility of a 'laboratory of life', enabling new collaborations between healthcare providers, pharma companies, patients and non-patients to inform innovation in future care and treatment.

But for the full potential of this to unfold, the crucial wall is not so much between the pharma and technology sectors but rather between pharma and healthcare. A true 'laboratory of life' with feedback loops informing future medical research would need access to patient data and records and would need to overcome the significant regulatory and ethical barriers that lie in the way of this.

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11 Financial Times, Tesla powers up plan for full self-driving cars, 20 October 2016.
12 PwC, Total Retail, 2017.
13 ibid.

From electricity to smart home and smart city infrastructure

The century-old electric utility industry is at the nexus of a developing ecosystem that starts with smart homes but stretches out to embrace a diverse range of vital infrastructure. Integrated and automated systems have the potential to bring together energy management, energy demand response, asset management and condition monitoring, city resource use, transportation efficiency and even elderly care through smart software solutions and analytics.

A range of connections between different industries emerges. If electric vehicles become the norm, it will create the need for substantial infrastructure investment and the opportunity to use vehicles as a mass storage source. Local utility networks and circuits would potentially face tremendous strain. Collaboration and shared business models come into view. Power utilities have the potential to capture several sources of value from this scenario but face considerable competition from a range of other players.

Across the walls: smart eco systems

The connections arising from smart building and infrastructure reach far and wide across industry walls. For the defence and security sector, the use of data from CCTV, smart city infrastructure, mobile and internet-connected devices translates directly into new possibilities for security products and services. As well as security data, sensors within buildings can feed back an increasing array of information about building performance and occupancy behaviour, enabling engineering and construction companies to put this data at the heart of future project planning and execution. But it also pitches them into whole lifecycle relationships with the built infrastructure, extending their footprint deeper into lifetime repairs and maintenance and blurring the boundaries with other buildings services such as security and cleaning.

From product manufacturing to value-add services and industrial internet platforms

Companies that previously just manufactured something as mundane as a seal are now able to add sensors that enable predictive maintenance and take this into value-add areas of being able to offer full monitoring, maintenance and renewal services. Such integrated solutions or value-added services are characterised by significantly higher customer benefits and will revolutionise existing product portfolios and performance relationships.

But the race is on to develop and grow the platform ecosystems that will be capable of building critical mass and either sideline or encompass more fragmented offerings from other companies. A platform is a nexus of exchange and interoperable technology, which allows a wide range of vendors and customers to interact seamlessly. The most successful first movers of the software and internet industries all cemented their positions with such powerful and distinctive platforms. First movers in the industrial internet are seeking a similar advantage (see panel).

An effective platform must, by definition, bring the customer close to operations. Industrial companies that share these platforms will also have access to customer data, which will be analysed to better forecast their needs, improve products and develop new ones. Whoever owns the platform thus owns the customer, owns access to the customer, and ends up aggregating the work of a lot of other enterprises.

Across the walls: the race to secure cross-industry positions in the industrial internet

Leading companies such as GE and Siemens are already rushing to strengthen their position as platform providers across a wide range of industries. Each has developed a cloud-based system for connecting machines and devices from a variety of companies, facilitating transactions, operations and logistics, and collecting and analysing data. GE lists no fewer than ten different industrial sectors that its Predix industrial operation system is targeting. Other industrial companies are also moving from simply augmenting their products with digital features to more comprehensive digital offerings. These can range from complete digital solutions to becoming a platform integrator.

> *"We are entering a decade of probably the most dynamic changes in the power grid that we have ever observed in mankind's history"* — Ulrich Spiesshofer, CEO, ABB[14]

14 Financial Times, 3 July 2016.

No industry is immune

All industries will need to be ready to stretch their horizons. Advanced technology adoption will be at the heart of future competitiveness. It doesn't necessarily mean the walls will come down between all industries. Oil and gas, for example, will still be oil and gas in twenty years' time. But we do expect all industries to be transformed by the technology shockwave, lowering cost bases and improving operational efficiency, as well as demanding greater integration with customers and suppliers. In many sectors, it is likely to transform competitive metrics and open up industries to new start-up entrants or incumbents from other sectors.

In the *logistics* industry, for example, some of the sector's own customers are starting up logistics operations of their own, and new entrants to the industry are finding ways to carve out the more lucrative elements of the value chain by exploiting digital technology or new 'sharing' business models. There is a trend towards large industrial or retail customers and suppliers becoming players in the logistics market themselves, not just managing their own logistics but turning that expertise into a profitable business model.

'Sharing' is a big story for logistics now – from innovative approaches to reduce cost and increase personalisation, to more formal JVs and partnerships at corporate level, the whole sector is redefining collaboration. Part of this is the development of the 'physical internet' solutions, based on a move towards more standardised shipment sizes, labelling and systems.

For the 'physical internet' to work in practice, though, many walls would have to come down. Companies would need to be willing to collaborate far more extensively than they do today. For example, most of the 535,000 distribution centres in the US are standalone operations owned by different companies; imagine the savings if they were all connected, and physical workflows were standardised for maximum efficiency.

The *retail* sector was in the forefront of the first wave of the walls coming down, with traditional retailers being eclipsed by more nimble and agile online models. But the realignment of the boundaries of the sector still has a long way to run. We're already seeing an increase in direct-to-consumer brand-building, such as start-up Dollar Shave Club's low-cost online subscription shaving model. It poses a sufficient threat to market incumbents such as Proctor & Gamble's Gillette to have attracted the attention of Unilever, which has acquired it for US$1bn. The move gives Unilever a direct-to-consumer e-commerce channel that cuts out retailers.

We can expect more of such moves. Indeed, the IoT will greatly increase the potential for consumer product manufacturers to get feedback direct from consumers and develop more direct relationships with end customers, again potentially bypassing retailers and realigning boundaries within the sector. Whether it's internet-enabled coffee machines communicating with coffee pod producers or a washing machine connecting with the detergent manufacturer, the potential for greater customer convenience and automation could disrupt the distinction between producers and retailers and see consumer product companies establishing direct relationships with end customers.

Technology has always been a hugely important aspect of the *oil and gas* industry, helping it move to ever more efficient and challenging exploration and extraction. Digitally-enabled technology systems are expected to significantly reduce the cost-per-barrel of future hydrocarbon resource exploitation. The use of IoT sensors can help oil companies have real-time control that could increase the safety, reliability, and yield of thousands of wells around the globe.

The gains of integrating technology and services are bringing down walls in the oilfield services sector. For example, the largest oilfield services provider, Schlumberger, is positioning itself as a provider of integrated services right across the whole exploration and production spectrum. And it is going further by also seeking to transform the traditional procurement model at work in the industry to a more collaborative exploration and production model.

An industry that has traditionally looked within its own walls is now very alert to the possibilities coming from other sectors: "We have spent a century devising and using our own industry's oil and gas technologies, but now we can harness a wave of new technologies that apply across sectors - digital technology, big data, artificial intelligence, robotics, virtual reality and materials science," observed Bob Dudley, BP's group chief executive.[15]

Even an industry as specialised and far up the supply chain as *mining* is not immune to the walls coming down. PwC's Global Mining Transformation report paints a picture of a technology-transformed future: "In this future, players from the health sector bioengineer microorganisms to release coal seam gas, making hydraulic fracking obsolete. Fintech companies use blockchain technology and the data from ubiquitous drones to create tradable units in mines and their outputs and assets are traded faster than ever imagined. Some precious metal ore bodies are kept in the ground, but still traded. High-tech manufacturers develop new 'dry mining techniques', unlocking the potential of ore bodies previously thought to be sub-economic or located too close to environmentally sensitive areas."[16]

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15 Competitiveness, Carbon, Choice - embracing change, Oil & Money conference, 18 October 2016.
16 We need to talk about the future of mining, PwC, 2016.

Staying ahead of the shockwave

We've identified five big issues for companies to consider if they are to thrive and not be thwarted in the revolution that is unfolding.

Have you got an outcomes focus or are you still stuck in a physical product mindset? Products are being replaced by outcomes. Customers will no longer interact with industries and product sectors based on the physicality of their product, but on the outcomes, convenience and value they can offer.

What are you doing to avoid commoditisation of your business? Another boundary shift may involve the traditional distinction between 'business to business' and 'business to consumer'. With the advent of connected infrastructure and online automation, some B2B activities could become commoditised and subsumed within more agile B2C solutions.

Are you building a platform presence? In the coming decade, the development of industrial internet platforms and other platforms that integrate with smart ecosystems is likely to be as significant as the B2C online revolution of the last decade. Automation will play a central role in such systems, and a presence in these platforms will be a vital 'go to market' success factor for many companies.

Are you leading with or being left behind by advanced technology? Across a range of sectors, the rate of adoption of advanced technologies is accelerating fast. Developments such as blockchain, Industry 4.0, machine learning, artificial intelligence and advanced genomics are set to revolutionise sectors as diverse as finance, logistics, industrial manufacturing and pharmaceuticals. At the heart of all these technology-driven changes is the need for companies to step up their ability to digitise and harness data analytics.

Have you got your timing right? Some parts of the shockwave, such as the industrial internet, are upon us now and the next few years will be crucial in determining whether companies stay ahead or get left behind. But in some other areas, companies may have the choice of being 'early adopters' or 'smart followers'. And regulation will play a part in determining in which territories particular technologies and new ecosystems evolve, and how fast. It's no coincidence, for example, that Poland is setting the pace on drones. It was the first in the world to introduce a complete legal framework and institutions regulating the commercial use of drones.

Join in the discussion

This 'Future of Industries' report is one of a number of PwC initiatives to help companies consider how the shockwave of the new industrial revolution will change industries. We want you to be part of the discussion.

- *What will your future industry look like?*
- *Who will be your competitors?*
- *What will customers want?*
- *What will be the winning business models?*

Join in the discussion with PwC leaders and experts.

Global contacts

Consumer and Industrial Products & Services
Norbert Schwieters
norbert.schwieters@de.pwc.com

Oil & gas
Niloufar Molavi
niloufar.molavi@pwc.com

Mining & metals
Jock O'Callaghan
jock.ocallaghan@pwc.com

Power & utilities
Norbert Schwieters
norbert.schwieters@de.pwc.com

Automotive
Rick Hanna
richard.hanna@pwc.com

Industrial products
Joe Herron
jherron@pwc.com

Pharma & life sciences
Mike Swanick
michael.f.swanick@pwc.com

Healthcare
Patrick Figgis
patrick.figgis@uk.pwc.com

Retail & consumer
John Maxwell
john.g.maxwell@pwc.com

Transportation & logistics
Julian Smith
julian.smith@id.pwc.com

Marketing & knowledge management
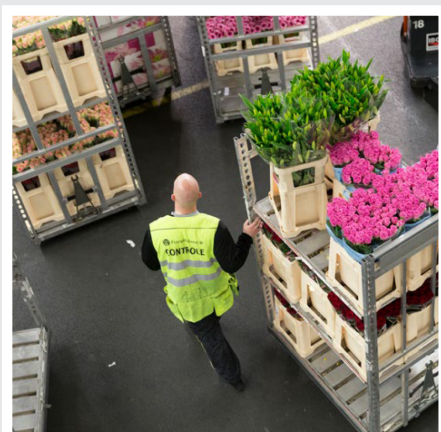**Olesya Hatop**
olesya.hatop@de.pwc.com

Raymond Mingioni
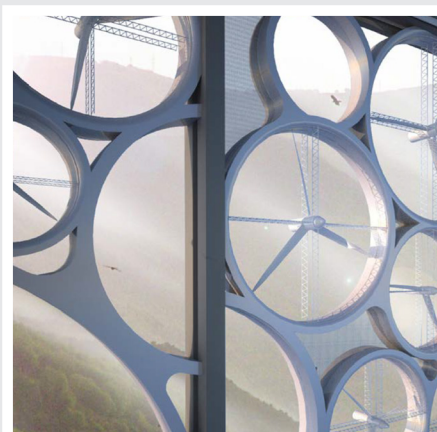raymond.m.mingioni@pwc.com

When we look into the future, we see disruption, we see collisions, we see transformation, but most of all we see opportunities.

What do you see when you look to the future?

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