

**The Fourth Revolution is now:  
are you ready?**

Future of Operations

November 2017



# Why now?

The global economy is in the midst of a new industrial revolution.

We call it the Fourth Industrial Revolution – the latest and possibly the most significant revolution in the underlying structure of enterprise. The Fourth Industrial Revolution is driven by the convergence of computing, data, artificial intelligence and universal connectivity.

This revolution is reshaping operations in every industry. There is no aspect of the economy that is shielded from the transformative effect of this change. Some industries will be altered faster than others: all will eventually be changed.

But change is challenging. Technology is not always your friend. The Fourth Industrial Revolution offers businesses huge opportunities for efficiencies and for insight - but it also creates new competitors, threatens old established modes of operation, and creates new risks to security and reputation.

Deloitte has already explored the impact of Fourth Revolution change in the operations of many industries, from media & entertainment to retail, from banking & securities to power & utilities. This paper synthesizes these perspectives into a single point of view that concentrates on the impact on operations.

We think that operations is at the very centre of this storm of change. Operations is the one function that has a 360 degree view of the scope and potential of digital disruption. That is why the strategic initiative is passing to the leaders of operations.

**So this is a wake-up call for operations – and for business.**







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This paper explores in detail the four key considerations for businesses in the Fourth Industrial Revolution.



1. The **first** is the evolving needs and expectations of the **customer**. Customers have more knowledge, more data and more choice – companies must redesign operating models and platforms to meet changing customer needs. Businesses must optimize, digitize and modernize core processes to achieve operational excellence, whilst always putting the customer first.



2. The **second** is the unstoppable force of **automation**, which is reshaping the world of human work. It is no longer just repetitive processes that can be automated, cognitive technologies are now automating some elements of human decision making. Businesses must identify opportunities for automation and leverage their augmented workforce.



3. The **third** is **alliances and partnerships**. Fourth Revolution technologies enable more collaboration, and the opportunity for businesses to optimize their global footprint and networks. Businesses must identify opportunities for collaboration, both internally within existing teams and externally, building alliances and partnerships between providers and across borders to deliver value.



4. The **fourth** is the need to build a new, leaner **cost structure** that will keep businesses competitive in the Fourth Industrial Revolution. Businesses must redefine their cost structure to enable them to reinvest for growth, reinvest for customer experience, reinvest for transformation and reinvest for the future.

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# Inside the Fourth Revolution

There have been several economic revolutions in the last three centuries. Arguably what is happening today has a greater power of alteration than anything that has gone before. But in many ways it is the old story retold. The story is the rise of the machines.

The first industrial revolution created a new machine manufacturing economy. The second saw the introduction of electricity, the creation of an economy-wide network which spread machines into every home.

The computer era came next, the third revolution that eventually came to dominate the second half of the last century. For the first time machines began to encroach on human brain-work.

What we are seeing today is the Fourth Industrial Revolution.

There is no single technology here. There is no single driving idea. This is the era of creative convergence, where technologies begin to connect. It is something comparable to the great evolutionary transition from single celled organisms to functioning organic networks.

Computing and communications converged to initiate the internet. Mobile networks, cheap data storage and affordable processors made it universal, creating the infrastructure for the Fourth Industrial Revolution.

Digital disruption, automation, big data – these are the forces of the Fourth Industrial Revolution. Cloud computing and the imminent roll out of 5G mobile networks have only pushed harder on the accelerator. Organizations need a new vision and operating model that leverages all of these new technologies; real value can only be delivered when these technologies are used together. Operations leaders must change the way they think and direct these technologies, not be directed by them.

Many have seen this change coming. But it is turning out to be much more powerful than anyone imagined. Technology is now ubiquitous. Automation, AI and cognitive tools are enabling us to do many things very differently. Decisions, services and operations are now augmented processes. We have gone from changing the way we work, to changing the way we think.

We are not waiting for this revolution. It's arrived, it's happening now. And the implications for business operations are immense.

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## What digital disruption?

Is the concept of digital disruption over-sold?

Some believe so – perhaps because any technology that changes the way people relate to each other always causes concern, and initial disbelief.

Today relationship-changing technology is advancing at a faster rate than ever before. There is a debate on why this rate of change has increased, but the data on the rapidity of change are absolutely clear.

Four decades ago no one owned a computer. A decade ago the pocket computers we call smartphones didn't even exist. But today just about everyone in the developed world has at least one

smartphone, if not two. Households in OECD countries with two teenagers had 10 connected devices in 2012. By 2022 this is expected to be 50. And each one of those devices has thousands of times more computing power than the Apollo 11 spacecraft.

That is remarkable enough. What multiplies the impact of this computing power is that so many of these devices are connected.

According to Statista, the global statistics portal, there are almost five billion mobile phone users in the world today, two thirds of the world's population. And that is users, not just phones.

What does this technology proliferation and integration mean? What does it mean for business operations? The implications are immense.

The Global Center for Digital Business Transformation polled 636 global business leaders' opinions in 2015 and then again in 2017. They were asked "When do you expect the impact of digital disruption to occur?"

In 2015, 15% of respondents answered "already occurring". In 2017, this increased to 49%. Almost half of those surveyed felt that the change was already happening.

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## Operations becomes strategic

The head of operations used to be responsible for delivering the business strategy. But now the rate of change in operational capabilities is redefining what companies can do. Operations is becoming a strategic role.

And in a world where new functional technologies are proliferating, operations is where change is going to happen. It is the leader of operations that has a 360 degree view of the scope of change in the Fourth Industrial Revolution, and the tools to lead the organization through this change. For the operations function this is a role reversal: operations becomes a change leader.

You must go **from delivering strategy to driving strategy**. What you can do in the era of automation, universal connectivity and networked computing is to redefine your services. You can change the way you design, the way you source, the way you manufacture, the way you deliver: these changes are in the hands of operations, and the operations leader must articulate their potential.



It is the leader of operations that has a 360 degree view of the scope of change in the Fourth Industrial Revolution.

You must go **from evolving your business to reimagining your business.** You're no longer upgrading your business piece by piece. You are no longer making incremental improvements to an existing model. You have to completely reimagine your business.

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### Redefining operations

What is operations?

There are as many answers as there are businesses. Some companies don't even have a head of operations. Some have heads of production, or materials, or quality, or planning.

Our definition is: whatever is at the working core of your business, that is operations. The job of harnessing the resources, the techniques, the technology and the talents you need to do business – that is operations. Or as the Harvard Business Review once put it, the job of the Chief Operations Officer is to be 'Mr. Inside'. But whatever your formal title, operations is now centre stage.

Today the 'inside' – the operational capability determined by fast changing technology – increasingly determines the strategy of the business. This is why we see more cases of Chief Operating Officers transitioning into the Chief Executive role. Operations is becoming the heart of business.

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## Be your customer

The quality of a company's relationship with its customers is becoming ever more critical. Customers are becoming more powerful: they have more data, more choice, more influence. To match that power companies must now **shape operations around customer journeys**.

Consider the increased availability of data and how it shapes the customer journey. The abundance and transparency of data presents a new array of opportunities and risks. Customers have visibility on price, on costs, on quality, and on service levels, all updated and refreshed in real time. Companies can – and do – trade on gaps in customer knowledge, but those gaps are narrowing daily.

It means that companies cannot any longer afford to concentrate on one or two channels of information and influence. They cannot rely on the brand to do all the heavy lifting for them. They have to know their customers at a level of detail and insight that was unimaginable only a decade ago.

For Life Sciences and Healthcare organizations, this focus on the customer takes on a whole new meaning. Powerful forces are transforming healthcare from a provider driven marketplace to a patient centric health ecosystem. These changes are driven by many of the same factors driving change in other industries – globalization, heightened transparency expectations, and an increased exposure to innovative technologies. These forces are requiring operations within the industry to become more agile, acquire new capabilities across the value chain, and adopt new business models. All to bring much needed drugs to market that reflect patient needs.

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These changes are occurring across industries. Customers are differentiating, with unique sets of wants and needs. Some customers want ethically sourced products, some want locally sourced products, some prefer price over convenience and some the other way around.

Deloitte's own work on millennial buying behaviors worldwide shows that the new generation of customers is a lot less sensitive to many of the messages companies are accustomed to sending. They are self-directed. Personalization and experience are becoming ever more important to these customers – especially in mature markets.

How do you track this chameleon customer? How do you respond at a service level? The answer is out there, in data that can show you what an individual's deeply rooted buying dispositions are. But you have to find it, recognize its meaning, and apply it.

This is at the heart of the operations challenge. In the end, the choices business make as they adapt to the Fourth Industrial Revolution have to be about the customer.



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### The challenge is to reimagine

What does 'reimagining' a business actually mean?

Think of delivery. Once the last and least exciting link in the value chain – but today the Fourth Industrial Revolution has elevated delivery into a key differentiator. You can completely change the types of goods and services that you supply by delivering them differently.

Deloitte's insights into the Future of Mobility look at how automated vehicles, integrated technologies and the way in which we move goods and people is transforming the traditional supply chain. Think of drones, of driverless vehicles, of how these new technologies can be integrated with new manufacturing techniques – and suddenly it becomes clear that companies can change the actual products and services they provide.

Speed of delivery becomes a necessity, not an option. Not just same day but same hour delivery, at very low cost. We expect to be able to order a hot pizza for delivery within the hour – as long as we are close enough to the pizza oven. But how about immediate delivery of a custom manufactured industrial part, wherever you are?

Cost of delivery changes out of all recognition. Driverless vehicles drive 24/7. Empty night-time highways become a memory.

The new transportation ecosystem presents a host of opportunities. New infrastructure and delivery coordination industries will spring up. Mobile entertainment will become a new media industry. Companies will be free to completely reimagine what they deliver to their customers.

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## Automate for efficiency

Businesses must **leverage their augmented workforce**: that means redesigning processes with automation and cognitive tools in mind. Automation is already embedded in business operations, but its impact is now spreading and multiplying. High level cognitive tasks are becoming automated as humans are increasingly augmented by machines. It is when automation comes together with data, cognitive tools and efficient core platforms the true value is realized.

Technology is moving humans up the value chain. Fourth Revolution technology has already boosted employment in knowledge-intensive sectors such as medicine, accounting and professional services. This means that increasingly skilled workers will concentrate on skilled activities.

Yet robots do not 'take jobs'. Our studies have uncovered plenty of evidence that the very opposite is happening. A recent Deloitte UK study concluded that in the last fifteen years over 800,000 jobs have been lost to technology but 3.5 million have been created. Each one of these new jobs pays on average £10,000 more per annum than the one lost, and the study estimated this technology-driven change has added £140 billion to the UK's economy in new wages. Meanwhile robots work 24/7, which means that humans don't have to.

And robots are accurate. The cost of quality in business operations often comes down to the cost of correcting human error. Intelligent automation offers the promise of much higher quality at much lower cost, while humans can focus on what they do best, which is innovation.

This has huge implications for the offshore low cost labor model that has driven globalization to date. While an offshore employee costs on average approximately 35% of the cost of an onshore employee, a robot costs just 10% of the cost of an onshore employee.

Offshoring, just for wage arbitrage, is yesterday's story. Tomorrow's story is the growth of technology-driven employment in all economies. For businesses collaborative offshoring will continue to be a vital component of strategy, but the focus will become one of freeing up talent to concentrate on improving customer experience. Governments too are coming to the realization that automation has the capacity to redirect talent away from mundane tasks, and towards a better focus on the citizen whilst keeping processes onshore.

Some industries will be changed faster than others. Deloitte's research suggests that businesses with high levels of administrative roles, skilled trades and machine operations are likely to be transformed out of all recognition in the coming decade.

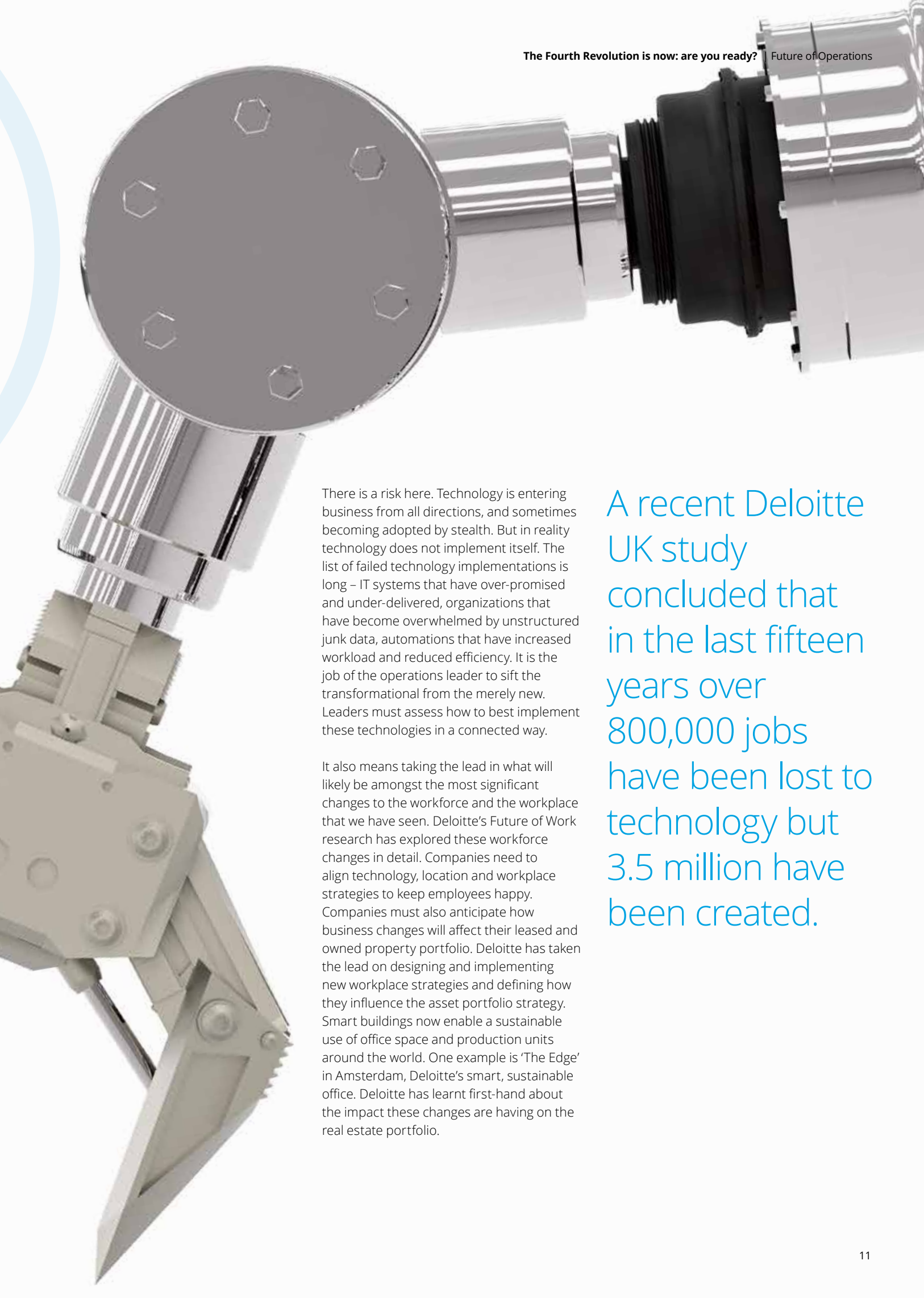
Higher-level tasks involving complex decision-making will be next.

When academics at Michigan State University and the South Texas College of Law recently created an algorithm to predict historical Supreme Court verdicts using only data available before the decisions, the programme predicted over 69% of decisions correctly (that is higher than expert panel prediction rates).

Think of how such decision-making abilities can pervade business operations. Deloitte's Cognitive Advantage research has already shown how specific industries can transform decision-making and work through such cognitive technology. In our Future of Decisions research we have shown that poor decision-making based on confirmation bias, loaded expectations of outcomes and lazy consensus can all be improved by combining cognitive technology with behavioral insights.







There is a risk here. Technology is entering business from all directions, and sometimes becoming adopted by stealth. But in reality technology does not implement itself. The list of failed technology implementations is long – IT systems that have over-promised and under-delivered, organizations that have become overwhelmed by unstructured junk data, automations that have increased workload and reduced efficiency. It is the job of the operations leader to sift the transformational from the merely new. Leaders must assess how to best implement these technologies in a connected way.

It also means taking the lead in what will likely be amongst the most significant changes to the workforce and the workplace that we have seen. Deloitte's Future of Work research has explored these workforce changes in detail. Companies need to align technology, location and workplace strategies to keep employees happy. Companies must also anticipate how business changes will affect their leased and owned property portfolio. Deloitte has taken the lead on designing and implementing new workplace strategies and defining how they influence the asset portfolio strategy. Smart buildings now enable a sustainable use of office space and production units around the world. One example is 'The Edge' in Amsterdam, Deloitte's smart, sustainable office. Deloitte has learnt first-hand about the impact these changes are having on the real estate portfolio.

A recent Deloitte UK study concluded that in the last fifteen years over 800,000 jobs have been lost to technology but 3.5 million have been created.









## Collaborate to thrive

Businesses must **build alliances and partnerships to deliver the new.** That may mean building a more responsive service delivery network. That may mean optimizing the global footprint, not just to minimize costs, but also to access new pools of talent and to mitigate risk.

All of this is going to create some very real collaboration challenges. If digital disruption is the challenge, the collaborative mindset is the response.

One dimension is internal. It is the nature of technology to enable greater collaboration across operations teams. Knowledge silos within firms tend to be broken down, as information technology improves access to data. Companies will rediscover – if they did not know it already – that customer service is a team sport.

Growing the business ecosystem with external partners and suppliers is the other collaboration challenge. We live in an era when technology is making it easier to form seamless alliances and partnerships with external parties who can deliver different parts of the value chain.

Previously companies outsourced process and parts of the business to global in-house centres or captives offshore, allowing them to concentrate on cost reduction in their core businesses. But now new start-ups and technology companies are taking parts of the value chain and delivering it quicker, easier and cheaper. Companies that for reasons of size, or location, or sector found it hard to benefit from offshore opportunities are now accessing the distributed value chain much more easily.

For example: we see this in the way that FinTechs and crowdfunding platforms are redefining the role of traditional banks – in Deloitte's recent work on financial risk management we have already explored how this Fourth Revolution in finance is likely to result in the emergence of a new risk management model where the banks that survive are the banks that learn to collaborate.

For some companies, the mind-set has changed, and with it the shape of operations. For others, the change is yet to come. We believe that many companies need to re-organize their front, middle and back office functions to perform as one team, to service the end-to-end customer journey – and that means collaboration.

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## Redefine your cost structure

Fourth Revolution technologies create opportunities to **redefine costs and reinvest for the future**. Businesses need to use savings to enhance customer experience, deliver large-scale transformation and reinvest for the future.

Cost has always been at the top of the list for any operations leader.

The structural costs of operating are increasing. Companies see increasing resource costs, and increasing regulatory costs. Outputs have to be of a higher quality and produced faster; firms must now be more productive with fewer resources.

Operations leaders have to balance cost with other competing demands – like investment in innovation, engaging customers in new ways, trial and adoption of new technologies, corporate social responsibility and sustainability costs, and the certain increase in environmental impact costs.

Traditionally this is the trade-off challenge: spend to update legacy platforms or invest in new technologies that may be untested, and may be wrong. Meanwhile smaller, more agile players do not have the burden of legacy systems and costly infrastructure – look for example at the way consumer businesses have been comprehensively disrupted by new entrants with low structural costs. Look at the growth of FinTechs and challenger banks, and how they are taking the high value parts of the value chain. Look at how distribution intermediaries have been squeezed almost out of existence, with 90% of companies in Europe now buying direct from the manufacturer.

But Deloitte's work on digital disruption effects in global companies have shown that strategies for growth and cost saving are no longer mutually exclusive alternatives. The surveys we have conducted in our Thriving in Uncertainty research show that automation and cognitive technology adoption can lead to cost reductions that are much higher than historical norms, while still allowing companies to pursue rapid growth.

The problem is also the solution. The Fourth Industrial Revolution challenges companies to be leaner, faster, and operate at a lower cost. It also furnishes the resources to meet those challenges.

The Fourth Industrial Revolution challenges companies to be leaner, faster, and operate at a lower cost.





# Nobody said it was easy

Never suppose the Fourth Industrial Revolution is without cost. It is taking place against a background of unprecedented mood change.

Social attitudes are changing. Political forces are re-arranging. There is pushback against globalization, against automation, against the Fourth Industrial Revolution itself.

One result is that the economic environment is becoming more volatile. You can see this in currencies, in commodity prices, and we expect asset prices to be affected too. It is becoming harder to plan for the short to medium term.

Regulatory costs have increased. Ever since the financial crisis companies have found it increasingly difficult to make big decisions without involving the regulator.

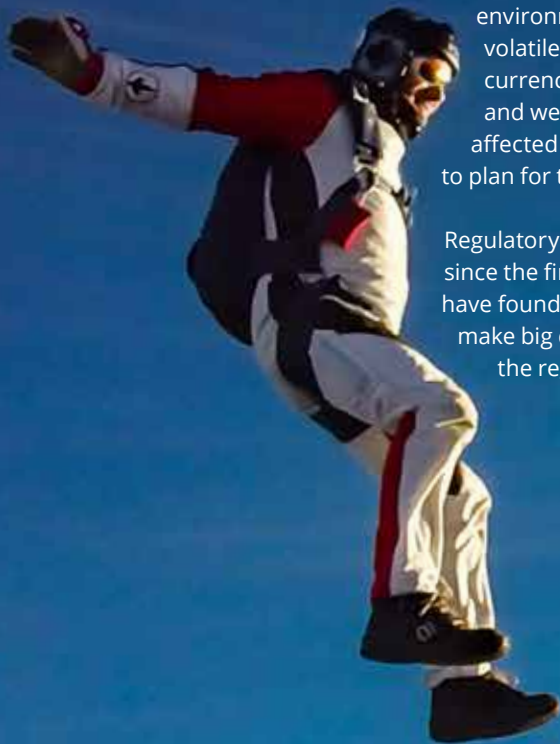
Cyber threats have increased. They have become more sophisticated by the day, and legacy systems cannot keep up.

Economic nationalism is resurgent. Doing business across borders may become more difficult and costly, not easier.

The data that companies hold and how they exploit it will come under scrutiny. Companies need to ensure their data is secure, and that they own customer consent.

Companies will be under pressure on issues around technology adoption, employment, and worker rights in the new economy. They will need to show that their participation in the Fourth Industrial Revolution is a net benefit to society.

We reiterate: when technology changes the way people relate to one another, there is unease. There are arguments to be won. And companies must be ready to make their case. That is the price of change.



## It is time for operations to set the course, and lead.



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### The need to lead

Where are companies headed in the era of the Fourth Industrial Revolution?

Consider the scope of changes we have outlined. Technology is now ubiquitous, and that is forcing a pace of change that is unprecedented. Automation, AI and cognitive tools are enabling new ways of working and higher levels of productivity for early-adopter companies, changing the workforce and the way people and organizations collaborate.

And the customer has changed – the customer has more data, more choice on where and how to buy, and expects a new level of service and accountability from companies. That service is no longer delivered by purely human agents; automation is making service a team sport in which some of the players are robots.

It's a changed world, demanding changed management.

Few companies have fully grasped where they need to be to respond to these changes. Those that are in the process of doing so are changing the role of operations and its leaders. They need to make that change, because operations is where the Fourth Industrial Revolution is happening.

If you are not making this business journey you may already be falling behind.

It is time for operations to set the course, and lead.

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