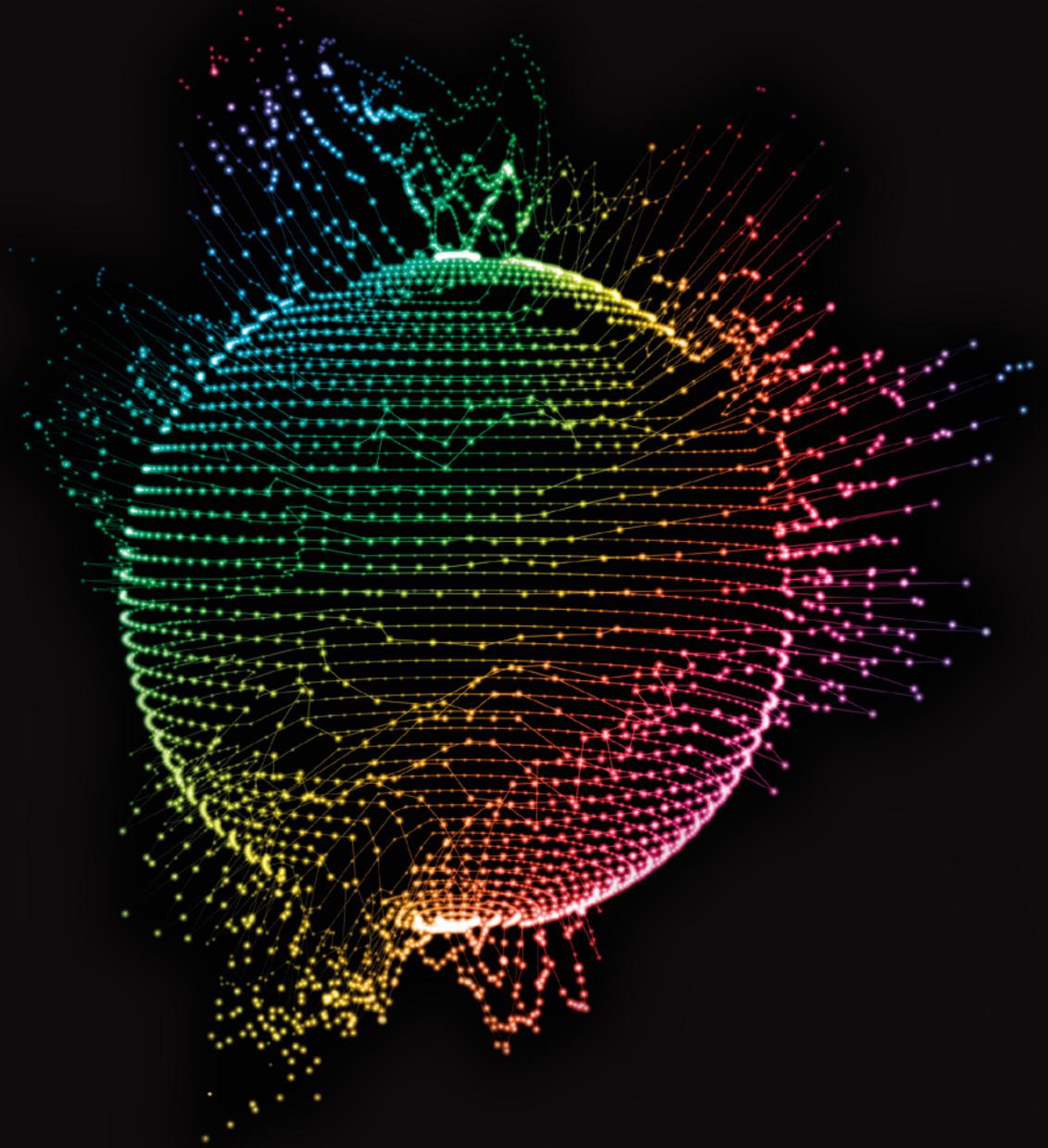


**Deloitte.**



**From experimentation to transformation**

Digital Disruption Index

May 2018

# Contents

Foreword	03
Executive summary	04
A lack of confidence among digital leaders	07
Customer experience is central to digital	11
From experimentation to end-to-end	16
Getting the bigger picture	19
Just around the blockchain?	21
Nothing artificial about investment in AI	23
Endnotes	27
Contacts	28

To join our survey panel and help shape future editions of the Index please contact [ukdigitaltransformationatdeloitte@deloitte.co.uk](mailto:ukdigitaltransformationatdeloitte@deloitte.co.uk)

## **About the research**

Deloitte invited leaders from the UK's most influential companies and public sector bodies to participate in an online survey. One hundred and six executives responsible for digital technologies and ways of working from FTSE listed companies, large private companies and large UK public sector organisations participated in the survey. The combined market value of the 106 survey participants is £707.8 billion, which equates to approximately 27 per cent of the UK quoted equity market. This information, which was collected between February and March 2018, has been analysed in aggregate and forms the basis of this publication. In some Figures, because of rounding, percentages may not add up to 100.

In this publication, references to Deloitte are references to Deloitte LLP, the UK affiliate of Deloitte NWE LLP, a member firm of Deloitte Touche Tohmatsu Limited.

## Foreword

Welcome to the second edition of the *Digital Disruption Index*. This report builds on our initial findings published in 2017, as well as Deloitte's long-standing research into innovation and the future of work.

Combined with insights from our subject matter experts, the Index is designed to help senior executives track investment in emerging technologies and determine the talent and capabilities needed to deliver their digital strategy.

Digital is not just about technology. It is about what technology enables. It can fundamentally change how work gets done, how organisations interact with their customers and how decisions are made.

The pace of technological change is accelerating. In less than 12 months since we published the last Index, we have witnessed significant shifts in investment in new technologies, with the likes of artificial intelligence, augmented and virtual reality, and blockchain gathering momentum. However, in the rush to keep up, our findings reveal many organisations are yet to develop a coherent strategy for investing in these technologies.

Even where organisations have a coherent strategy in place, the vast majority of senior executives do not believe their talent pool has sufficient digital expertise to execute it. Moreover, our results indicate that many senior executives lack confidence in their own digital skills and ability to lead their organisation in the digital economy. Some survey respondents highlight that they and other leaders do not receive the resources they need to develop their own digital skills.

Currently few of the executives we surveyed believe that UK headquartered companies lead the way with the use of digital technologies and ways of working. To help organisations adapt, Deloitte has created a series of experiences that explore the impact of digital on customers, employees and operations. These immersive sessions are experience-led not technology-led and are designed to inspire executives to think holistically about digital transformation. We believe that end-to-end digital transformation is not just about technology but about changing the ways of doing business.

We hope you find the Digital Disruption Index useful and look forward to your feedback.

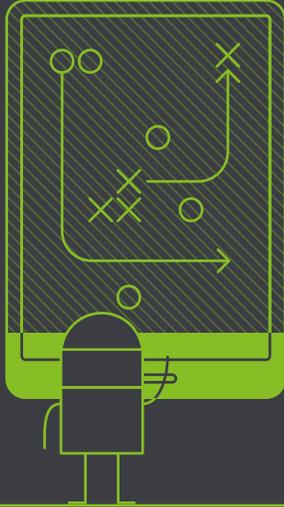


**Oliver Vernon-Harcourt**  
Partner, Digital Transformation

## Executive summary

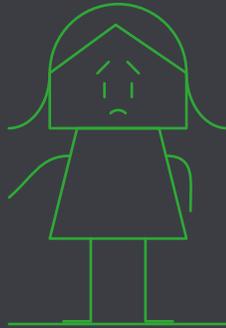
Only **16%**

of executives believe their **talent pool has the capabilities to deliver their digital strategy**



**28%**

of senior leaders say they are **not confident** in their own **digital skills**



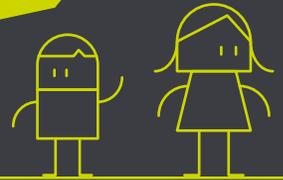
**54%**

do not believe their **L&D curriculum** supports their digital strategy



Only **17%**

believe **UK companies lead the way** with digital



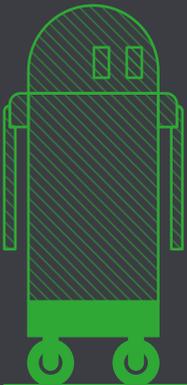
only **12%**

of executives believe **UK school leavers and graduates** have the **right digital skills**



# By 2020

significant investment will shift to:



In 2017 only

# 22%

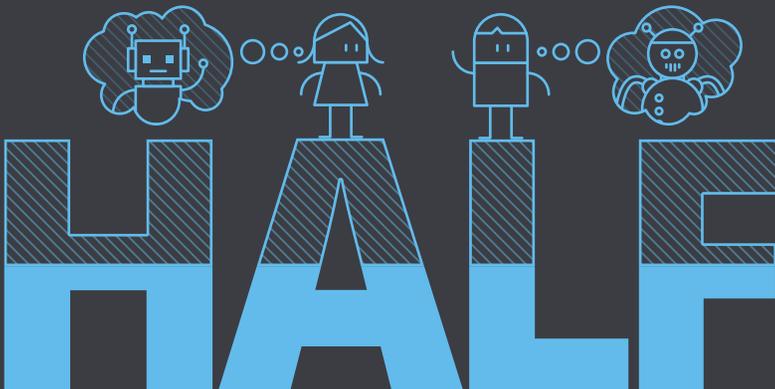
of organisations had invested in **artificial intelligence**



Now

# 41%

of organisations **have invested in AI**



of respondents **do not believe** their organisation's leadership has a **clear understanding of AI** and how it will **impact the end-to-end enterprise**

Executives expect digital to **enable their organisations** to:

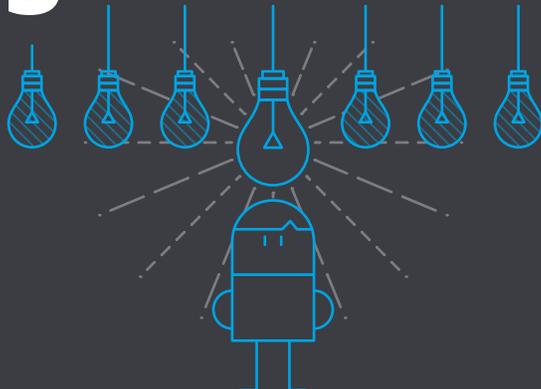
**1** **Create** unique customer experiences



**2** **Deliver** actionable insights



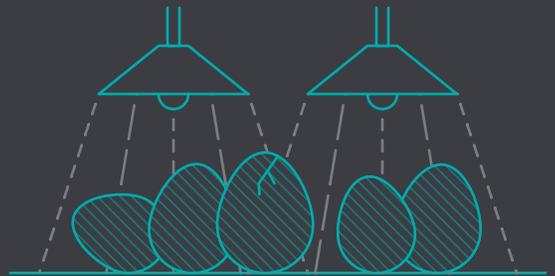
**3** **Enable** innovation



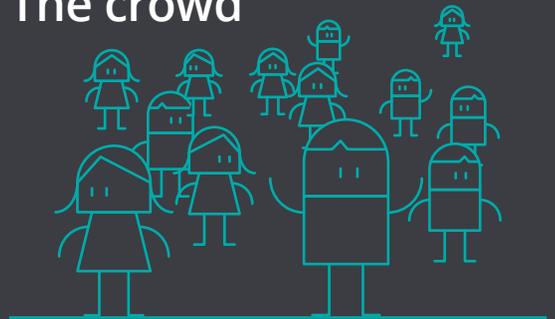
**58%**

have established **new relationships** with **non-traditional partners** and **suppliers** to **deliver their digital strategy, including:**

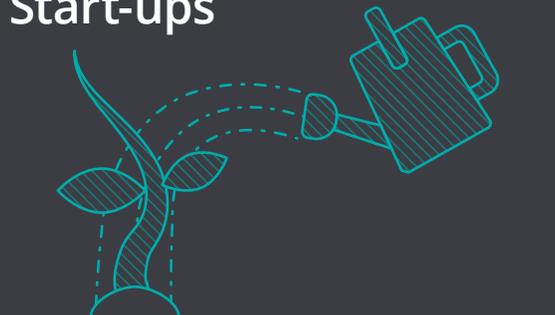
**Incubators**



**The crowd**



**Start-ups**



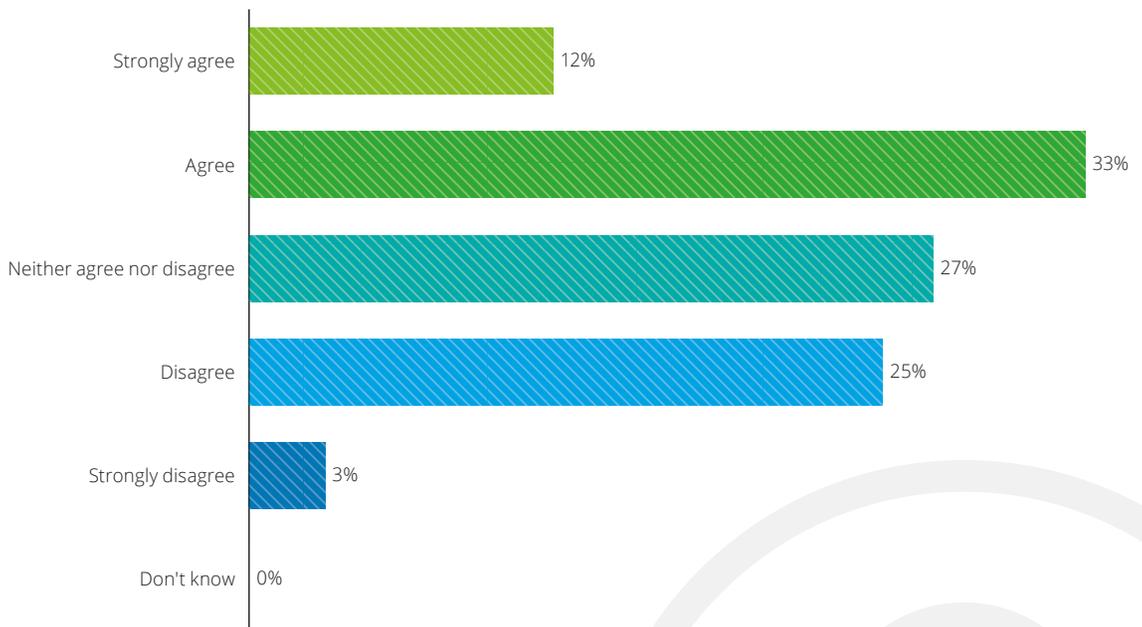


## A lack of confidence among digital leaders

# A lack of confidence among digital leaders

Considering how central digital is to corporate strategies it is concerning that over a quarter of executives are not confident that they have the skills needed to lead an organisation successfully in the digital economy. This lack of confidence is often linked to the apparent lack of resources provided to some executives to develop their own digital skills. Forty per cent of survey respondents believe that they and other leaders do not receive the support they need to upskill.

**Figure 1. I am confident in my own digital skills and ability to lead an organisation in the digital economy**



Source: Deloitte analysis n=106

Forty per cent of survey respondents believe that they and other leaders do not receive the support they need to upskill.

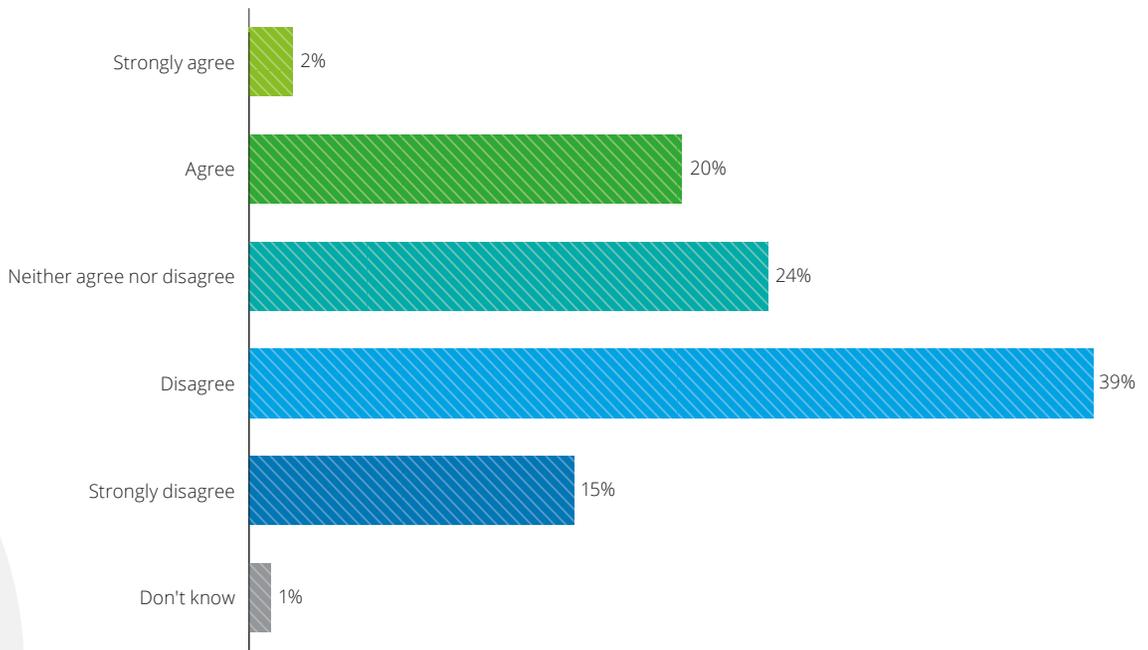


Further to our 2017 survey, digital skills continue to be in short supply. Just 16 per cent of executives believe their talent pool has sufficient knowledge and expertise to execute their strategy and over three-quarters are experiencing challenges in recruiting employees with the relevant digital skills. As with our findings from 2017, data scientists and analysts remain the most difficult roles to both recruit and also retain.

In terms of the UK talent pool, only 12 per cent of executives believe there are enough school-leavers and graduates entering the labour market with the appropriate digital skills and experience. Deloitte research from 2017 also found that 36 per cent of the UK's non-British workforce could leave in the next five years.<sup>1</sup>

With digital skills in such short supply organisations increasingly need to focus on developing talent from within by aligning learning and development (L&D) to their digital strategy. Sixty-eight per cent of executives surveyed said they would prioritise developing their existing employees' skills to strengthen their organisation's digital capabilities. Yet when asked about L&D, 54 per cent state that their curriculum does not support their digital strategy.

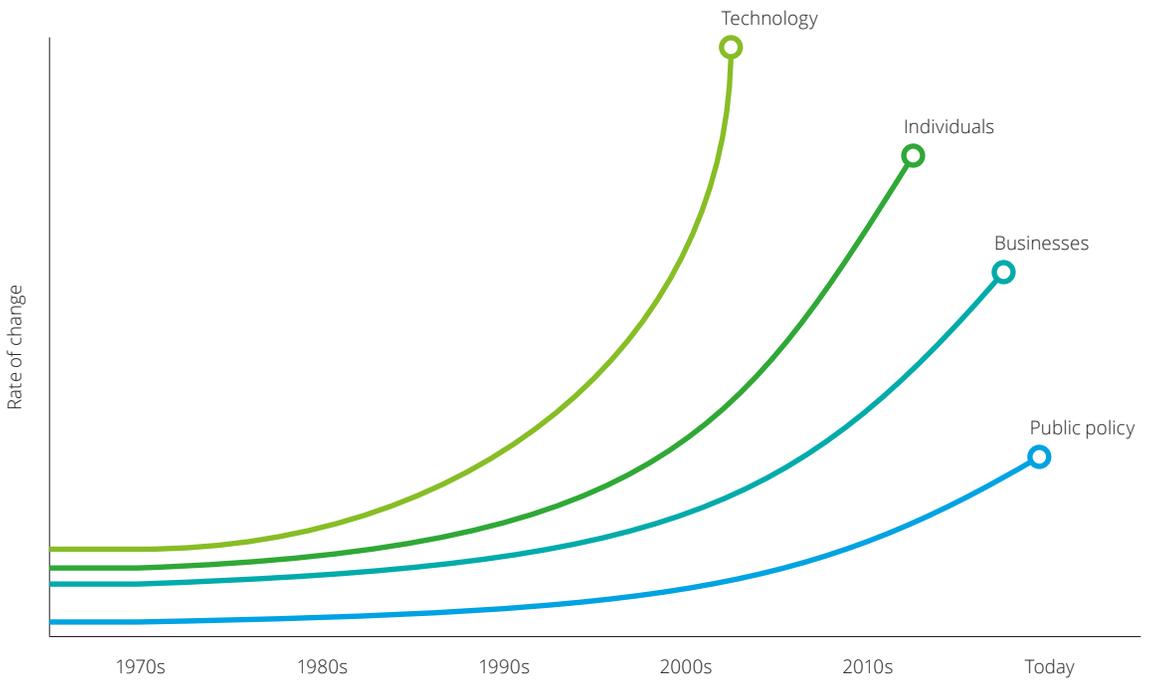
**Figure 2. My organisation's learning and development curriculum supports our digital strategy**



Source: Deloitte analysis n=106

*Human Capital Trends 2017* highlights the lag-time between when individuals, businesses and public policy catch up with technology evolution.<sup>2</sup> People adapt to technology quicker than businesses, and businesses tend to adapt more quickly than public policy (see Figure 3).

**Figure 3. Relationship between the rates of change of technology, individuals, businesses and public policy**



Source: Human Capital Trends 2017

New learning models are required to address disruptive change and digital leaders must influence their organisation's Human Resources departments. L&D curriculums will catch up with the needs of individual workers, and school and university curriculums will catch up with the needs of businesses. However, there will be a competitive advantage for those organisations that close the gap first.

People adapt to technology quicker than businesses, and businesses tend to adapt more quickly than public policy.

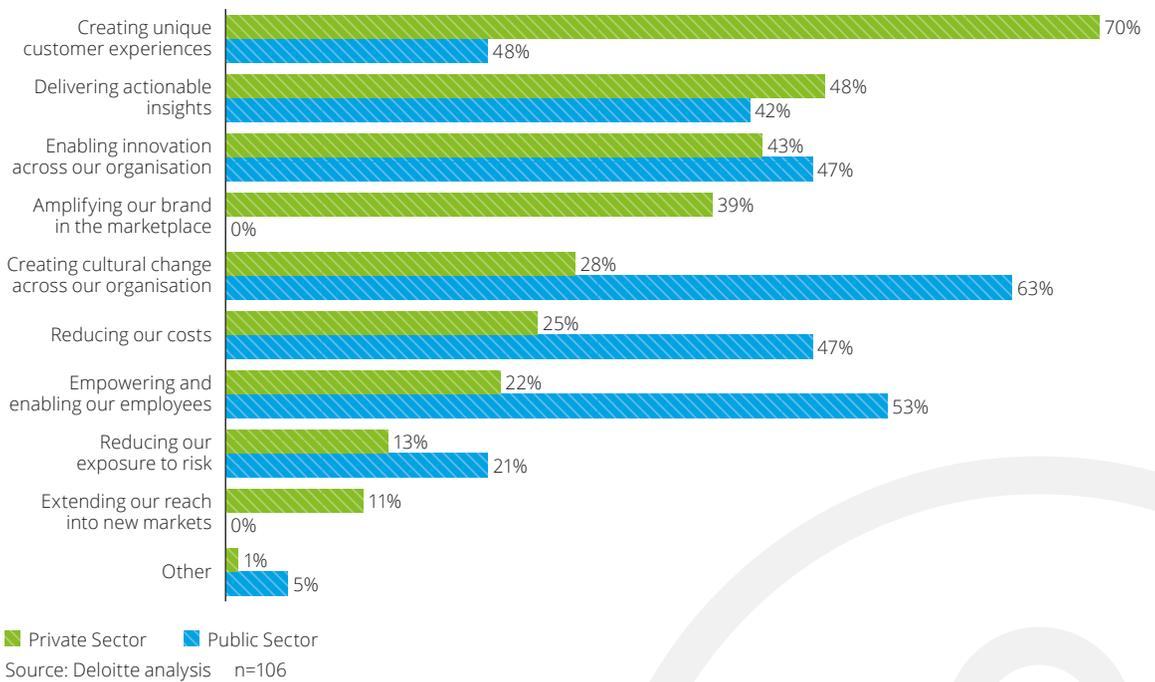


**Customer experience  
is central to digital**

# Customer experience is central to digital

Senior executives overwhelmingly expect digital to have the greatest impact on how they create unique customer experiences. They also expect to see a marked impact on their brand through digital. In the Public Sector the focus is instead on using digital to create cultural change and to empower and enable employees.

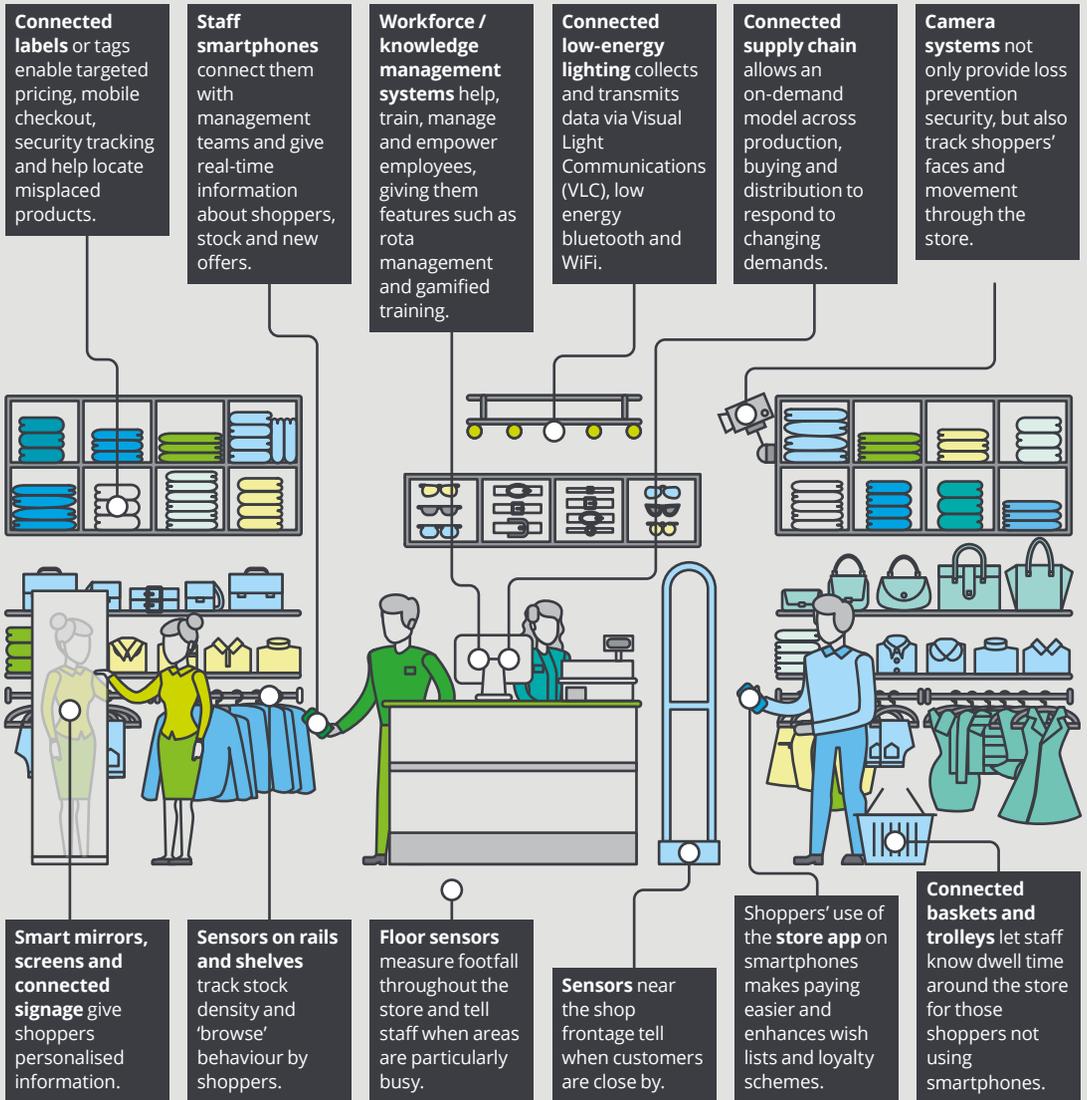
**Figure 4. Expected impact of digital technology and ways of working on organisational strategy (top three ranked)**



Empowered by technology today's consumer expects businesses to react to all their needs and wants instantly. Successful disruptors such as Amazon, Uber and Airbnb have exploited gaps in consumer demand and as a result customer expectations for product and service delivery have been transformed. In this environment organisations are using digital and a range of emerging technologies to enhance and transform the customer experience.

### Introducing the connected store: A digital experience

Deloitte has created *Clerk and Green*, an immersive experience that follows customers and employees as they navigate a digitally connected fashion and grocery retail environment.



The story of user personas helps executives visualise the 'art of the possible' and the value of digital transformation. *Clerk and Green* facilitates strategic discussions on the kind of experiences and value executives wish to create, as well as showcases a range of enabling technologies. It explores themes including:

- personalised content
- digital signage
- loyalty
- inventory management
- mobile self-checkout
- store management
- analytics

All organisations must adapt to create personalised customer experiences, but many organisations are still falling short. Emerging technologies like artificial intelligence offer solutions to meet heightened expectations. This is particularly the case in business-to-business markets, where executives expect the same user experience and pace of delivery as they receive as consumers.

While digital transformation often starts with customer service, the most successful adopters will channel digital throughout their business operations. It is therefore encouraging that 'delivering actionable insights' and 'enabling innovation across the organisation' are high on executives' agendas.

Deloitte's *Tech Trends 2018* uses the following scenario to highlight how executives should not underestimate the impact digital will have on supply chains and back-office functions:

*"IoT sensors on the factory floor generate data that supply chain managers use to optimise shipping and inventory processes. When supply chain operations become more efficient and predictable, finance can perform more accurate forecasting and planning. This, in turn, allows dynamic pricing or adjustments to cash positions based on real-time visibility of operations. Indeed, the two functions begin sharing investments in next-generation ERP, the Internet of Things, machine learning, and RPA. Together, finance and supply chain functions shift from projects to platforms, which expands the potential frame of impact."*<sup>13</sup>

### Introducing the connected supply chain: A digital experience

Deloitte has created an immersive experience where executives follow a coffee bean from cherry to cup – exploring the demand, supply, move and optimise elements of supply chain operations. Executives gain insight into how digital can be used to address key business opportunities and challenges – driving both efficiencies and new revenue streams.

A number of emerging technologies and key concepts are discussed, such as:

- blockchain
- the Internet of Things
- drones, sensors and autonomous robots
- augmented reality and 3D printing
- data ownership and sharing
- cyber-security
- talent



### Introducing the connected employee: A digital experience

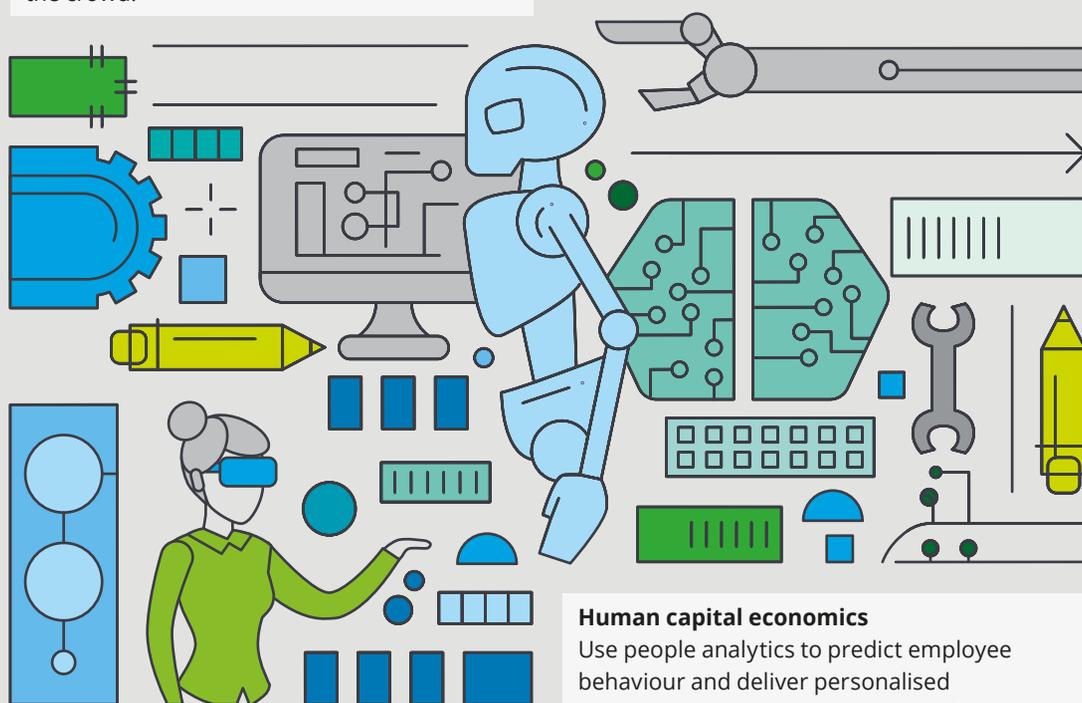
Deloitte has created an immersive experience where executives explore an organisation that is built on an employee-centric culture that drives productivity, powered by new models for talent, augmented by machines, and enabled by digital tools and insight.

#### The augmented workforce

Adopt dynamic approaches to talent planning that take into account opportunities to augment the workforce with artificial intelligence, robotic process automation and the crowd.

#### Success by design

Gain an accurate view of talent across the business, create high-performing teams and use the latest collaboration technology to drive productivity.



#### A new mantra for the business

Build an employee-centric culture rooted in real-time feedback, coaching and continuous development with a focus on team performance.

#### Human capital economics

Use people analytics to predict employee behaviour and deliver personalised recommendations to maximise productivity and retain the best talent.

#### The talent challenge

Create a strong brand, attract the right talent and grow to succeed in a digital environment.

### About our digital experiences

The Connected Store, Connected Supply Chain, Digital Finance and Connected Employee are immersive experiences that help executives understand how digital is disrupting their business models. Half-day or full-day sessions can include one or more of our digital experiences. Our financial services showcase Fusion can also be incorporated as well as real-world experiences such as the Connected Factory in Sheffield and Studio B in London.



# From experimentation to end-to-end

# From experimentation to end-to-end

Isolated, unstructured investment in new technologies will not suffice. Within our survey sample, 38 per cent of executives who indicated that their organisation is investing in three or more emerging technologies in the next two years, stated that they do not have a coherent digital strategy in place. True digital transformation will only be achieved when enterprises successfully link technology across the value chain. Deloitte labels this the *Symphonic Enterprise*, where strategy, technology and operations work together, in harmony, across domains and boundaries.<sup>4</sup>

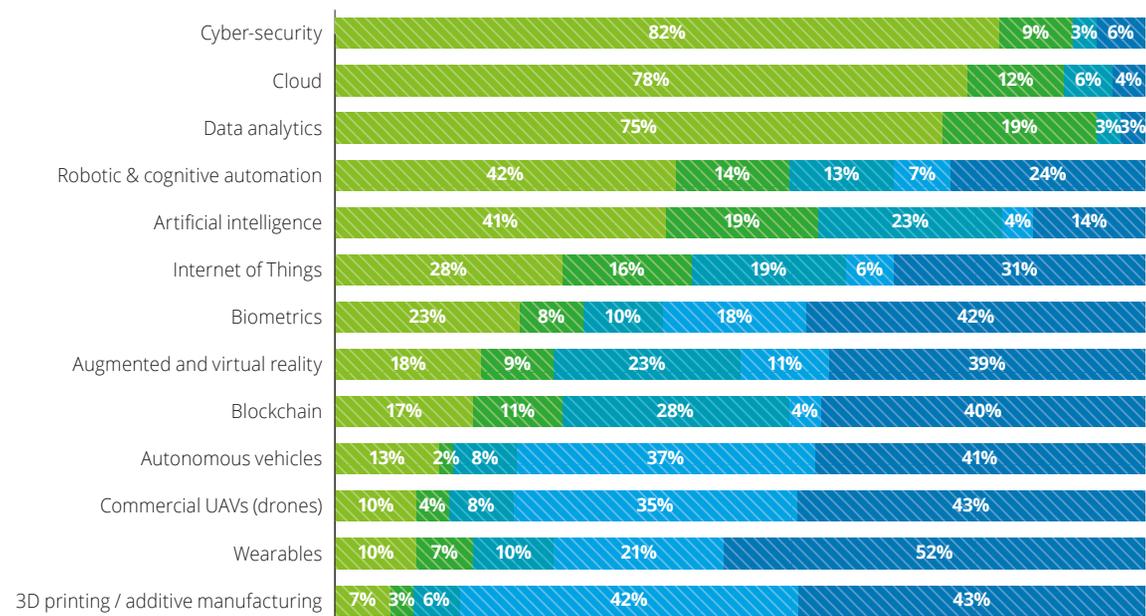
Since our 2017 survey, there has been a shift in investment to more emerging technologies. Cyber-security, cloud and data analytics are now essential, market-established tools for all organisations.

### Definition: Emerging technologies

In this report, refers to any technology which has been invested in by less than half of the survey group (i.e. all the technologies listed apart from cyber security, data analytics and cloud).

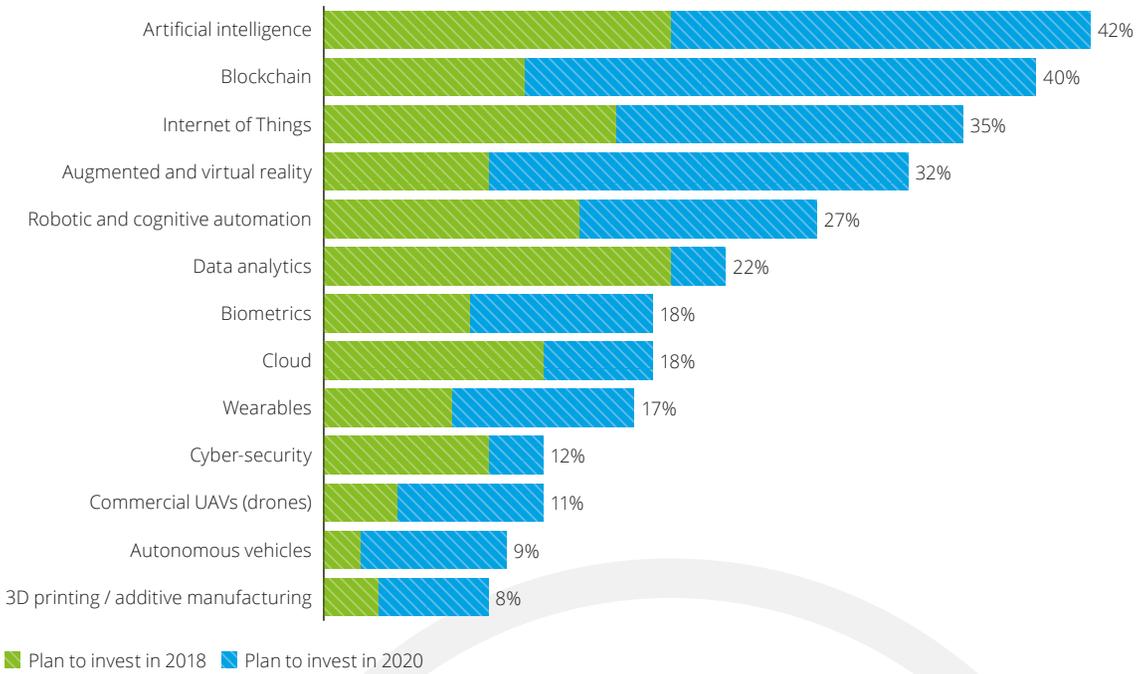
Robotic and cognitive automation (RCA) and artificial intelligence (AI) have seen strong uptake, particularly within the financial services and technology, media and telecommunications sectors. These technologies fall in the middle of the spectrum on the investment timeline, 42 per cent and 41 per cent of executives respectively indicated they have already invested in them (see Figure 5). AI, in particular, has seen significant growth and continues to gain momentum. Indeed, if our survey respondents realise their investment plans, 82 per cent of their organisations should have invested in AI by 2020.

**Figure 5. Investment timeline: Actual and expected investment in digital technologies**



Legend: ■ Already invested ■ Plan to invest in 2018 ■ Plan to invest by 2020 ■ Never ■ Not sure  
 Source: Deloitte analysis n=106

**Figure 6: Expected new investment in digital technologies in 2018 and by 2020**



By 2020, the focus of investment will switch to the most emerging technologies, with blockchain and augmented and virtual reality (AR/VR) earmarked for new investment by 40 per cent and 32 per cent of executives respectively. 3D printing, Commercial UAVs, wearables and autonomous vehicles were also highlighted for future investment, but by a smaller number of executives. While their application at present is restricted to more select areas, as they mature in the long term, their influence will transform the world of work and beyond.



# Getting the bigger picture

## Getting the bigger picture

### Definition: Digital realities <sup>7</sup>

**Augmented reality (AR):** overlays digitally created content into the user's real-world environment. Features include transparent optics and a viewable environment in which users are aware of their surroundings and themselves.

**Virtual reality (VR):** creates a fully rendered environment that replaces the user's real-world environment. Features body- and motion-tracking capabilities.

Originally used as a social tool, businesses are starting to recognise the potential of AR/VR and immersive technologies to transform not just customer service, but also the world of work. Almost a third of executives we surveyed state they will invest in AR/VR by 2020. However, 39 per cent do not know if they will invest at all.

The foray of retailers and marketers into AR/VR has been well-documented. Consumers expect personalised shopping experiences and have benefitted from a rise in augmented reality apps. Shopping apps, for example, allow customers to view how furniture and white goods will look and fit in their own homes.

By 2020 half of our survey respondents expect to have invested in AR/VR.

In the workplace, the potential for AR/VR lies in its ability to connect with other technologies, such as the Internet of Things (IoT) and data analytics. Data has become a critical business asset and the availability of a wider set of data sources presents significant opportunities and challenges for organisations. The modern worker is often asked to access, aggregate, analyse and then act upon huge quantities of information. To do this without being overwhelmed workers need new tools and new ways to interact with data and to undertake tasks.

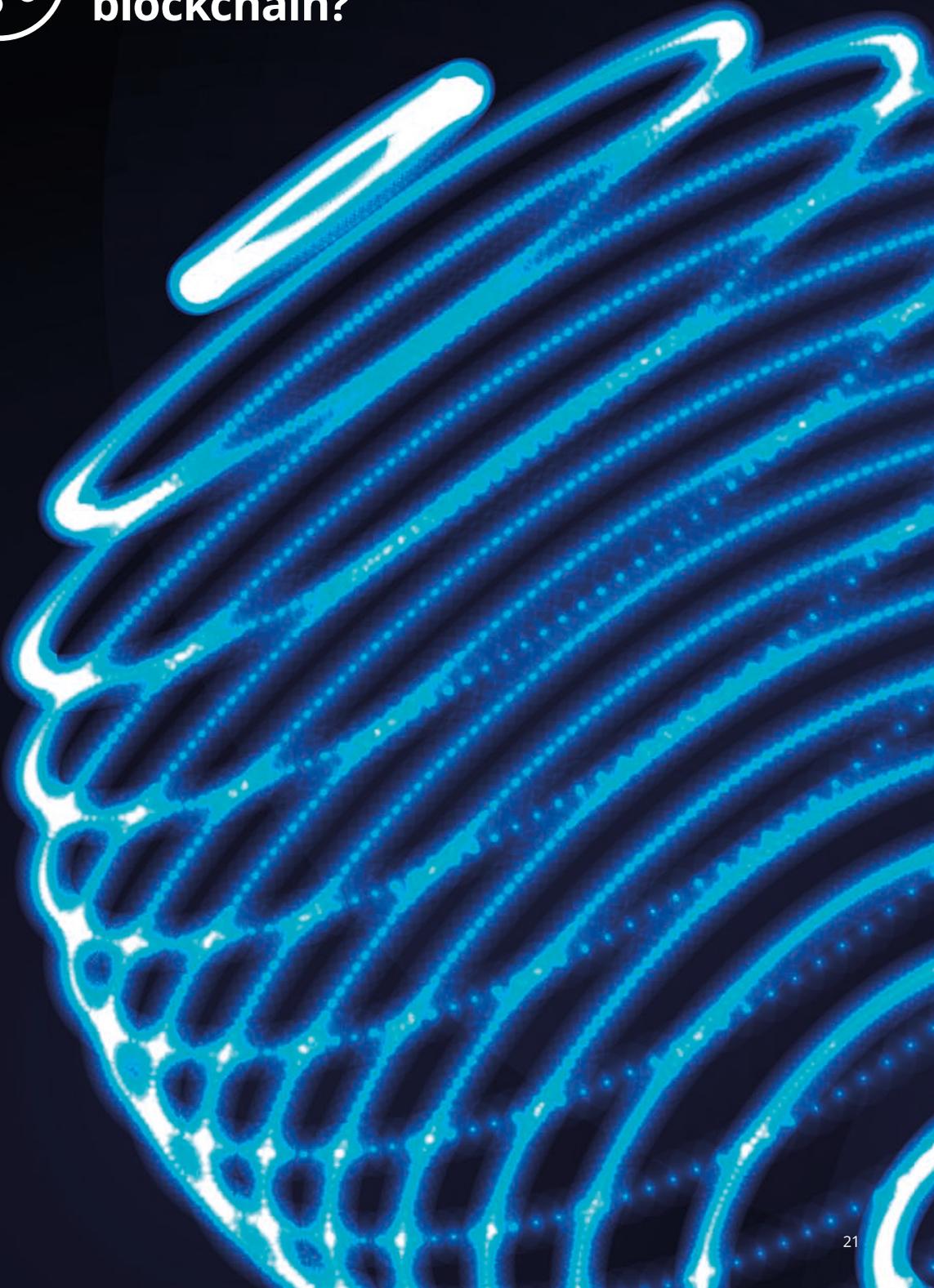
AR/VR, which marries up digital and physical information, provides opportunities to review and use information in new ways. It allows workers to interact with information via gestures and glances rather than via screens and hardware. Its application for demonstrating and training shows particular promise. For example, a remote engineer can use smart glasses alongside data from IoT to determine which part of a system is not working and receive customised repair instructions based on the machine's service and performance history.<sup>8</sup>

Deloitte predicts that use cases for AR/VR in the workplace are likely to receive significant investment in the next 18-24 months, transforming the way we work and enabling collaboration regardless of location.<sup>9</sup>





## Just around the blockchain?



## Just around the blockchain?

Blockchain is one of the most talked about and yet least understood technologies. Currently 17 per cent of executives indicate that they have invested in blockchain, predominantly led by early adopters in the financial services sector. A further 40 per cent of executives expect to invest by 2020. Yet 40 per cent do not know if they will invest at all.

Deloitte believes that blockchain has the potential to move from a fringe technology to a standard operational technology across the financial, manufacturing and consumer industries.<sup>5</sup> Over the next five years a shift is expected from prototyping towards production, with leading organisations exploring multiple concurrent use cases of increasing scope, scale and complexity.<sup>6</sup>

Organisations face a range of challenges in deploying blockchain solutions at scale. With the proliferation of platforms and protocols in the marketplace, no single solution has emerged as a clear winner. As a result there are currently no technical standards to ensure consistency and compatibility.

Deloitte's *Tech Trends 2018* suggests three approaches to help blockchain adoption:

01. Focus blockchain development resources on use cases with a clear path to commercialisation
02. Push for standardisation in technology, business processes and talent skillsets
03. Work to integrate and coordinate multiple blockchains within a value chain

### Case study: Banking with blockchain

Deloitte recently developed a Smart Identity platform. Smart ID is a universal 'digital profile' powered by blockchain technology. It allows users to create and control all aspects of their online identity within a structured and accessible environment. Those with a Smart ID will have a certified digital account containing all the information and credentials they need for trusted digital interaction.

Along with SETL – an initiative to deploy a multi-asset, multi-currency institutional payment and settlements infrastructure based on blockchain technology – Deloitte approached Metro Bank to create a pilot for contactless payment cards.

Deloitte produced a card for a group of 100 people each loaded with a small amount of money. The group – who had each set up their Smart ID – were asked to test the card by performing a series of simple retail transactions (such as buying snacks) in a controlled but live environment. The payments were processed and settled almost instantly, with both the customer and the merchant's bank balances being updated in real time. This gave both parties great clarity: the customer could keep an eye on their finances, and the merchant could use the revenue instantly if they wanted to – all while avoiding traditional payment processor fees.

Forty per cent of executives expect to start to invest in blockchain by 2020.



# Nothing artificial about investment in AI

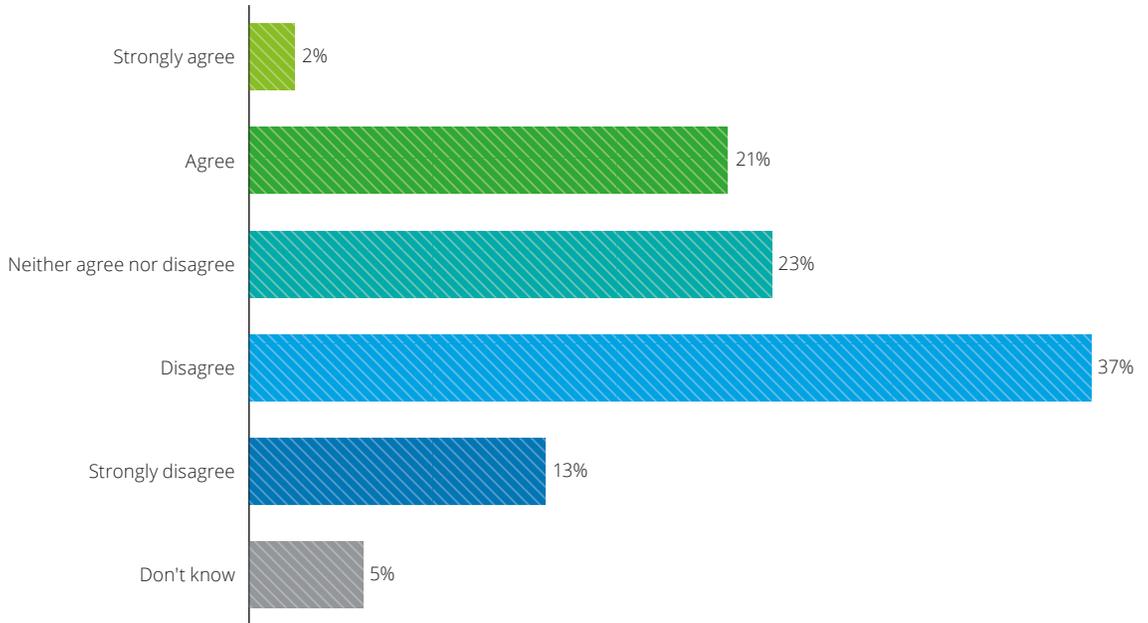
# Nothing artificial about investment in AI

AI has seen significant growth since our 2017 survey, when just 22 per cent of executives indicated that they had invested. This year, 41 per cent of organisations surveyed have already invested in AI and a further 42 per cent intend to invest by 2020. It is clear that AI is already having an impact on many organisations with some moving beyond production pilots into large-scale application.

However, despite this investment push, just 23 per cent of executives stated that their leadership team has a clear understanding of AI and how it will impact their end-to-end enterprise. This could present a significant barrier to it maturing as a technology and also suggests a lack of preparedness among senior leadership for how AI will impact their workforce.

**Definition: Artificial intelligence**  
Extends what humans can do on their own because of the complexity of the task or data, the speed to insight needed, or because traditional approaches are inefficient. It employs technology and algorithms to extract concepts and relationships from data automatically, understand their meaning, learn independently from data patterns and prior experience, and, crucially, interact with humans in a natural way.

**Figure 7. My organisation's leadership team has a clear understanding of AI and how it will impact our end-tend enterprise**



Source: Deloitte analysis n=87

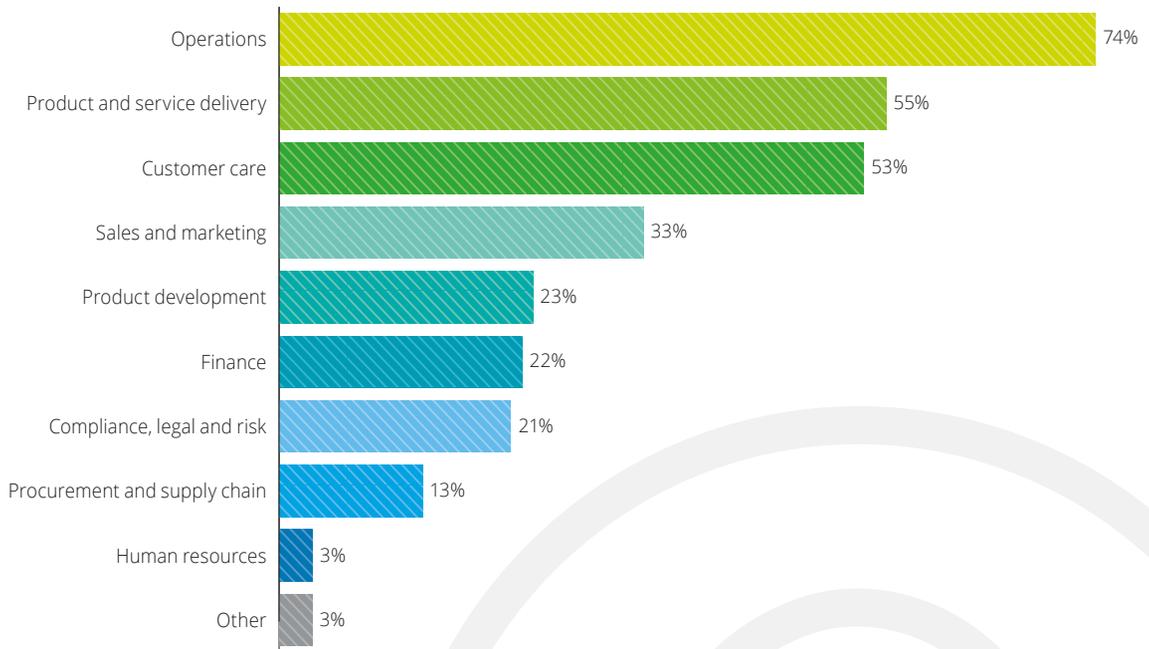
This year, 41 per cent of organisations surveyed have already invested in AI.

Understanding how to obtain the maximum benefit from AI requires careful analysis of an organisation's processes, its data, its talent model and its market. Use of cognitive technologies is not viable everywhere, nor is it valuable everywhere. However, in some areas it will become vital and a must have investment for businesses.<sup>10</sup>

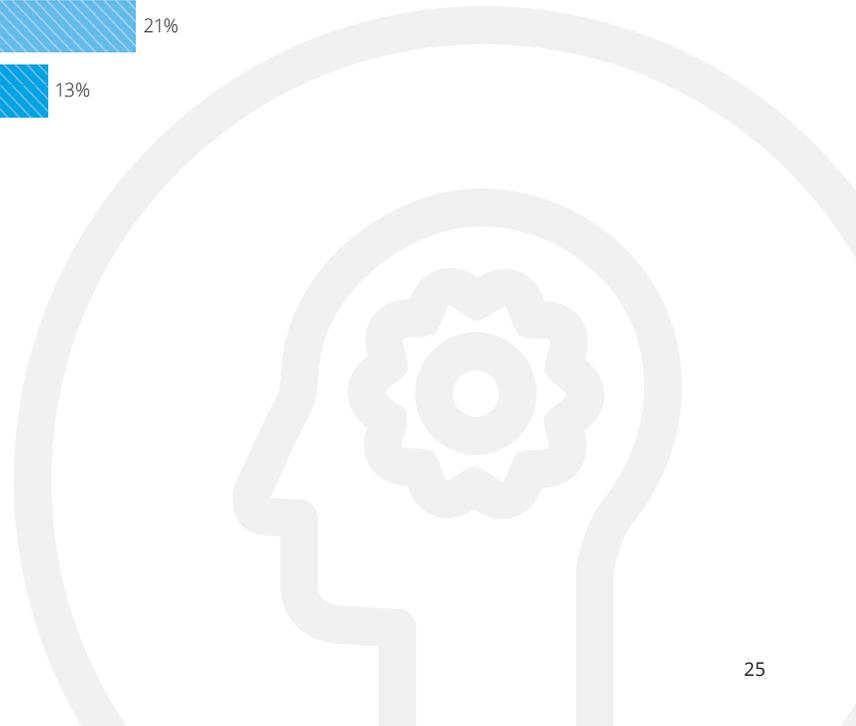
Almost three-quarters of executives surveyed have prioritised operations as the key functional area for AI investment, reflecting drives for increased productivity. Product or service delivery and customer care were also flagged by 55 per cent and 53 per cent respectively.

Only 23 per cent of executives believe their leadership team has a clear understanding of AI.

**Figure 8. Functional areas prioritised for AI investment (top three ranked)**



Source: Deloitte analysis n=87



Forty per cent of executives ranked replacing simple rules-based tasks as where they expect AI to have the greatest impact on the day-to-day activities of their organisations. Few currently expect AI to lead to the creation of new roles, whether they be focused on technical skills or complex problem-solving skills.

As AI and data-driven technologies mature, leading organisations must strive to ‘keep humans in the loop’ – rethinking work architecture, retraining people, and rearranging the organisation to leverage technology to transform business. The broader aim is not to eliminate routine tasks and cut costs, but to create value for customers and meaningful work for people.<sup>11</sup>

Deloitte's view is that human and machine intelligence complement each other and that AI should not simply be seen as a substitute. Humans working with AI will achieve better outcomes than AI alone. To take full advantage of AI, organisations need first to understand how the two interact rather than focusing on individual human and AI capabilities.<sup>12</sup>

As AI matures,  
organisations must  
strive to ‘keep  
humans in the loop’

# Endnotes

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# Notes

# Notes





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