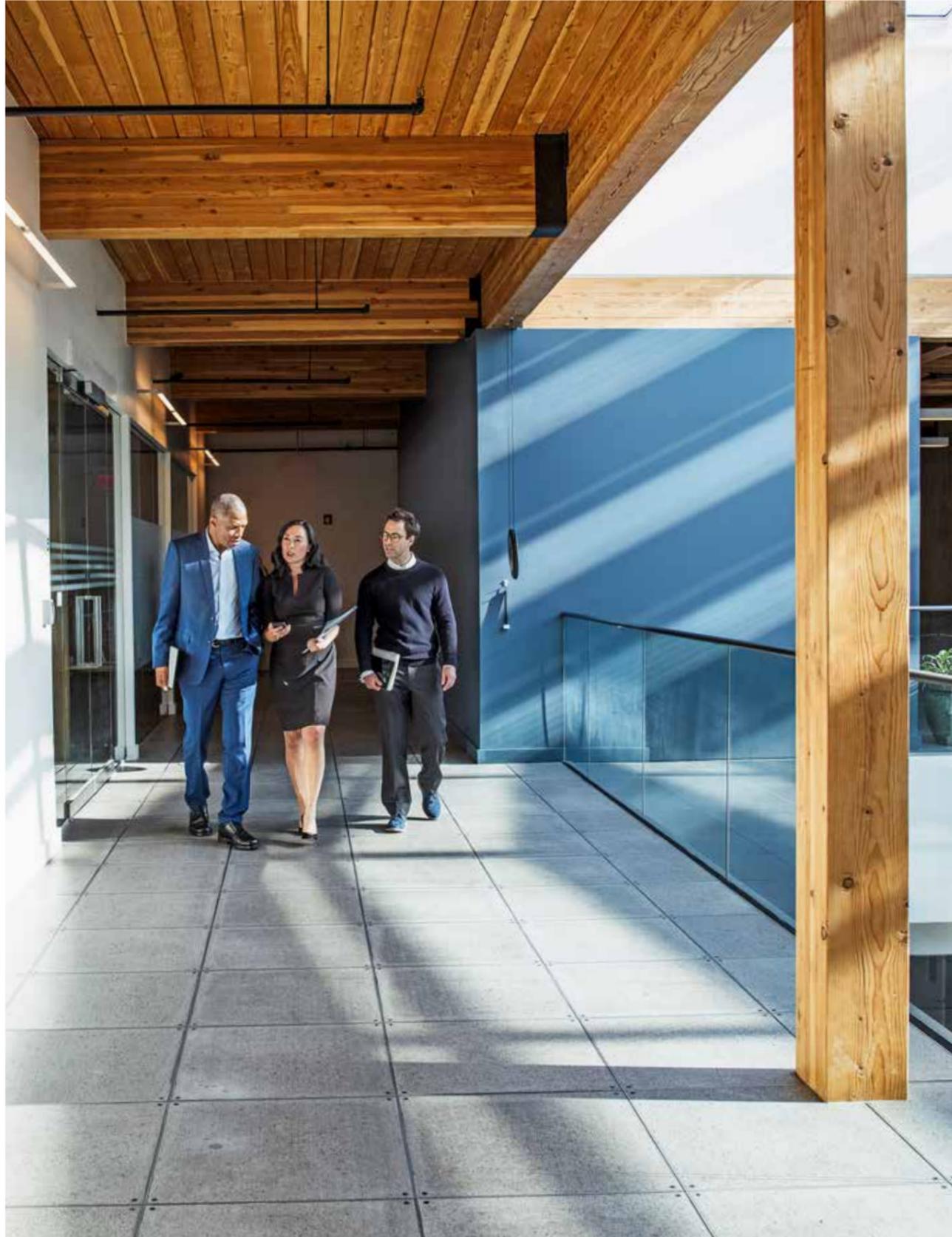




Maximising the AI opportunity

How to harness the potential of
AI effectively and ethically





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Foreword



Artificial Intelligence is becoming an ever more important part of our lives. Many of us are already familiar with its everyday applications, such as decluttering our inboxes with spam filters or receiving personalised shopping recommendations. Yet, whether it is powering a new generation of self-driving cars, guarding us against fraud or helping doctors better diagnose health conditions, AI's transformational abilities are being felt in increasingly ubiquitous and innovative ways.

Nor does the impact of AI begin and end with our everyday experiences – it is reshaping organisations and industries too. Lengthy, complex, process-driven tasks that once took hours can now be performed almost instantaneously. Vast data sets can be collected, analysed, and acted upon within minutes. Colleagues in multi-national organisations can communicate using natural language processing to translate conversations across multiple languages in real time. And customer experiences can be streamlined and digitised across a wide variety of sectors.

But amidst all this opportunity lies great responsibility. Only by applying AI in the right way can we unlock its extraordinary potential for good. Given the state of geopolitics, as well as the mercurial nature of the global economy, it is especially vital that such technology is designed, developed, and deployed in ways that are thoughtful and responsible.

Fortunately, the UK has long prided itself on ethically grounded innovation. Historically, from Ada Lovelace to Alan Turing, this nation has produced some of the world's most progressive scientists

and thinkers. Fast forward to today and we remain home to an internationally-renowned academic research sector, as well as some of the planet's most innovative companies. Add to that the Government's recent commitment to invest nearly £1 billion as part of its AI Sector Deal, and the UK is perfectly placed to become a global leader in AI.

But success tomorrow requires action today. Our research reveals that two in five of the UK's business leaders believe their current business model will cease to exist in five years' time. Yet fewer than half of the UK organisations we spoke to have an AI strategy in place.

Any organisation still unconvinced about the need to change and translate that awareness into action need look no further than one of the headline findings of this report. Namely, organisations who are investing in AI are already significantly outperforming those who are not. Meanwhile, organisations that are backing up technological investment with clear ethical guidelines and commitments around their use of AI are performing better still.

But successful AI-led digital transformation requires us to look beyond the technology itself – another key theme of this report. At Microsoft, we talk about putting people at the heart of our technology and it is our firm belief that adopting this human-centric approach can help organisations of all shapes, sizes, and sectors use AI to positively impact their business, employees, and customers alike.

Often, a good place to start the journey towards unlocking the power of AI is with asking questions. Questions like what



Cindy Rose

CEO, Microsoft UK

are the business problems we want to solve – and how can AI help? What are the opportunities we are missing? Is our data ready? Are our people ready? And, if not, how can we re-skill and re-train them so that technology augments their role rather than simply automates it?

This last point is especially important. Indeed, we uncover a growing gap between the number of employees calling for support in developing the skills to work with AI and the number of organisations actually providing it.

Throughout the pages that follow, you will find practical guidance from various industry experts to help you begin, or indeed continue, your organisation's own AI journey – from building an AI plan and preparing staff, to selecting and implementing the right solutions for you. You can also contact us or one of our partners for further assistance.

At Microsoft, our mission is to empower every person and every organisation on the planet to achieve more. In the case of AI, that means helping UK organisations harness its potential both successfully and responsibly. Wherever you are along that path, we hope you find this report valuable in guiding the way ahead.



Cindy Rose

CEO, Microsoft UK

Executive summary



In 2017, our report 'Creating A Culture of Digital Transformation' provided unprecedented insight into the challenges and opportunities facing UK organisations as they seek to evolve in line with rapidly advancing digital technologies. From adopting an agile mindset to embracing fear of change, we explored what it takes to create a true culture of digital transformation in the modern workplace.

With the findings of that report in mind, this year we take an in-depth look at one of the key technologies powering that transformation: Artificial Intelligence (AI), which we define as a set of technologies that enable computers to perceive, learn, reason, and assist in decision-making to solve problems in ways that are similar to humans.

In particular, we ask what the proliferation and acceleration of AI means for

organisations across a variety of sectors, and how they can use it to optimise operations, engage customers, transform products, and empower employees in a way that is both effective and responsible.

Before embarking on the study, we conducted an extensive literature review, drawing upon a wide range of respected research, behavioural models, and reports. These included Microsoft's 'The Future Computed: Artificial Intelligence and its role in society', The House of Lords' April 2018 report 'AI in the UK: ready, willing and able?', and the 2017 PWC report 'The economic impact of artificial intelligence on the UK economy'.

From there, we were able to develop our own conceptual model detailing the five key dimensions of the AI Opportunity: technology; people; culture; ethics;

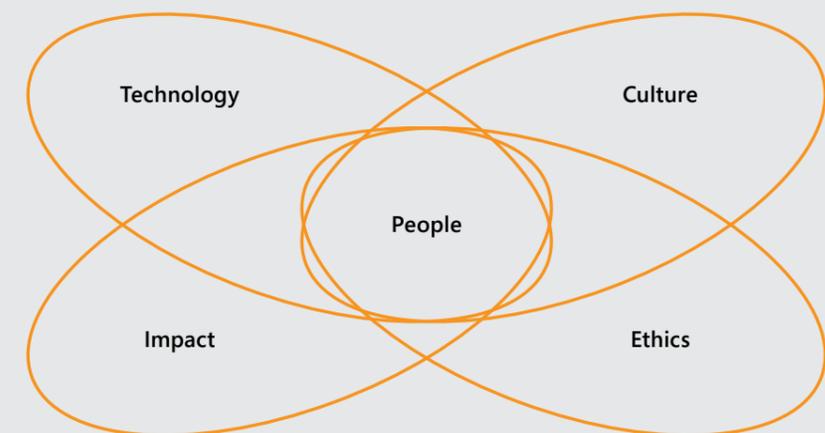
and impact. (See Figure 1). These five dimensions are interconnected and must be addressed symbiotically by any organisation hoping to develop the right AI strategy for itself and its stakeholders.

The dimensions also provide the framework for this report. Through a combination of interviews with industry experts across the worlds of business, academia, and government, along with an extensive barometer survey of 1,002 leaders and 4,020 employees, we use them as a lens through which to examine how successfully UK organisations are integrating AI into their working practices. Or, to put it in a wider context of organisational change, their readiness to take the next step on their own digital transformation journey. (See Figure 2).

Figure 1.

The five dimensions of the AI opportunity

Within our model of the AI opportunity, each of the five dimensions work symbiotically, with people placed at the centre.



Within the key findings, we hear that the UK's mix of thriving start-up culture, renowned academic research capabilities, and innovative mindset gives it a real and exciting opportunity to lead the way in the development and use of AI. Positively, we also uncover a clear willingness among leaders and employees to embrace AI technologies in their working lives.

Yet we also reveal a gap between attitude and action. Around half of employees and leaders (51% and 49% respectively) say they are not currently using any AI technologies at work. More than a third (37%) of leaders admit they are not focused on AI at all.

In this report, we provide compelling evidence – both empirical and anecdotal

– to support the need for organisations to change that. To act now to capitalise upon AI's advancing capabilities or risk being left behind.

We also provide a series of practical advice and resources to guide organisations along the path ahead - from augmenting the roles of human employees, to establishing an ethical framework for how the technology is developed and used.

Above all, we make the case for a process of evolution, not revolution. Indeed, as with any aspect of digital transformation, we argue that embracing the use of AI technologies must be seen as a collective process of continuous learning and improvement. One that should be approached with transparency, excitement,

and healthy scepticism, and guided not just by organisational concerns but by social ones too.

Only then can the UK fulfil its potential to be a world leader in AI. And only then can organisations of all shapes, sizes, and sectors build an AI strategy that delivers the right outcomes – for both themselves and the employees, customers, and societies they serve.

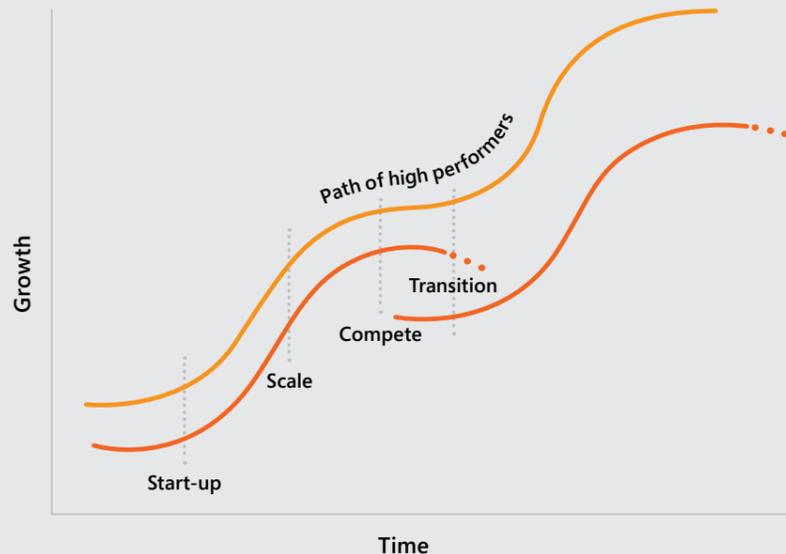
The five dimensions of the AI opportunity

We identified five dimensions through which to assess the AI opportunity for UK organisations:

- 1. Technology** – AI has an unprecedented impact on the evolving world of business. Technical knowledge of AI capabilities – now and in the near future – allows organisations to begin to harness its potential.
- 2. People** – Both the nature and quality of human work will transform, creating a new set of desired skills, new ways of learning, and requiring personal mindset shifts to resilience and agility.
- 3. Culture** – AI requires socioeconomic, cultural, and organisational change. Relationships between workers and organisations are shifting, giving way to a culture of educating, training, and retraining the current and future workforce.
- 4. Ethics** – Radical socioeconomic and cultural changes are expected to follow the transition to an AI-driven society, and a close ethical evaluation must occur to build fair AI platforms for a healthy future.
- 5. Impact** – Organisations are under increasing pressure to assess and maintain their global citizenship and environmental stewardship, necessitated by the sheer scale by which AI can potentially affect societies and the world as a whole.

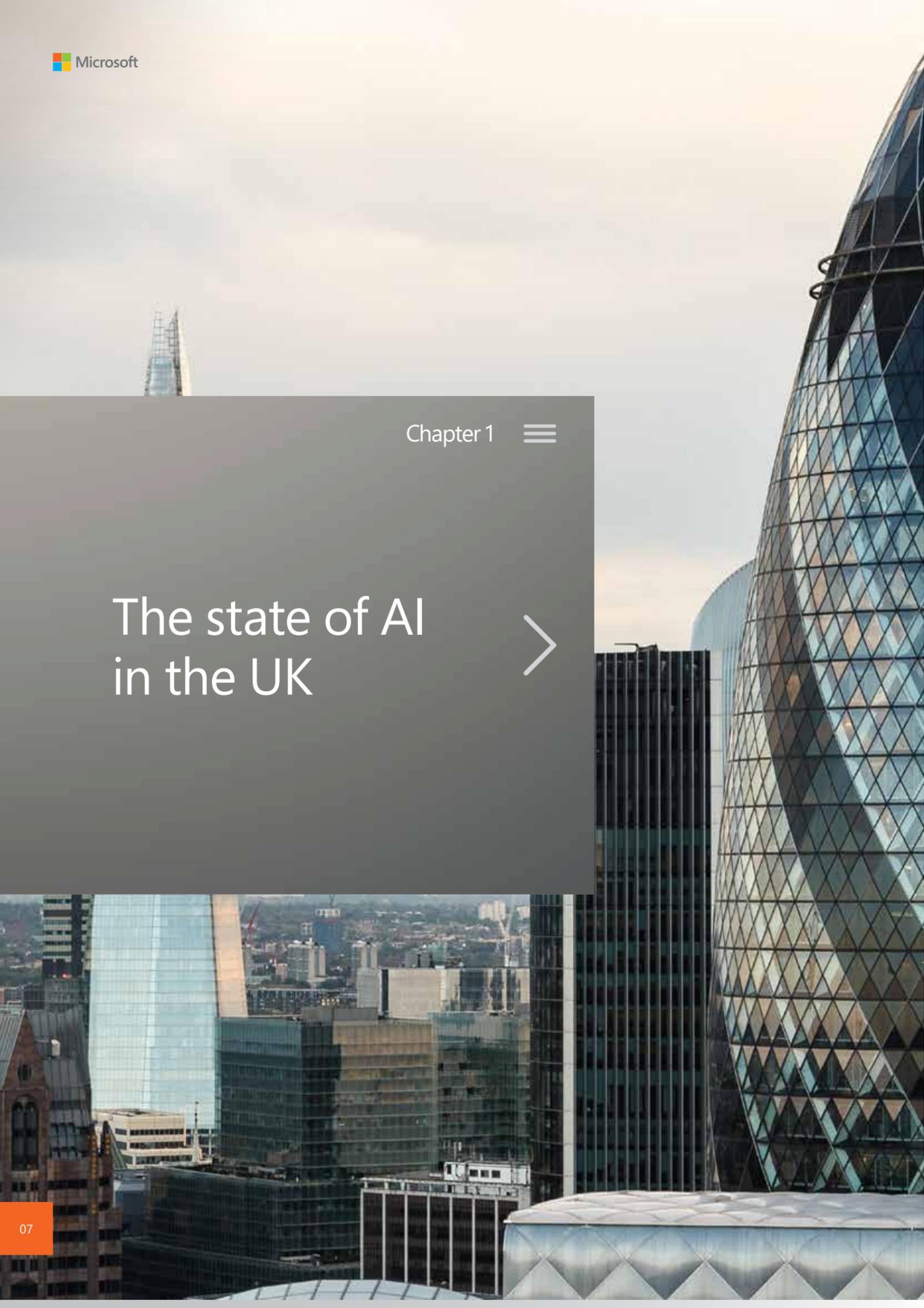
Figure 2. S-curve model

The S-curve shows how organisations can avoid any potential slow-down during their digital transformation journey by focusing on the next step before the previous one is complete. The danger is when the mid-section plateaus and change decelerates. Using AI, organisations can rapidly accelerate their own mid-section of the S-curve. Those that don't adopt it will likely experience a plateau.



“Without doubt, artificial intelligence can provide a great opportunity for British society and the economy. Today the UK enjoys a position of AI innovation, so as we enter a crucial stage in its development and adoption, the country has a clear opportunity to be a world leader. For this, an ethics-backed partnership between business, academia and government will be pivotal.”

– Lord Clement-Jones, Chairman, House of Lords Select Committee on Artificial Intelligence



The state of AI in the UK



AI is here. Whether that fills you with excitement, unease, or a combination of the two, there can be no denying that a new era of intelligent computing has begun – and is set to transform many aspects of our personal and professional lives.

It's already happening. From digital personal assistants, such as Cortana and Alexa, to the algorithms that allow the likes of eBay and ASOS to make suggestions based on our previous behaviour, AI is the emerging power behind daily life in the UK. Meanwhile, applications such as chatbots and robotic processing automation (RPA) are also having a significant impact on operating practices in workplaces across both the public and private sectors.

As Microsoft's Chief Technology Officer, Enterprise, Norm Judah explains: "AI is about augmenting human ingenuity. Whether you're a seller, a marketer, a lawyer or something else, AI will change the way you make decisions. It can help you navigate vast amounts of data and give you advice and recommendations about how to proceed. What you do with that advice is up to you."

For UK organisations, perhaps one of the most compelling reasons to embrace AI is the business case. Microsoft's research shows that organisations already on the AI journey are outperforming other organisations by 5% on factors like productivity, performance, and business outcomes. It also reveals that organisations investing in establishing the right approach to AI technology now – specifically, by developing underlying values, ethics, and processes – outperform those that are not by 9%. Given the speed at which AI is developing, this gap is almost certain to widen in the coming years.

But while AI's growing presence in the UK is irrefutable, where does the country lie on its journey to integrating it into our everyday lives and, in particular, our work?

In 2017, we asked the nation's business leaders if they felt their current business model would cease to exist within the next five years. 38% said 'yes'. Checked again for this year's report, that figure has increased slightly to 41%. Although by no means a significant rise when viewed in isolation, that's two-fifths of organisations who realise they are operating on borrowed time unless they evolve. Add to that the backdrop of rapidly advancing technology, something AI will only serve to accelerate, and the urgent need for action is clear.

Organisations that are investing in establishing the right approach to AI now outperform those that don't by 9%.

The good news, then, is that 67% of leaders and 59% of employees say they are open to experimenting with AI to do new things at work. 39% of leaders surveyed see its potential to streamline bureaucracy, while more than a quarter (27%) believe it will lead to the creation of new jobs and industries.

In other words, there is a willingness within the UK workforce to embrace the possibilities of AI while evolving their job roles and operating practices. This is in noticeable contrast to the doomsday headlines and sensationalist media reports about fears of intelligent robots usurping human workers across the board.

Yet willingness, of course, is just one part of the story. Ambition is not the same as adoption. For positive transformation

to truly take place, every organisation requires a clear roadmap for change. A roadmap that gives its people the tools and training to understand how, when, and why to incorporate AI into their jobs. That encourages leaders and employees to think deeply about the ethical implications of merging human and machine. And that promotes a culture in which workers feel empowered to experiment with new approaches, fail fast, refine, and try again.

As we see in Figure 3 on page 9, it is here where the greatest progress is required. Of the UK leaders we spoke to, half (51%) say their organisation does not have an AI strategy in place. Meanwhile, 51% of employees and 49% of leaders admit they are not currently using any form of AI to perform tasks at work.

The result is large numbers of organisations that are either failing to harness AI in any capacity, or are simply not aware they are using it already. Both represent a recipe for missed opportunity, something brought into even sharper focus by the fact that more than a third (37%) of the leaders we surveyed say their organisation is not thinking about AI at the moment.

Yet amidst the inevitable challenges and disruption, the key word here is 'opportunity'. As Lord Clement-Jones, Chairman of the House of Lords Select Committee responsible for publishing the 'AI in the UK: ready, willing and able?' report earlier this year, puts it: "The UK has a clear opportunity to be a world leader in AI development."

A recent report from PWC paints a similarly optimistic picture, forecasting that AI could help the UK economy grow substantially across all regions – with GDP up to 10.3% higher and spending power increasing by between £1,800 and £2,300 per household.

As for the exact nature of the opportunity AI presents for UK organisations, we have identified three key themes that we believe, based on our own research and the views of our customers and industry experts, should provide the guiderails for the journey ahead:

- 1. Embrace AI's potential or risk being left behind**
How organisations can get their AI journey started and future-proof their success.
- 2. It's not what AI can do but what it should do**
How organisations can take an ethical approach that ensures AI has a positive impact from a social perspective as well as an economic one.
- 3. Developing tomorrow's skills, today**
How organisations can equip employees to use AI to augment their roles and do more meaningful work.

Put another way, we ask how organisations can ensure they are taking the right approach to AI. One that unlocks the power of the technology to generate and expedite growth. That prevents over-analysis and a fear of 'what if?' – both of which can paralyse progress before it begins. And that helps employees at all levels develop the skills to thrive in an augmented workplace.

Perhaps most critically of all, we consider the importance of establishing a clear code of ethics, commitments, and values when it comes to AI's development and use. Why? Because only then can we build trust in the technology (both inside and outside the workplace), allay concerns about data security, and ensure that the positive impact of AI is felt as keenly from a social perspective as it is from an economic one. Not just now, but for generations to come.

“The UK contains leading AI companies, a dynamic academic research culture, and a vigorous start-up ecosystem. We have a clear opportunity to be a world leader in AI development.”

– Lord Clement-Jones, Chairman, House of Lords Select Committee on Artificial Intelligence

Figure 3. **Ready, willing...and able?**

Employees and business leaders who do not currently use AI in tasks at work are open to experimenting with AI, but they have no clear strategy for doing so.



AI uncovered

AI research began in the 1950s based on work by British mathematician Alan Turing during World War II. Fast forward to today and the last 10 years have seen rapid advances thanks to the confluence of three critical factors:

1. Ubiquitous cloud computing
2. Vast amounts of data
3. Breakthroughs in machine learning algorithms

Microsoft Chief Technology Officer, Enterprise, Norm Judah, explains what exactly AI is and why it is so important.



What is AI?

Broadly speaking, AI refers to a set of technologies that enable computers to perceive, learn, reason, and assist in decision-making to solve problems in ways that are similar to humans. That can be in everyday ways like journey recommendations from Transport for London (TfL), right through to more complex applications, such as self-driving cars, or the use of natural language processing to let employees communicate across languages and borders.

Of AI's various fields of study, the most notable is machine learning. This enables computers to learn without being explicitly programmed. Instead they use algorithms – lines of code – to spot patterns in data and then behave in a predictive way.

Can you give us some examples?

Speech recognition, natural language recognition, search recommendations, and email filtering are all examples of AI that uses machine learning. So, when your Focused Inbox in Outlook sorts the most important emails from the rest, it uses AI. Similarly, when you search or shop online, the suggested results are the work of AI. We also see it being used regularly in industries like manufacturing and it fuels exploration to enhance factors like performance, precision, and productivity.

What about the more advanced AI applications you mentioned?

It is advances in the field of deep learning that have led to the recent explosion in AI. Deep learning is a type of machine learning that is inspired by how neural networks in the human brain process information. In these systems, each layer in the neural network transforms the data it receives into a slightly more composite representation of that information.

In this way, the system reaches a highly detailed understanding of the data that amounts to a form of intelligent reasoning. So, in 'seeing' a picture of an object, the machine will first detect a shape from a matrix of pixels, then it might identify the edges of that shape, then contours, then the object itself, and so on, until it identifies the image.

Many medical start-ups are already using this technology to enable computers to read large numbers of X-rays, MRIs, and CT scans more rapidly than a radiologist. Then they flag up any anomalies to human reviewers. Similarly, in the financial sector, AI is changing the game for fraud detection. Analysing past spending patterns, the technology can identify and alert banks to unusual activity in real time. This means crimes like the fraudulent use of a card in one country, just hours after being used elsewhere, are stopped before they happen, not caught afterwards.

These examples are numerous – and growing. Indeed, what's clear is that, across sectors and geographies, the potential of this technology to improve the speed and accuracy of vital processes and tasks is considerable.

Is AI a cause for excitement or concern?

Despite what some science fiction films might have us believe, AI isn't about to take over the world. In fact, today's AI systems are only capable of carrying out a single and specific task – having first been designed by a human. Nor are they capable of intuition, empathy, or emotional intelligence.

Of course, AI will have implications for how we work. It is likely that certain roles and tasks will look very different in 10, or even five, years' time. Some will disappear but then, equally, others that don't exist now will spring up in their place. Really, this is a process of evolution. With the right training and support, most jobs will be augmented and improved by AI, rather than replaced by it.

How can the UK build trust in the benefits of AI?

Building public trust in AI technology needs to begin at the design stage. Products should be created within a strong ethical framework with human values at the centre. Data privacy, the malicious misuse of AI, the moral status of AI systems, and where responsibility lies when things go wrong are key issues. Crucially, AI should not be the provenance of any one company, government or nation to develop unchecked. It should be shaped by and open to everyone.

Embrace AI's potential or risk being left behind

Technology, people, impact



If you're on the bus, you can't miss it. Sounds obvious, right? Yet when applied to the adoption of AI, it seems that many organisations remain hesitant to board.

In most cases, this is not down to a lack of awareness. Nor is it due to a lack of belief in the fact that AI could help their organisation function better. As we saw in the previous chapter, both leaders and employees alike recognise, and are open to, the possibilities AI offers. (See Figure 4).

So what's stopping them getting started? Perhaps unsurprisingly, it comes down to a number of interwoven factors.

The cost factor

One of these is cost. Of the leaders we spoke to, just 39% say they understand the development costs associated with AI. That means nearly two-thirds are operating in the dark when it comes to the potential return on investment. And in that situation, the default position tends to be to associate AI with prohibitive or unjustifiable expense.

As Terry Walby, CEO of robotic process automation platform, Thoughtonomy, points out: "Making AI accessible and simple to deploy through intelligent automation is a priority. We meet many executives who have struggled to incorporate AI capabilities into their

operations because they saw it as too complex and too expensive."

Yet the truth is rather different. Our research shows that organisations already on the AI journey are delivering a 5% improvement on factors like productivity, performance, and business outcomes compared to organisations that are not. Whatever sector you're operating in, that's a powerful business case.

"Beware analysis paralysis to doing better things. Take your risks and expect failures. Seize your opportunities."

– Pete Trainor, Co-Founder, Us AI

Besides, as Michael Wignall, CTO, Microsoft UK, points out: "We're just at the beginning of the AI journey. That 5% performance boost will start to accelerate, quickly."

Identifying the problem

Also at play here is what Us AI Co-Founder, Pete Trainor, calls "analysis paralysis". This is

when organisations find themselves caught in a perennial cycle of discussion where leaders happily consider the potential that new technologies offer, but never quite get to a point at which they are willing to bite the bullet and adopt them.

So, while many organisations claim to have an AI strategy, the reality is they are still working on it. Or, to return to our original analogy: they are still at the bus stop waiting to get on.

Again, though, this is not a case of them failing to understand that AI could help improve working practices. It's about not knowing how it will help and, therefore, which solution to opt for. As with so many other business issues, overcoming this sense of inertia comes down to first identifying the business problem that needs to be solved.

Is it, for example, the need to increase efficiency in administrative tasks, such as payroll and invoicing? If so, a Robotic Process Automation (RPA) solution could be the answer. Is it about improving the customer experience with a chatbot or automated telephone system? Is it the need to free up employees' time for creative tasks by using machine learning to handle the more mundane or straightforward parts of their job? Is it all of the above and more?

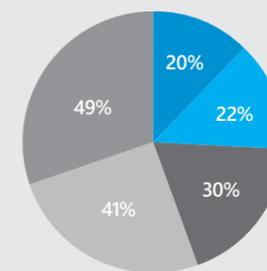
Figure 4.

The impact of AI on life in UK society over the next 5 years

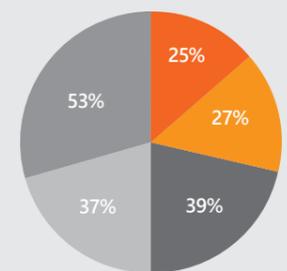
AI will:

- Absolve people of responsibilities
- Generally make British families worse off
- Enable more creativity in businesses
- Help create new jobs and industries
- Streamline bureaucracy/ admin tasks, leaving room for more front-line workers
- Mean older generations of workers will get left behind
- Raise more concerns about privacy and security

Employees



Business leaders



Whatever the answer, the key is to make the problem the starting point – not the AI. This can prevent organisations investing valuable resources in setting off down the wrong track or processing a whole heap of irrelevant data. It can also mitigate the danger of being caught in endless hypothetical conversations about whether AI is worth the risk.

“When we use AI in a project, it’s not because we are trying to find a solution that uses AI,” explains Miguel Alvarez, Director of Technology Services at digital creative agency, AnalogFolk. “It is because we have determined it is the best solution for the problem at hand.”

Getting your data in order

Similar to the need for organisations to first identify the actual business problem that needs solving, it is also vital they get their data house in order before embarking on any serious process of AI-based transformation.

After all, neither AI cognition nor perception would be possible without qualitative and quantitative data. Fortunately, for most organisations, the advent of cloud computing has made capturing, storing, and accessing it easier than ever before.

We found that more than a third (34%) of UK leaders say their organisation is already using tools like predictive data analytics and data integration. This is comfortably higher than any other AI technology – second is automation at 22% - and represents a great platform from which to build.

But having the data, and even analysing it, is not the same as using it properly. As we explore in more detail in Chapter 3, ensuring data is clean, unbiased, and accurate is a crucial starting point for every organisation’s AI journey, whether the end goal is transforming customer experiences, reshaping products or something else.

“Great AI needs great data. But if you start by asking ‘what data have we got?’, you are predisposed to the solution. Much better to start at the business problem, then see if you have the right data to tackle it.”

– Norm Judah, Microsoft Chief Technology Officer, Enterprise

Here it comes back to starting with the problem – not the data. Rather than saying “we’ve got all this data, what can we do with it?”, organisations will be better served by looking at what they want to achieve, then identifying AI solutions that will help them collect and harness the data required to do it.

The importance of healthy scepticism

As we discovered in our 2017 report ‘Creating a Culture of Digital Transformation’, mindset has as much of a role to play here in harnessing AI’s potential as the technology itself. Just as with any new way of working, successfully building AI into an organisation’s operating practices requires both leaders and employees to adopt a culture of continuous learning in which new solutions are introduced, experimented with and shaped from the ground up as well as the top down.

As Microsoft UK’s Chief Operating Officer, Clare Barclay, puts it: “For business leaders, a great way to approach innovation is with excitement about the potential solution.”

Yet alongside the enthusiasm, there is also a place for caution. We found that the organisations introducing new AI-based solutions most successfully are those that demonstrate a healthy level of scepticism. Yes, they are optimistic about AI’s potential, but they also understand they are unlikely to get it right first time.

In this situation, adoption takes the form of ongoing, iterative improvement, powered by an open, agile culture in which staff analyse and critique the technology as they use it. This allows them to help shape its development based on real experiences, ultimately delivering better outcomes for everyone involved.

“For business leaders, a great way to approach innovation is with excitement about the potential solution.”

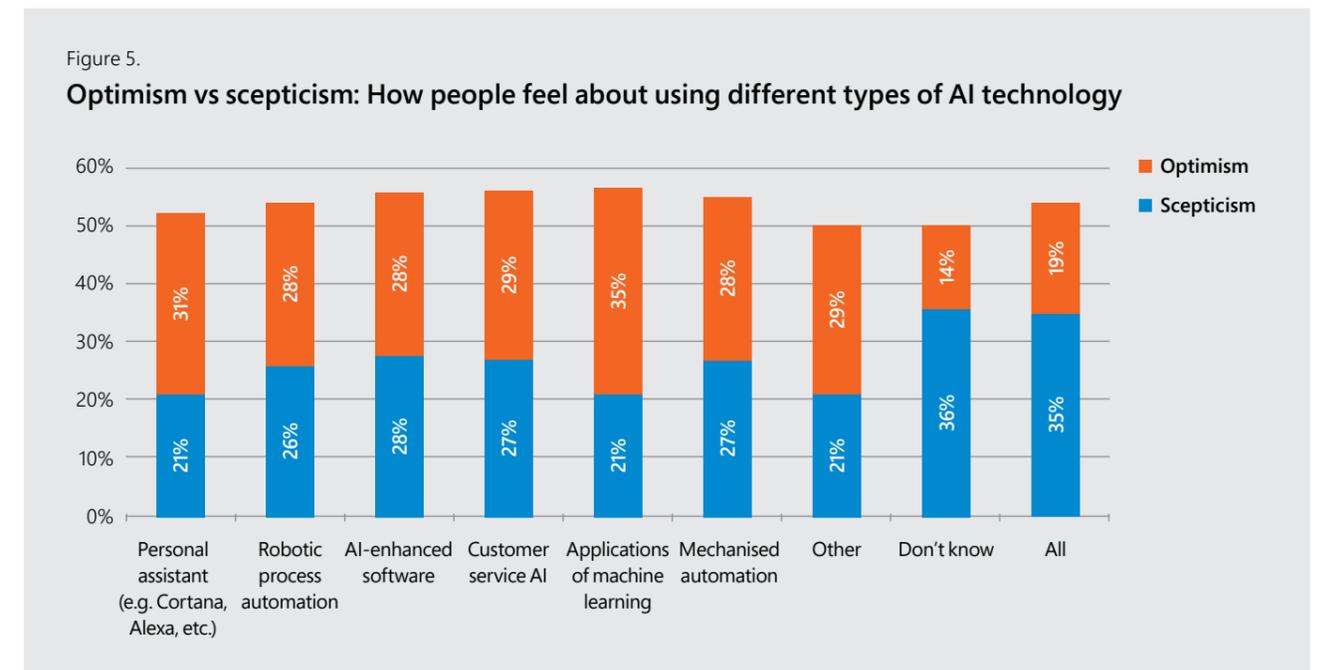
– Clare Barclay, Chief Operating Officer, Microsoft UK

Using AI to keep London moving



Every day, there are 32 million journeys made across London, and Transport for London’s (TfL) role is to keep this complex travel network moving. Data underpins the in-depth understanding of all these various journeys with TfL championing analytics to support the transport network.

Lauren Sager Weinstein, TfL’s Chief Data Officer says “My favourite picture in the office is of women in 1939, in front of a mound of paper tickets. It was just three days’ worth of travel, and I think something like four million tickets. It took six months to manually go and analyse so they could work out where people went and plan the network better. Today we process 19 million ticketing transactions each day! Over the past decade we’ve been providing analysis of this rich data source to develop our transport network and improve our operations. Now that new machine learning techniques are coming to the forefront, we are beginning to explore how we can adopt them. Looking to the future we see the potential of AI, driving change in how we deliver a better service for our customers travelling around London.”



Case study: Embracing healthy scepticism



As Newcastle City Council embarks on its AI journey, Digital Transformation Programme Manager, Jenny Nelson, explains how it aims to embrace the possibilities of AI to deliver better services for citizens.

How far are you into your AI journey?

It's early days, but what's really clear to us is that AI allows people to spend more time on the things we're good at. We need to start experimenting with it, so with that in mind, we've been holding innovation labs to explore how we can best embrace AI for the good of the council and our citizens.

One thing that has come out of the labs is the use of AI and Cognitive Service tools (such as bots) to make our customer service more user-friendly and efficient. Our WasteBot, for example, has turned the process of applying to take household waste to the tip, which could take up to two weeks, into a 90-second task. We have also developed an adult social care bot that triages incoming contact to provide people with the information they need. What is really important with these tools is that they recognise when the customer needs to be directed to a member of our staff. Human or machine, this ensures people get the support they require.

How have staff within the council responded to change?

There has been some scepticism, but there has been lots of enthusiasm too. In the beginning, we would have a conversation about what is possible, and then people would not expect it to actually come to life. Part of this comes down to picking the right kind of projects with which to experiment. Starting small and scaling up helps teams build trust, get feedback, learn lessons, and build confidence. Using these projects and acknowledging any initial scepticism has helped us adopt a growth mindset. Basically, we are creating a culture where we say to ourselves: "Why shouldn't we be able to achieve this within the council?"

And what about the people who live in the city?

I have learned you really gain the trust of citizens if you take their feedback onboard. We make it very clear when we are putting out digital innovations in beta stage. You have to have the confidence to say: "We know it's not perfect yet. Tell us what you think. Try it, use it – then we will improve it."

An open culture

Promoting this culture of iterative, collaborative development can be achieved in various ways. For example, it might come in the form of a dedicated hackathon in which a focused group of employees come together to test and shape the solution before it is rolled out more widely – an approach both Ordnance Survey and Confused.com have used to good effect. It may be by providing regular platforms for users to share their experiences and suggest improvements.

What's key is that feedback flows freely and scepticism is embraced and responded to, rather than dismissed as risk-aversion or unreceptiveness to new ways of working.

Put another way, it is possible – and, indeed, desirable – for an organisation to be positive about AI's potential as well as realistic in assessing the practical challenges associated with ensuring it makes a meaningful impact. Sceptical action is far better than no action at all.

Of course, as Centrica's Group Chief Information Officer Mike Young underlines (see case study on page 19), leaders have a major role in setting the tone – both through attitude and action. If they are seen to be enthusiastic about the differences AI could make to the organisation, demonstrate the tangible

benefits to employees, and show a willingness to incorporate it in their own day-to-day work, staff are far more likely to adopt a similar approach.

Indeed, there is a clear expectation among the employees we surveyed that their organisation's leadership must be aware of the technological opportunities available. Almost three quarters (73%) agree that leaders need to stay on top of changing technology and regulations, compared to just 7% who disagree.

Challenges also emerge when it comes to taking action. More than half (56%) of staff believe technology decisions are often made by people in their organisation who don't understand employee or customer needs. Furthermore, 29% of leaders also believe that technology decisions are driven by internal politics rather than rational analysis.

This brings us back to the need for an open culture in which employees at all levels are empowered to shape the journey as it happens rather than be presented with a final destination from on high. Digital transformation – and AI implementation especially – can and must never be a purely IT or executive led programme.

Indeed, the most important thing for any organisation seeking to embrace the potential of AI is the need to view it as a collective journey. One that unlocks AI's

possibilities for all and embeds iterative change and experimentation in the organisation's culture, rather than bolting it on via a select group of departments or levels.

That does not mean a blind acceptance of every AI solution – far from it. As we have seen, healthy scepticism is a key element of successful innovation. Nor does it mean overlooking the idiosyncratic challenges and pinch points every organisation will face along the way. As Isabel Sargent, Senior Innovation Research Scientist at Ordnance Survey, admits: "There can be frustration that we are not changing fast enough but it takes time. Besides, what we are doing as a mapping agency is taking the real world and interpreting it in a very human way. So, as much as we are automating, there has to be human interpretation every step of the way. We can't start from scratch."

Instead, it's about realising that taking no action is simply not an option. AI will continue to disrupt traditional ways of working across every industry and sector – most likely at a growing pace. The choice, therefore, is clear: board the bus and direct the journey yourself. Or watch it disappear into the distance carrying your competitors with it.

"We run regular show and tells where we bring in experts to look at how we can help them with our data. With our HR team, we looked at how we could help them in terms of talent recruitment, then unpicked how AI could work for them specifically. Our use of AI is disseminated across the group and across teams, so we've tried to illuminate its benefits and reinforce that it's here to stay."

– Mike Young, Group Chief Information Officer, Centrica

How to embrace AI's potential



Learn:

Understand how ready your organisation is to take advantage of AI by completing Microsoft's 10-minute online survey at already.microsoft.com

Here you can answer questions about your current business strategy, culture, organisation, and capabilities. Then, based on your answers, discover where you are on the AI readiness spectrum. The survey reveals steps other companies at your readiness level have taken, and offers recommendations for progressing your own AI journey.



Think:

Consider your organisation and ask yourself and key stakeholder groups, customers, employees, and business leaders three key questions about augmenting your workplace:

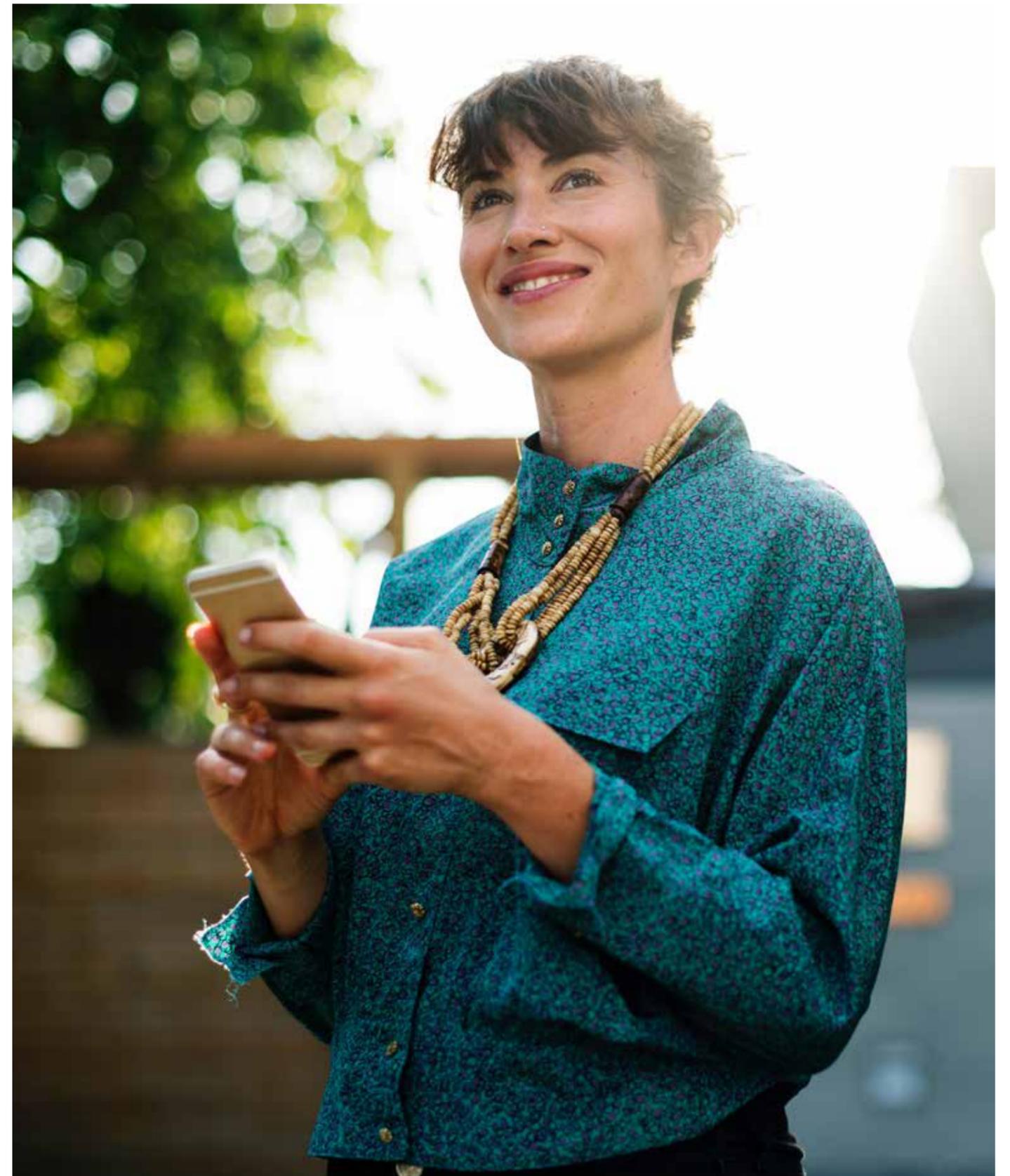
1. What's best for the customer?
2. What's best for the organisation now?
3. What's best for the organisation in the future?

Then, create a taskforce that is responsible for investigating the use cases for AI.



Do:

Take action and pilot a hackathon to align key stakeholders on a roadmap for change. Allow employees to experience AI technology first-hand, then give feedback in a 'safe' environment. For an example of how this can work in practice, visit: <https://aka.ms/ordnance-survey>



Case study: Making the most of the AI opportunity

centrica



As part of Centrica's five-year transformation programme, the British Gas owner is embracing AI to evolve its services and get the best out of the business. The company is using AI to analyse each business area's data repository to create products that work for customers and is transforming its services with natural language processing bots and Dynamics 365 tools. Here, Centrica CIO Mike Young explains why it's important to get started with AI, today.

What opportunity does AI present for Centrica?

AI presents a huge opportunity for businesses like ours. At Centrica, we are collecting vast amounts of data every day across many business groups, and AI is transforming the way we deal with this complexity. Put simply, AI helps us to make the most of our data and bring new products and services to market, ultimately enabling us to better service our customers. For us, the investment in AI capabilities is critically important. I'm confident we're going in the right direction.

What has been your key learning so far?

To get the best out of AI and the best out of your business, you must remember to start with the problem you are trying to solve. Take our call centres for example. We wanted to improve customer experience by ensuring enquiries and issues could be solved quickly. To do this, we built a natural language digital bot to work alongside operatives, providing them with the information to best support customers and feeding updates into our back-end systems. This has cut down mistakes by half and helps our operatives focus on what they are best at: great customer service.

How have you made the case for AI to employees across the business?

We have worked hard to illuminate the benefits of AI to the business and show that it is here to stay. To do this, we've tasked our data scientists to articulate the benefits of the technology in ways that everyone can understand and show groups within the business how we can help them with their data. With our HR team, for example, we ran a showcase session and helped to unpick how we can support with processes like talent recruitment. The best thing about these sessions is that we often get employees requesting follow-ups to further evaluate challenges and create fresh thinking.

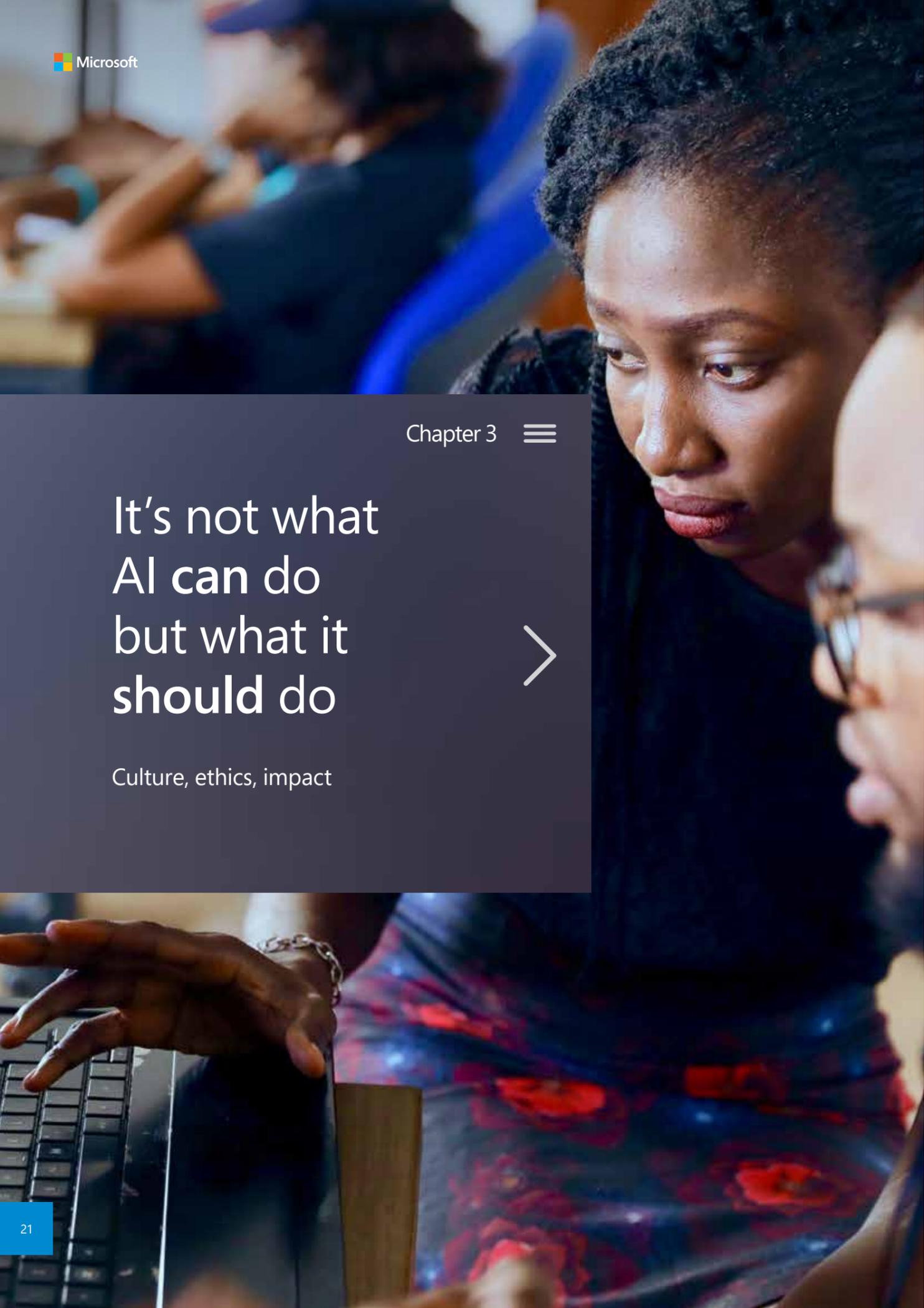
What this shows is that we have created a culture of curiosity at Centrica. One where employees understand the technology and are seeking ways to use it, rather than being forced into change.

What skills are most important when working with AI?

For me, the most important thing is having an innovative spirit and being open to new ideas. Of course, maths and science skills will be critically important to those developing AI, but at Centrica we have also made a conscious effort to bring non-technical people from around the business into our data science team. These individuals provide a real sense of the challenges within the organisation that we should be focusing on solving with AI. They act as our front door into business groups including field services and call centre operations and help direct how we use the technology.

What advice would you give to organisations looking to get started with AI?

Firstly, demystify the acronyms and start talking to experts and your network about the potential of AI. Secondly, remember that a great way to learn is by being part of the discovery process. Put business problems on the table and work with your team to see how you can solve them. And thirdly, avoid forcing change. Instead, bring employees along the journey and showcase the benefits of the technology to help them understand the opportunity.



Chapter 3 

It's not what AI can do but what it should do

Culture, ethics, impact



If the previous chapter was all about the need to embrace the potential of AI, in this one we focus on the way in which organisations go about doing it. In particular, we consider the ethical implications of building AI into day-to-day operating practices – from the impact on the human workers an organisation employs, to what it means in terms of data protection and security for its customers, suppliers, and stakeholders.

This question was also at the heart of the recent House of Lords report entitled 'AI in the UK: ready, willing and able?' The report highlights the need for "ethics to take centre stage in AI's development and use" while recommending that a cross-sector AI Code be established to govern the application of AI technologies both nationally and internationally.

Should vs can

For organisations in the public and private sectors, the duty to establish a clear set of ethics, commitments, and values around their use of AI can be summed up as they need to become a 'should' company not a 'can' company. In other words, the question leaders must ask is not what AI technologies are capable of doing, but what they should be allowed to do.

Our research found that adopting this approach early on enables organisations to better adapt to the changes AI brings about. Those that start their AI journey by agreeing clear underlying values and ethics are 28% more likely to seek to improve the world and make life better in the UK. In a world of conscious-consumerism, where shoppers

increasingly choose brands that can demonstrate a positive social impact, taking an ethical stance on AI can be a powerful reputational tool.

What's more, 'should' companies have been shown to outperform 'can' companies by 9% on average, adding weight to the business case as well as the societal one.

'Should' companies have been shown to outperform 'can' companies by 9%.

Ethical AI in the UK

In April 2018, a House of Lords Select Committee chaired by Lord Clement-Jones published a report examining the UK's ethical development and use of AI technologies. Among a number of recommendations, the report suggests the establishment of an AI code based on five key principles:

1. AI should be developed for the common good and benefit of humanity
2. AI should operate on principles of intelligibility and fairness
3. AI should not be used to diminish the data rights or privacy of individuals, families or communities
4. All citizens should have the right to be educated to enable them to flourish mentally, emotionally, and economically alongside AI
5. The autonomous power to hurt, destroy or deceive human beings should never be vested in AI

So what then, do 'should' organisations look like? Based on our findings, they are 22% more likely to have a culture of transparency between leaders and employees, and 10% more likely to prioritise diversity and inclusion. Crucially, they are 13% more likely to ensure AI is used responsibly.

Notice all these characteristics are not driven by external regulations, nor the technology's own limitations. Rather, they come from the people within an organisation's own four walls. Only they can set the parameters and guiderails by which to ensure AI is used correctly, transparently, and responsibly.

As Anca Dragan, Assistant Professor of Electrical Engineering and Computer Sciences at UC Berkeley, points out in the 'Future of Life Institute's How Do We Align Artificial Intelligence with Human Values?': "Robots are not going to try to revolt against humanity. They will just try to optimise whatever we tell them to do. We need to make sure to tell them to optimise for the world we actually want."

The human question

The good news is that UK workers seem to recognise this fact, with 85% of the leaders and 82% of the employees we spoke to believing it is up to humans to take responsibility when AI behaves in unforeseen ways.

First and foremost, when it comes to accepting this responsibility is the question of how AI impacts an organisation's existing workforce. From stories of a so-called labour market robot apocalypse to claims that as many as 800 million jobs could be lost to automation worldwide within the next 12 years, there is an understandable climate of anxiety among individuals around the growing influence of AI in the workplace.

Indeed, just 44% of employees trust their organisation to use AI responsibly, with even fewer (37%) believing it will change jobs not eliminate them. Similarly, only 47% think humans and robots can work harmoniously together.

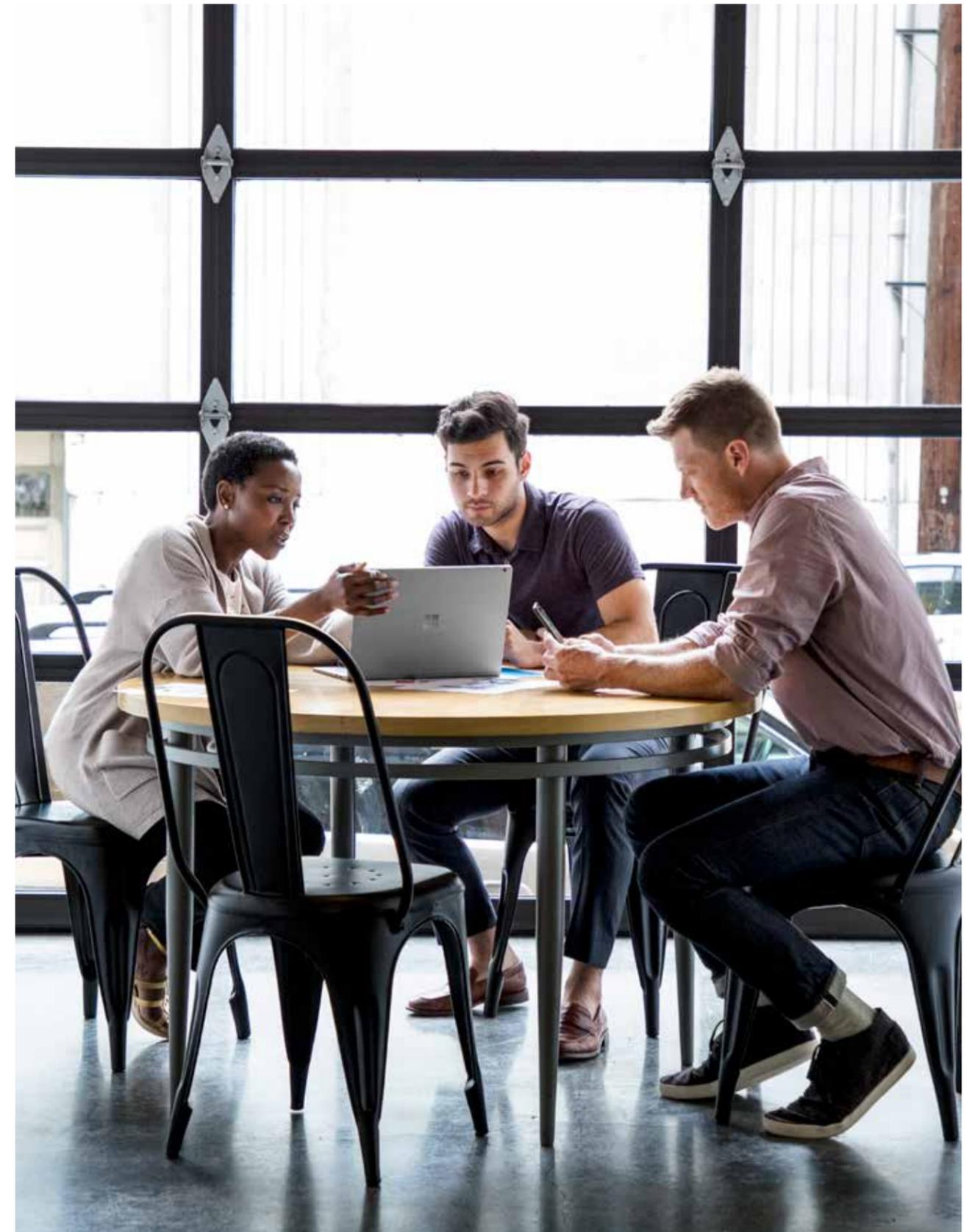
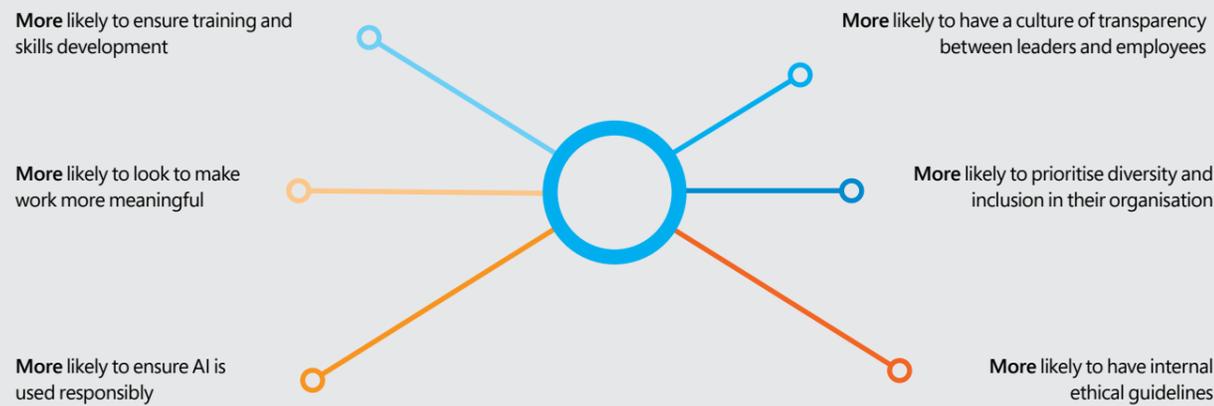
It is what David Gamez, Lecturer in Computer Science at the University of

Manchester, refers to as a climate of "unnecessary paranoia and fear." For Terry Walby, CEO of Thoughtonomy, tackling it ultimately comes down to communication. "The messaging behind AI is critical because the way we deploy automation in practice is that it's not a job destroyer, it's a job enabler. We're not automating workers, we're automating work in order to free up time for people to do things that are more productive or add more value to their roles and overall business."

"The messaging behind AI is critical. We're not automating workers, we're automating work."

– Terry Walby, CEO, Thoughtonomy

Figure 6. Profile of a 'should' company



Case study: An ethical approach to AI



Agrimetrics, a big data platform for the agrifood sector, is using Microsoft's AI technology to help make the food industry more resilient. Chief Scientific Officer, Richard Tiffin, explains the importance of taking an ethical approach to AI to build trust and transparency among customers.

What are the biggest challenges your industry is facing today?

We're working to help our customers build a more connected and resilient food system – whether they are a retailer, water company, or farmer.

In the next 20 years, we are going to have a lot more people on the planet, so the industry needs to find a way to feed these extra people under increasingly challenging circumstances created by mounting competition for finite natural resources and climate change.

Today, the food system is extremely complex. As a result, it is prone to unpredictable outcomes. I tend to use the financial system as an analogy. It worked effectively, but nobody really understood how. And what happened in 2008? A couple of mortgage companies in North America went bust, and the whole global financial system collapsed. The same thing could happen in the food system as a result of a shift in weather patterns or natural disasters.

How are you using AI to address these challenges?

We are trying to ensure the food system doesn't have that inherent vulnerability to small changes that produce very large and unpredictable outcomes. AI is not the only solution to achieving this, but it is helping us better understand and respond to that sort of complexity.

Along our journey so far, we have come to realise that if we're going to make the food system more resilient and reliable, data has to be at the core of what we do. We cannot rely, as we have previously, on improved breeding or other more traditional ways of improving efficiency.

But the big challenge, for us and for anyone looking to use AI, is building trust. People who give their data to the kind of infrastructure that we are developing are inherently cautious about how that data is going to be used, and who is going to have access to it.

What have you learned on your journey so far?

As we have set out on our journey of adopting and using AI tools, we've realised transparency is everything. AI still feels like a very mysterious term to the vast majority of people, so it is essential that we communicate in an effective way around what it is that we are doing.

Similarly, with technology that is evolving so quickly, it's crucial that when things go wrong, we can be open about it, and have structured mechanisms in place to redress the impact. I'm sure these statements sound like common sense, but actually making sure it is put into practice is really crucial.

What advice would you give to other companies facing similar challenges?

One of the approaches we have taken is always to say that anybody who provides data to our platform has to retain control of that data and know how it is being used. They have to be able to permission and de-permission, if you like, the data at all times. By doing that, I hope we can build effective trust in the community.

In the field of AI, we often ask what is the right thing to do? There needs to be an appropriate regulatory framework, one that is not just driven by the possibilities of the technology. We need to have active conversations about the ethical and moral issues surrounding AI, just as we do with any technology. For example, human genetics is regulated by people who understand ethics and moral issues, not just by geneticists. The same should be done for AI.

Democratising AI

In many cases, allaying those fears can be achieved through a process of democratisation. Rather than feeling like passive recipients of new technologies, staff at all levels should be encouraged to see themselves as creators and collaborators in how new technologies are developed and introduced. To be part of steering the journey, not passengers swept up along the way.

Doing so is not without its challenges, especially in large legacy organisations where a more analogue culture and traditional ways of working are deeply ingrained. Here, leadership may encounter resistance because employees feel they are losing control or worry that AI will disrupt their existing plans or relationships – a fact borne out by our finding that only 37% of leaders and 31% of employees think it’s possible to democratise AI in the workplace.

Yet as Agrimetrics’ experiences show (see Case study on page 25), allowing people (be they customers or staff) to engage with technology and providing a clear explanation of its benefits at an individual level can go a long way towards converting antipathy into advocacy.

For employees, the challenge is to open their eyes to the fact that AI can augment and enhance their job rather than simply replace it – something that many seem to be doing already given 52% of those we surveyed agree that using AI to automate routine tasks creates time for more

“In order to deploy AI successfully and broadly across society, we really need to be building it in a way that incorporates everybody and speaks to everyone. You might be a customer service agent, or accountant, or a bus driver, but you should have an opinion because it is going to shape your life.”

– Josie Young, Transformation Manager, Methods

meaningful work. Meanwhile, for leaders, it is about equipping employees with the skills to work alongside new technologies and thrive in a transformed workplace. We explore this issue in more detail in Chapter 4 of this report.

Tackling bias

Alongside this fundamental human question, there are, of course, a number of other key – not to mention evolving – ethical considerations thrown up by AI’s rapid rise, including the problem of inherent bias.

As we discussed in the previous chapter, AI technologies are only as good as their data and, in nearly every case, that data is fed to them by humans. If it is misrepresentative, biased or downright wrong, the way the machine learns to use it will, in turn, be fundamentally flawed.

Increasingly, the view that algorithms are fair and objective simply because they use hard data is giving way to a recognition of the need for human oversight. Only by helping engineers eliminate data blind spots around factors such as gender, race, ethnicity, and socioeconomic background can we ensure that AI technologies deliver the unbiased, societally responsible outcomes we want.

As Matt Dyke, Founder & CSO of AnalogFolk, puts it: “We need to think of AI as a child and be good parents. We must help it learn in the right way because if we’re giving it the wrong data sets or non-representative data sets, it will learn in the wrong way.”

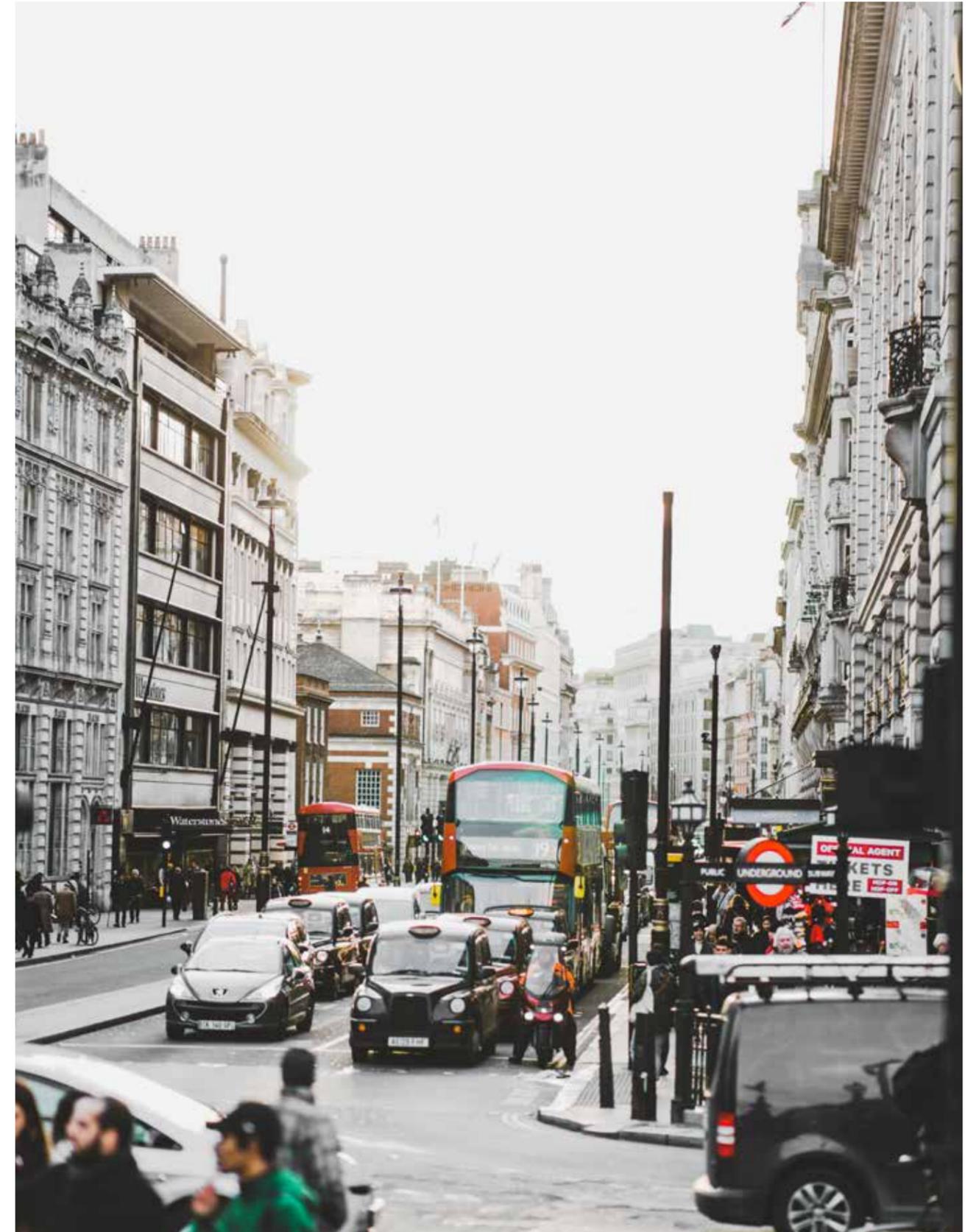
Privacy and security

Of course, no discussion around AI – or indeed any intelligent technology – would be complete without considering its implications from a data protection and privacy point of view.

Recent high profile breaches threaten to do long-term damage to trust in digital technology and, as a result, privacy and security will continue to dominate concerns for business, governments, and consumers alike. Indeed, of the leaders and employees we surveyed, 82% and 79% respectively believe applications of AI in business require strong regulation. Among the nation’s leaders, 53% also predict AI will raise more concerns, not fewer, about privacy and security.

“Transparency is everything. AI is a very mysterious term for the majority of people, so those of us that use it need to make sure we communicate what it is that we’re doing. And when things go wrong, being open about it is absolutely paramount.”

– Richard Tiffin, Chief Scientific Officer, Agrimetrics



The result for the AI industry is a classic catch-22 situation in which consumers will not share their personal data without reassurances it is being protected, but AI cannot prove that it is trustworthy without access to that very same data.

The key to success here is transparency. Only if organisations make a concerted effort to help people understand precisely how their AI solutions use and, most importantly, protect their data can they expect to gain their trust.

What is clear, both from our survey and our conversations with industry experts, is that developing and implementing an AI strategy is far more than just a technology programme. Given AI's unprecedented and transformational abilities when it comes to how organisations operate and the way they process data, there are a range of key social, legal, and ethical questions for them to answer about how, when, and where it is used.

Put another way, AI must not exist in a bubble. From its impact on the job market to the ramifications for data security, the ripple effects of its growing influence are – and will continue to be – many and far-reaching.

Reliability, safety and autonomy

In the same way privacy and security must be at the forefront of any organisation's mind when developing an AI strategy, it goes without saying that AI systems must perform reliably and safely. Yet, in reality, high rates of innovation, lack of transparency, and the 'black box' effect, in which an AI process works without any clear human understanding of how it arrived at its conclusions, can all negatively impact its reliability, along with how people perceive it.

The House of Lords report suggests that, as with concerns about privacy and security, transparency here is key wherein "AI systems are developed in such a way

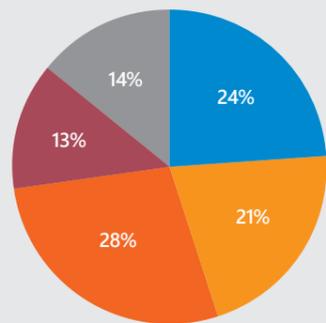
that they can explain the information and logic used to arrive at their decisions."

According to our research, UK workers agree. Across sectors, there is a near-unanimous view that AI governance cannot be left unchecked. Instead, organisations must take responsibility for the systems they build, even if those systems become self-reliant, then held to account if and when things go wrong.

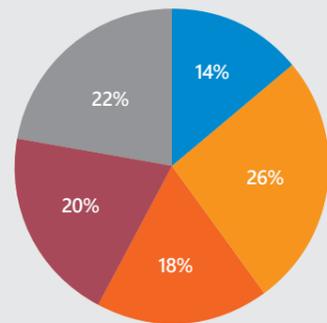
Wherever they are on their own AI journey, it is therefore incumbent on organisations of all shapes, sizes, and sectors to establish a clear set of technical, social, and human building blocks from which to move forward. Only then can they ensure they take each step as seamlessly, ethically, and responsibly as possible.

Figure 7. How should AI be utilised?

AI systems should be allowed to do this without any human oversight whatsoever



AI systems should not be allowed to do this at all



■ Approve mortgages or loans for applicants ■ Operate self-driving vehicles on public roads ■ Give legal advice to people
 ■ Write news stories and publish them online ■ Recommend candidates for employment

Go to the Industry spotlight section for industry specific scenarios

How to use AI responsibly



Learn:

Take a look at the Alan Turing Institute for inspiration around using AI to create positive impact at: www.turing.ac.uk

Alternatively, read more about Microsoft's own ethical approach here: <https://aka.ms/AI-approach>



Think:

Consider the existing ethics in your organisation. Categorise them by setting up an ethics committee, taking every area of your business, and developing to up an AI ethics committee and make efforts to classify them by taking every area of your business and developing two- or three-line statements explaining how to apply AI technologies to them. Clarifying values and aligning systems renews employee commitment and enhances morale, giving way to a trusting environment. This process should:

1. Promote a shared vision for success
2. State a clear purpose and set of values that employees can sign up to
3. Define key relationships between stakeholders
4. Measure culture and benchmark workplace actions against stated values



Do:

Assess tasks and areas to distinguish those that **can** be automated and those that **should** be automated. Review Microsoft's AI principles, published in its recent book 'The Future Computed' to guide your thinking: <https://news.microsoft.com/uploads/2018/01/The-Future-Computed.pdf>

These include:

1. Fairness – AI systems should treat all people fairly
2. Reliability – AI systems should perform reliably and safely
3. Privacy & Security – AI systems should be secure and respect privacy
4. Inclusiveness – AI systems should empower everyone and engage people
5. Transparency – AI systems should be understandable
6. Accountability – AI must have algorithmic accountability

Case study: Enhancing safety through AI



Seadrill's offshore drilling rigs sometimes work hundreds of miles offshore at water depths of up to 3,000 meters. As well as a laser focus on efficiency, safety is a vital consideration as it seeks to introduce smarter technologies to its operations. Kaveh Pourteymour, Vice President and CIO, explains how the company is using AI to deliver a win-win situation for customers and employees alike.

Why did Seadrill decide to invest in AI?

The first thing to say is that we have put digitisation at the heart of our business strategy. Really, we have three focus areas. One: to make our assets more intelligent to improve performance and longevity. Two: to give our people the right tools to become more knowledgeable and more productive. And three: to make our end-to-end value chain more optimised and integrated, starting with our customers right through to our suppliers and partners. We use technology in each of these elements and AI plays a very important role.

How, specifically, is AI helping?

Particularly, when it comes to making our assets smarter. Our offshore drilling fleet is one of the largest and most modern in the industry. The rigs have standardised equipment onboard, and, through the use of AI, we are making that equipment operate more reliably and safely – two critical factors in an industry like ours. So, for example, we are already using it for equipment monitoring and anomaly recognition. We have digital twins - virtual representations - of our critical equipment where we can monitor in real time if certain parts need attention or inspection maintenance. This is allowing us to predict failures onboard before they happen, meaning we can schedule maintenance accordingly. This, in turn, helps keep productivity as high as possible and minimises repair costs.

You mentioned augmenting your people? What role is AI playing there?

The way we use AI for our people is in enhancing their capabilities and capacity. We want to make our employees more knowledgeable, so we have introduced enterprise search technology to make sure they have access to the right information, at the right time. We have also used the Microsoft Azure Bot Framework to create a number of bots to support our employees onshore and on our rigs. One of these bots provides IT support, while another helps with training needs. It means questions and issues that may have taken a long time to reach the right person for a response can now be dealt with in a matter of minutes.

We also use the natural language processing capability of these bots, so our people can speak to them in any language using normal phrases, and receive the information back in any language too – including from each other on platforms like Yammer. This is vital for a multi-national, multi-lingual organisation like ours. It makes communication much quicker and easier, and is really helping foster collaboration productivity and knowledge in our workforce.

And, the third focus area. How is AI helping optimise your value chain?

Efficiency of supply chain is a particular area of focus for us. We have recently implemented Maximo for our maintenance and inventory management. While Maximo is a good system of records, we are now looking at enhancing it with a system of intelligence, again AI-enabled, on top that allows us to optimise the inventories and the logistics.

Finally, how are you balancing the use of AI with the need to maintain rigorous safety standards?

Safety in our industry and on our rigs is fundamental.

We focus a lot on using technology – all technology, not just AI – in the right way to improve the safety of our people and our rigs. Remember, we are talking about offshore drilling rigs that can be hundreds of miles offshore, operating in up to 3,000 metres of water, and drilling to depths of 15,000 metres or more. So, the technologies have always had to be very safe, advanced and reliable. Adding in AI means we can more easily harness all the information from the various different sensors and devices to draw actionable insights. This enhances safety onboard, makes our operation more efficient and ultimately, be more predictable in delivery of quality wells for our customers. This is good news for our customers, our people and our partners. It's a win-win for everyone.

Developing tomorrow's skills, today

Culture, people, impact



While much of what we have heard so far has centred around the need for organisations to embrace AI technologies in the right way, there is also a more practical piece of the puzzle to consider. Namely, that to succeed in an AI-augmented workplace, employees must be equipped with the skills and learning approaches needed to collaborate with new technologies and evolve their jobs for the better.

Of course, there can be no denying some jobs will be lost to AI. Others will change significantly. And many new ones will appear. Today 45% of employees are concerned their job could be taken by AI, and yet 51% are not actively learning new skills to keep up with future changes to their work as a result of AI – this raises cause for concern.

However, many UK organisations are just at the beginning of the journey, and, as with the adoption of the Internet and the cloud, there will be lots of steps along the way – some of them will test resilience and commitment and ask

difficult questions. But as we've seen from previous examples of technological revolution, the potential long term benefits make this journey important and necessary.

“AI will make us re-think what it means to be human.”

– Matthew Griffin, Futurist & CEO, 311 Institute

As Julie Shah, Associate Professor of Aeronautics at MIT, points out in Reshaping Business with Artificial Intelligence: Closing the Gap Between Ambition and Action from the MIT Sloan Management Review, an important challenge when it comes to skills, will be to ensure the relationship between human and machine is as seamless and collaborative as possible.

“Traditionally, people have learned in education and then entered the workplace. AI will significantly change this as the pace of development means we must constantly adapt and learn throughout our lives. Our approach is to empower every member of staff to achieve more by creating a range of blended opportunities for 21st century learning and skills development. We want to foster a ‘learn-it- all’, not ‘know-it- all’ culture.”

– Ian Fordham, Chief Learning and Skills Officer for Microsoft UK

Humanising AI

What is clear across the board is that as AI's capabilities extend, the nature of that interface and the distribution of skills between humans and machines will evolve. Until now, the majority of AI augmentation has occurred in the form of automation, where relatively simple AI is applied to narrow problems and easily repeatable tasks. As the technology's cognitive and perceptive abilities improve, the range of skills it can acquire will: a) grow; and b) be increasingly used to improve our everyday work and productivity.

A good example of how this can augment job roles is the burgeoning use of AI in back office systems to scan documents, autofill forms, and perform a host of other low-level tasks. This frees up employee time to focus on the more 'human' requirements of their job, like critical-thinking, empathy, and creativity. Far from a recipe for job loss, the near-term predictions here see automation as a liberating force, rather than an oppressive one.

Case study: The human rewards AI can bring to a business



Confused.com CEO, Louise O'Shea, and business consultant, Rex Johnson, reveal how they are embracing AI to empower the Confused.com workforce, boost morale and foster the development of new skills across the business.

How is your company using AI to change and adapt?

LO'S: Firstly, we spent time moving to the cloud and getting our data and infrastructure in place, so we could really think about how we embrace AI to deliver a better experience for our customers. If we are able to better understand and offer what they need, then we can provide a personalised service, and help save them time and money. We're right at the start of what feels like an exciting journey with AI.

RJ: As Louise says, we have got our systems up into the cloud, including all our data, and we are really seeing the benefits of that now. It makes AI far more accessible than it used to be and it means we can look at adopting more without spending vast amounts on infrastructure, such as a chatbot for customer support, sentiment analysis, and automation. Automation is the area that we are really starting to focus on. We recognise that the more things we can automate, the more we can take away time-consuming and repetitive tasks for our people.

What impact has the use of AI had on your workforce?

LO'S: AI is not solely the preserve of the technology department, it is becoming diffused across the business. Our employees are learning about it through what we call our "School of Tech", which Rex runs for the company. They are seeing the possibilities for themselves, and they are then applying that to their everyday jobs.

Can you share an example?

RJ: For example, one of our non-tech guys was interested in automating some of the manual tasks that were taking up quite a lot of his time. Basically, taking things from one spreadsheet and putting them into another area. We got tech help for him and he has embraced that, and he is now able to write some easy code to replace those manual tasks with automated ones. He has freed himself up to do more valuable and interesting work.

LO'S: What is exciting is that it is not something we are pushing. We have got that groundswell of enthusiasm from the employees themselves. They go to things like our School of Tech and apply what they have learned to own the automation element of their role and give themselves opportunities to work in new and interesting areas that can progress their career.

Providing training and helping people learn in new ways is something that is very important to us. We regularly do brown bag sessions around things like machine learning and deep learning, and we recently did a series of 'Code With' sessions with Microsoft. The team was just beaming from ear to ear because they were learning so much. The culture of continuous learning becomes infectious, and it just builds from there.

What kind of human skills does Confused.com need to foster along with the development of AI?

LO'S: Something that really surprised me was the possibility to truly democratise the technology. I recently sat down with someone from my team and used a machine learning tool. Despite not having a background in maths, statistics, or coding, I was able to use it quite easily. It really struck me that AI is not technology that sits solely within the IT team. We all have the ability to learn and it is important we look to democratise AI across our business.

RJ: Louise is right. As AI grows, the heavy lifting in areas such as data science, statistics, and maths are less needed and can be replaced by AI technologies. What is obvious, however, is that you do need a set of soft skills, such as social science, that augment these harder ones. These soft skills come into play more as the role of AI increases within an organisation.

LO'S: The soft skills are really important to our business. We are the consumer champion and doing right by the customer is what we fight for. Since our inception, we have disrupted the insurance industry to make it better for customers. If our people can free themselves up to spend more time doing that, it can only be a good thing.

Connecting leaders and employees

Given this need to humanise and democratise AI, organisations should resist viewing the integration of it as an either/or situation. One in which harnessing the power of the technology comes at the expense of their human staff. Instead, AI should be seen as an additional feature of the workforce that employees can work alongside to enhance everything from individual productivity and performance to job satisfaction and peer-to-peer learning.

Yet, of course, for that to happen, employees at all levels must be armed with the expertise to bring the best out of both themselves and the technology – something upon which Microsoft is placing considerable emphasis. “Traditionally, people have learned in education and then entered the workplace,” explains Ian Fordham, Chief Learning and Skills Officer for Microsoft UK. “AI will significantly change this as the pace of development means we must constantly adapt and learn throughout our lives. Our approach is to empower every member of staff to achieve

more by creating a range of blended opportunities for 21st century learning and skills development. We want to foster a ‘learn-it-all’, not ‘know-it-all’ culture.

The good news is that our research found leaders and employees largely agree that change is coming. Similarly, when asked how AI might impact work in general, employees themselves display a refreshingly optimistic outlook. (See Figure 8.)

Furthermore, nearly half (46%) of UK leaders believe it is worth investing in retraining their current workforce, and equally 45% believe developing new skills in the workplace is essential to future success.

However, although the need for new skills is recognised, exactly how they are acquired remains a matter of confusion. Around a third (32%) of leaders admit to being unsure about how to start preparing staff with the skills they need for the future while, in many cases, the two groups exhibit very different views on what those skills should be in the first place. For example, 47% of leaders believe creativity will be a key skill for

“I think what is very important in the world is that technology has to work for everyone. All too often it can help those people who are more fortunate while creating a barrier for those that don’t have access to it.”

– Matt Dyke, Founder & CSO, AnalogFolk

the future – a number that drops to just 29% among employees. Meanwhile, 56% of leaders cite resilience as a vital characteristic for tomorrow’s workers compared to 44% of employees.

On the flipside, nearly half (45%) of employees feel the ability to develop new processes will become more important to their jobs – anything from overseeing the automation of certain administrative tasks to establishing better models for cross-border collaboration. However, only 15% say their organisation is providing support to help them do it. Moreover, just 18% say they are actively learning new skills that will help them keep up with future changes to their work caused by AI.

Clearly, leaders and employees need to be aligned on the skills required in an AI-driven workplace. So, how can organisations put the right training and development plans in place to equip their people for the future?

EQ and IQ

A strong learning culture and an agile approach to skills development is critical

for organisations to prepare employees, and by definition their operating models, for the AI era. Indeed, our research shows that those with a culture of learning and collaboration, where employees have the technical knowledge and opportunity to take risks, have been shown to perform 10% better than organisations that score low on these factors.

Successful employers will, therefore, invest in AI-enabled, blended learning

46% of UK leaders believe it is worth investing in re-training their current workforce...

but 32% are unsure about how to start doing so.

and development programmes to keep their staff’s skills relevant, thereby allowing them to evolve in line with the introduction of new technologies and the shifting requirements of their roles.

Above all, they will recognise the need for their people to develop new technical abilities alongside other skills required to thrive in tomorrow’s workplace, such as complex problem solving, analytical thinking, and creativity. (See Figure 9.)

Similarly, a recent report led by the All Parliamentary Group on Artificial Intelligence highlights ‘learning to learn’ as the key skill workers will need to survive and thrive in the future. In particular, the report identifies three key skill categories:

1. Skills to build/manage AI
2. Skills to work with AI
3. Skills to live in an AI-driven society

It also calls for organisations in both the public and private sectors to equip people for that future – something Us AI Co-Founder, Pete Trainor, believes will come down to them “knowing the difference between claiming to be empathetic and truly having empathy at their core.”

Figure 8. **Optimistic employees? Attitudes towards the future of work with AI**

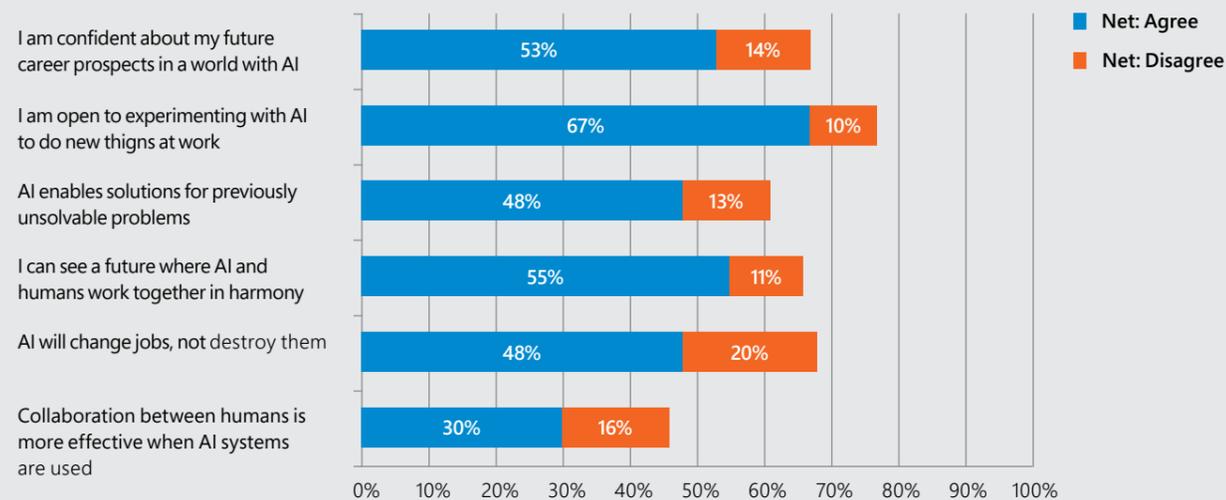


Figure 9. **World Economic Forum Future of Jobs Report: Top 10 skills – 2018 vs. 2022**



Source: Future of Jobs Survey 2018, World Economic Forum.

In other words, the organisations that thrive are likely to be the ones that build a culture that supports continuous learning, investing time, and resources into really getting to grips with what workers need to evolve alongside the AI.

Doing so can deliver success on both sides of the coin. For the organisation, it ensures its workforce is prepared and agile enough to adapt quickly to new technological challenges. Returning to the S-curve model we considered in Figure 2 on page 5, this helps reduce the risk of progress plateauing during the transition phase. Meanwhile, for employees, any anxiety about becoming obsolete can be replaced with a sense of personal growth and job satisfaction. A feeling of doing more meaningful work.

Building trust

The other positive effect of investing in the use of AI to augment and humanise their workforce rather than dehumanise it is the ability to build public trust. As we saw earlier, 53% of leaders believe AI will

throw up more data and privacy concerns – not fewer.

Interestingly, there is a wide range of views about when and where AI should be allowed to operate, especially when unsupervised. (See Figure 7.) So, while 42% of UK leaders believe AI systems should only diagnose conditions for hospital patients with constant human supervision, that number drops to 26% when it comes to operating self-driving vehicles on public roads.

58% of UK leaders believe using AI to automate routine tasks creates time for more meaningful work. 49% think it can make them more productive.

These findings underline: a) the many roles AI can already play in daily life; and b) the fact that, in many cases, it continues to be greeted with some suspicion.

As we explored earlier in Chapter 2, this scepticism is not necessarily a bad thing as it provides a useful checkpoint for innovation. However, as Professor Neil Sebire, Consultant Pathologist, Chief Research Information Officer and Director of DRIVE at Great Ormond Street Hospital, highlights in “Unhealthy logic?”, organisations should also accept that such fears cannot always be rationalised with cold, hard logic. In these situations, a more patient and collaborative approach is required.

Clearly, there remains an over-riding sense that people can be trusted more than machines, regardless of how intelligent the technology gets. Organisations that can show they are harnessing new AI technologies by having them work alongside a workforce of well-trained, digitally-savvy humans are, therefore, more likely to be trusted with

people’s data and privacy in the long run than those that cannot.

This is not a question of restricting innovation or slowing it to a pace with which we humans can keep up. After all, progress will always be bound to the advancement of technology. Rather, it is about recognising that AI itself is just one part of the picture. Yes, there will be job losses and many of today’s roles will probably look very different in just a few years’ time. But what will not change is the fact that people are paramount too.

As AI’s capabilities continue to evolve and expand, the organisations best placed to succeed will be the ones that recognise human plus machine tends to outstrip human or machine. That focus on augmentation, not just automation. From building trust to improving productivity, a culture that empowers employees to grow, improve and collaborate with technology rather than compete with it can, ultimately, deliver better outcomes for everyone – and everything – involved.

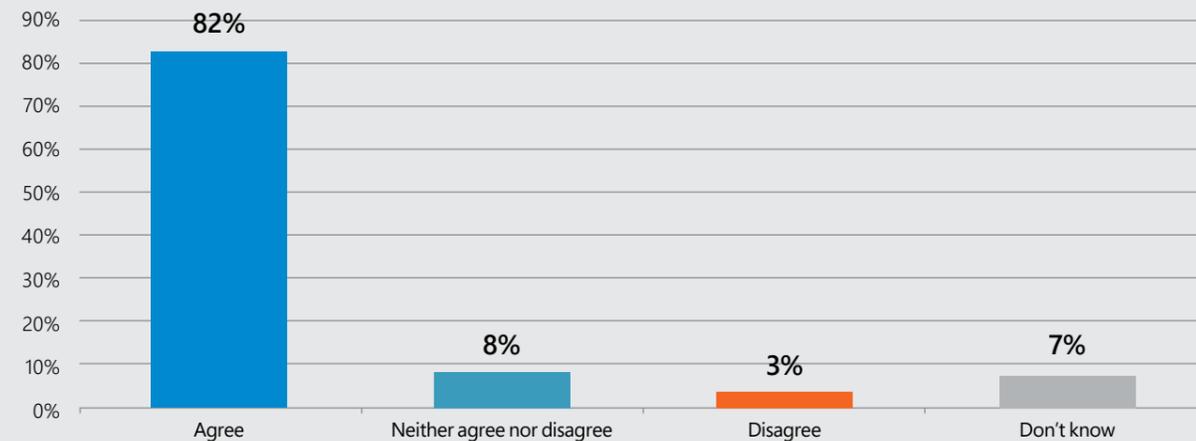
Unhealthy logic?

When interviewed for this report, Professor Neil Sebire, Great Ormond Street Hospital’s Consultant Pathologist, Chief Research Information Officer and Director of DRIVE, a new unit at the hospital transforming the use of technology and AI in healthcare to improve patient outcomes, provided a compelling example of how fears around AI are not always shaped by fact.

“Currently, it is estimated that around 70% of medical conditions are diagnosed correctly first time in standard medical practice. This means about a third of first diagnoses are initially wrong. Patients seem to accept that. However, if we were to bring out an AI system and say one out of every five of the diagnoses will be totally wrong, I am sure they would reject it as a terrible system, even though that may be a better success rate than with human doctors.”

Figure 10.

When AI systems behave in unforeseeable ways, humans need to take responsibility



The power of continuous learning

David Rendell, a web-production assistant at Confused.com, recently took part in the business’s School of Tech initiative, which aims to pair tech staff with non-tech staff in order to optimise repetitive and time-consuming tasks. For him, the benefits of this collaborative learning approach were clear and, virtually, immediate. He explains: “As part of the project I managed to automate a weekly task that involved manually editing a large HTML document. What once took me an hour now takes me five minutes, and it has helped to take human error out of the equation. Now our department finds itself constantly questioning our current processes and asking how they could be improved and made more efficient.”

How to develop tomorrow's skills, today



Learn:

Read NESTA's report on 'The Future of Skills: Employment in 2030': www.nesta.org.uk/report/the-future-of-skills-employment-in-2030

The report maps out how employment is likely to change in the future, including the important implications for skills in sectors as varied as education, healthcare, finance, engineering, architecture, manufacturing, and design. Pay attention to the skills that are likely to be in greater demand in the future which include: interpersonal skills, higher-order cognitive skills, and systems skills.



Think:

Define how you want to use AI and create a talent map to understand the core skills in your organisation today, and those you need to develop. Remember to consider:

1. The current strengths and weaknesses in your skills required for the mid- and long-term
2. The confidence, proficiency, and potential of current employees within these areas
3. How to build new skills – including in-house skills programmes, recruitment, and harnessing your partner network

Remember to create a culture of continuous learning and improvement within your organisation to support skills development. Demonstrate to colleagues how you are taking quality time out for your own learning and articulate the value of this experience. Seek regular feedback that challenges your views and forces you to try different ways of doing things.



Do:

Encourage employees of all levels to use free online learning tools like www.edx.org to upskill.

They can also sign up to Microsoft's Digital Skills Programme here: <https://aka.ms/digital-skills>. From computer basics, to Microsoft Office 365, Excel, PowerPoint, and LinkedIn, these courses will help employees build digital literacy. That way, they can begin computing with confidence, stay safe online, and increase productivity.



Conclusion



So, what does all this mean for UK organisations looking to harness AI's undoubted potential? Primarily, that the successful and effective use of AI reaches beyond just an organisation's bottom line, productivity, or sales. It must be used responsibly and equitably too.

As we have seen and heard from our survey, industry experts, and case studies, there are three key themes that will provide the guiderails for the development and use of AI across a wide variety of sectors. Crucially, none of these factors stand alone. Rather, organisations should see them as three symbiotic parts of a successful and ethical AI strategy. They are:

1. Embrace AI's potential or risk being left behind

The need for organisations to get their AI journey started and future-proof their success.

2. It's not what AI can do but what it should do

The need for organisations to take an ethical approach that ensures AI has a positive impact from a social perspective as well as an economic one.

3. Developing tomorrow's skills, today

The need for organisations to equip employees to use AI to augment their roles and do more meaningful work.

Delivering against these needs is as much about mindset as the technology itself. Why? Because it requires organisations to be laser-focused on key social issues, like data privacy and the democratisation of technology. It means thinking in terms of workforce augmentation, not automation. And it involves investing the time and resources into helping employees understand the benefits of AI and then equipping them with the skills to thrive in a transforming workplace.

Organisations can and should take heart from the fact that the platform for change is laid. Indeed, with 67% of leaders and 59% of employees saying they are open to experimenting with AI to do new things at work, a willingness to embrace the AI era – or to return to the analogy we explored in Chapter 2: to get on the bus – is clear.

Even more importantly, organisations that are investing in establishing the right approach to AI technology now – specifically, by developing underlying values, ethics, and processes – are shown to be outperforming those that are not by 9%. This, in itself, is a compelling case for transformation.

Where work must be done is in turning awareness of AI's potential into tangible action to harness it. The gap between what skills leaders perceive workers will need in the future and what employees themselves think is concerning – and must

be addressed. First, by aligning all levels of the organisation as to exactly how and why AI will be integrated into day-to-day operations. And, then, through an emphasis on training and development to help staff evolve their jobs alongside the technology, rather than feel superseded by it.

Meanwhile, governing it all must be a strong ethical framework with human values at the centre. A framework that protects data privacy, guards against the malicious misuse of AI, and lays out clear guidelines around issues like inherent bias, automation, and where responsibility lies when things go wrong.

AI is a vital step on the UK's journey of digital transformation – a step that will look different for every organisation according to its own individual characteristics, history, and operating landscape. Yet there is uniformity to be found here too. From optimising operations and transforming products, to engaging customers and empowering employees, there can be no doubt that AI is set to re-invent traditional ways of working across sectors, geographies, and industries.

The door to the AI-augmented future is open. The time has come to step through it.

“AI will revolutionise our world. It will change how we work and how businesses succeed. If UK organisations are to thrive in the future, we have to evolve and embrace the application of AI. First, we have to make sure that AI is ethically grounded. Then, we have to help equip our employees for AI, so that they turn the challenges of innovation into an opportunity. AI has the potential to make our lives easier and more productive, it's now up to us to get ready for the journey ahead.”

– Clare Barclay, Chief Operating Officer, Microsoft UK

The first five steps on your AI journey

- 1 Identify the business problem(s) you want to solve.
- 2 Determine how ready your organisation is to build, manage, and support AI applications.
- 3 Develop an AI manifesto setting out how AI can solve the business problem(s) along with how you will use it ethically and responsibly.
- 4 Foster a culture in which employees can continuously experiment with AI solutions, evaluate them, and suggest iterative improvements.
- 5 Great AI needs great data – so evaluate yours. Is it organised, bias-free and accurate enough to support smarter decision-making and better working practices?

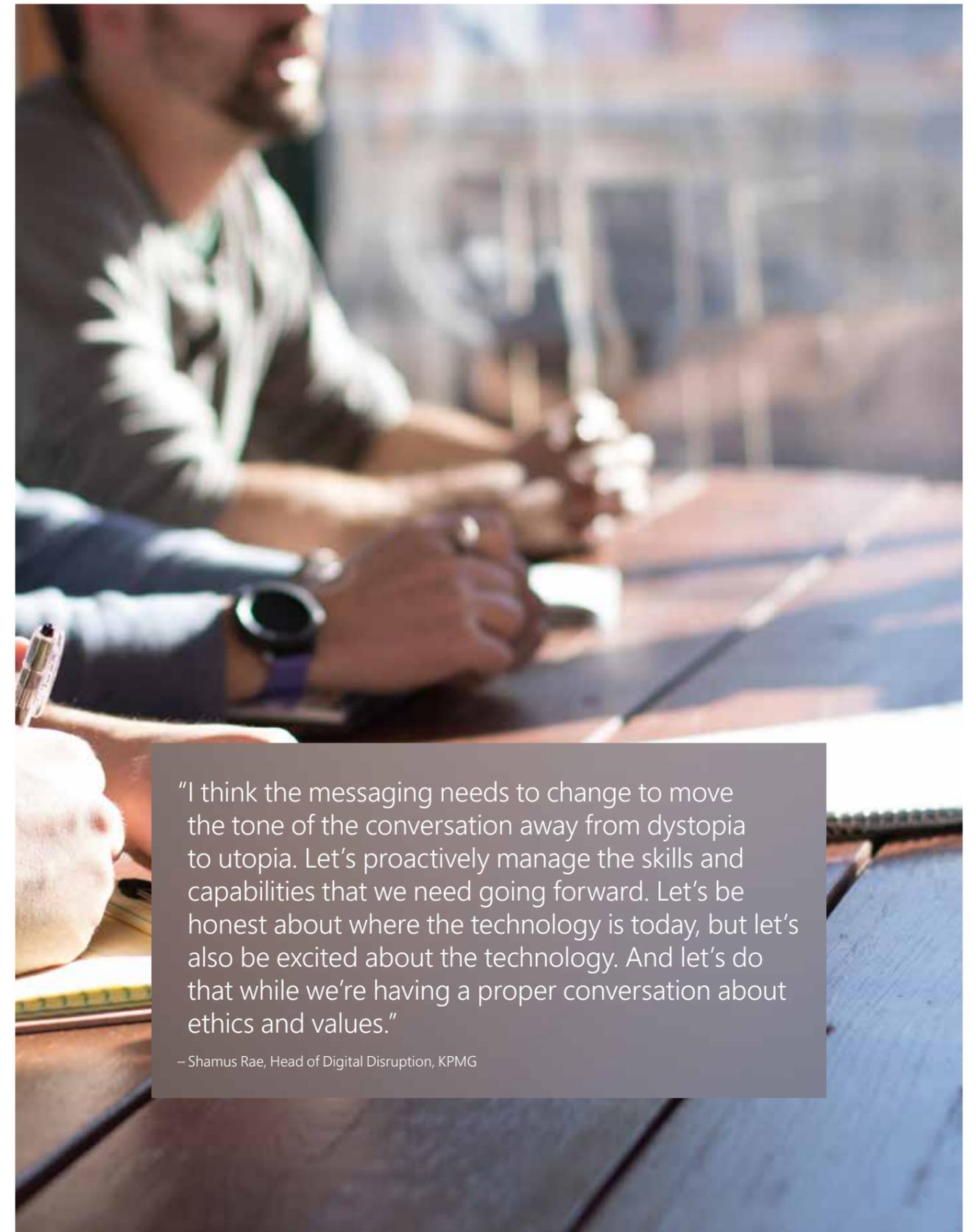
What should I do next?

To share this report with peers and colleagues, please visit:
<https://aka.ms/UKAIreport>

To start your AI journey today, please reach out to Microsoft directly or speak with one of our partners

To find a partner that has committed to developing and implementing AI responsibly and ethically, please visit: <https://aka.ms/ukaipartners>

To find out more about Microsoft's approach to AI, please visit:
<https://aka.ms/AI-approach>



"I think the messaging needs to change to move the tone of the conversation away from dystopia to utopia. Let's proactively manage the skills and capabilities that we need going forward. Let's be honest about where the technology is today, but let's also be excited about the technology. And let's do that while we're having a proper conversation about ethics and values."

– Shamus Rae, Head of Digital Disruption, KPMG

Industry spotlight

AI in Financial Services

London is currently the world's Fintech capital, home to some of the most successful and respected financial institutions. Yet it is also a sector under growing scrutiny. On one hand, the UK government is actively seeking to create new standards to accommodate the disruption and regulatory changes caused by a rapidly evolving marketplace. Meanwhile, a series of reputational crises around operating standards and data privacy have eroded consumer trust in the sector as a whole.

It is against this turbulent backdrop that financial services organisations must seek to drive their own digital transformation. It is a task which many are taking on. Indeed, a recent survey by Adobe of the senior leaders in the industry suggested 61% of organisations are either using AI

now or plan to adopt it within the next 12 months. Of those currently using it, 43% employ AI for either data analysis, onsite personalisation, testing or optimisation.

Similarly, our own research reveals that the financial sector is leading the way in the use of a variety of AI technologies. (See Figure 11.) These include: machine learning; research AI; haptic technology; virtual assistants; and Big Data analytics. Although, it should be noted that, in the latter case, all industries included in this report rank highly, suggesting this is a cross-sector trend rather than one specific to financial services.

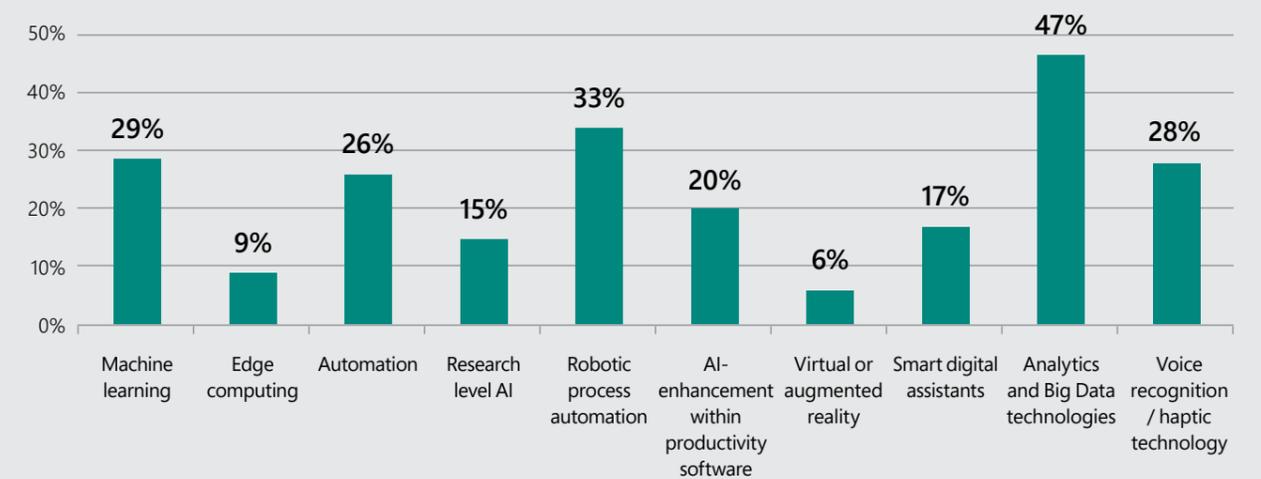
Yet despite this dynamic uptake of AI technology, there is a clear gap between adoption and the reskilling of staff. Indeed, while 54% of UK financial services leaders believe it is worth investing in

re-training their current workforce, only 18% of the industry's workers say they are learning new skills to keep up with future changes to their work caused by AI. In other words, while the sector is doing a good job of getting interested in AI, it is behind the curve when it comes to arming workers with the tools required to unlock the technology's full potential.

It is perhaps not surprising, then, that there remains a degree of distrust among people in the UK when it comes to AI's ability to manage tasks on its own. Across leaders and employees, only 5% of those surveyed believe AI should be allowed to make decisions about loan applications and mortgages without human oversight. And this is despite the potential to streamline a traditionally laborious process for all involved.

Figure 11.

Forward-thinking financiers: How UK financial services organisations are currently using AI, according to their leaders



Similarly, as we see in Figure 12 below, an even smaller number – just 2% – of leaders and employees would trust AI to make financial decisions on behalf of their organisation unsupervised. More than a quarter (26%) of leaders think it should not be allowed to do so at all.

So, what does this mean for the financial sector as it seeks to move on from plastic cards and savings accounts, embrace technologies like predictive analytics, mobile and voice, and ultimately, succeed in the digital era? An era in which consumers will be ever savvier about managing their money, more capricious about who they bank with, and increasingly cautious about the data they share?

Here, the ability to demonstrate the ethical and responsible use of technology – and AI in particular – will be vital to their success.

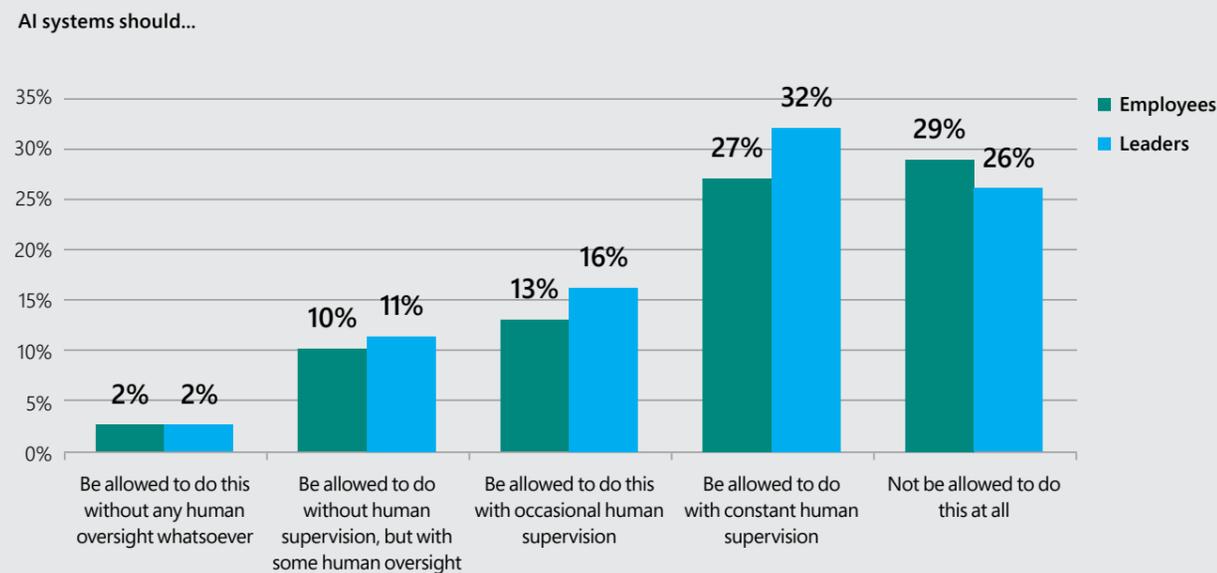
Indeed, as we hear from Brett King, Futurist and CEO of mobile banking start-up, Moven, harnessing AI's abilities to enhance processes and deliver smarter, more seamless customer experiences is just one part of the puzzle.

Instead, some of the most important steps on the path ahead rest not with technology but with people. Only by building a workforce capable of getting the best out of AI and, crucially, doing so in a way that engenders trust among consumers and regulators alike, can financial organisations hope to thrive in an augmented future.

“The key for financial services organisations is how their people are going to work with AI. They need to identify which jobs might change as well as new areas the workforce can expand into.”

– Brett King, Futurist and CEO, Moven

Figure 12. **Supervising AI: Making financial decisions on behalf of organisations**



The expert view



Brett King
Futurist and CEO, Moven

“We must recognise that financial services organisations have been built on very manual processes. Think about the products we have today – credit cards, debit cards, savings accounts – these were originally designed for distribution through community-based branches. Over time, the industry has iterated products with technology, but for the most part has kept its branch-based distribution model with retail products and human-based processes. A great example is the first version of internet banking, which was mostly about putting bank statements online.

In the future, the successful players will be those that find ways to integrate banking into the life of the consumer in a much more seamless way. Predictive analytics will be a big part of that. For example, today banks are waiting for consumers to come to them and apply for credit, and then they determine if it is too risky or not. In the future, this can be done in real time, as it is needed. So, for a consumer that wants to buy a new phone, an AI system could recognise this and serve a credit offer when they walk by a phone store, so they don't have to wait.

The key for financial services organisations, though, is how their people are going to work with AI. They need to identify which jobs might change as well as new areas the workforce can expand into. This transition will be a challenging period and adaptability will be an essential attribute for everyone.”

What should financial services organisations do next?

“Consider how to resurface the core utilities of banking – the ability to store value, send money safely, and access credit – through new technologies. Today, a lot of this is done through our smartphones. Tomorrow it will be through a voice assistant and, eventually, augmented reality.

Don't be a slave to the past. People are unlikely to need a plastic credit card in the future, so trimming away all that product structure and being able to serve that utility through a new technology layer will be a huge advantage.”

Industry spotlight

AI in Healthcare

Technological augmentation in healthcare has been happening since the 1992 ROBODOC system first assisted in hip replacement surgery. Fast forward to today, and the opportunities for its use are considerable – and exciting.

As the recent House of Lords report 'AI in the UK: ready, willing and able?' explains: "Healthcare is one sector where AI presents significant opportunities [...] because research and development will become more efficient, new methods of healthcare delivery will become possible, clinical decision-making will be more informed, and patients will be more informed in managing their health."

Many of the AI applications already in operation or currently being trialled have the potential to not only improve outcomes for patients, but also ease the pressure on a sector that is famously slow-moving, heavily scrutinised, and perennially over-stretched.

For example, there are currently 44 Da Vinci robots (remote, precision surgical arms) in use in England and Wales, all of which are helping deliver tangible benefits for patients and surgeons alike. These include: shorter hospitalisation; reduced pain and discomfort; faster recovery times; and minimal scarring.

Other examples include wearable devices to assist in patient monitoring, along with the increasingly sophisticated use of computer-aided-diagnostics (CAD) in radiology.

Where challenges emerge is in determining exactly when, where and, crucially, how autonomously AI should be used (see Figure 14). Indeed, as you might expect, significant caution remains around the possibility of AI operating without close human supervision. Even as its potential to assist with medical diagnosis increases, 42% of UK leaders and 39% of employees believe AI should be constantly

monitored. Interestingly, nearly a quarter (22%) of employees say it should not be allowed to do this at all.

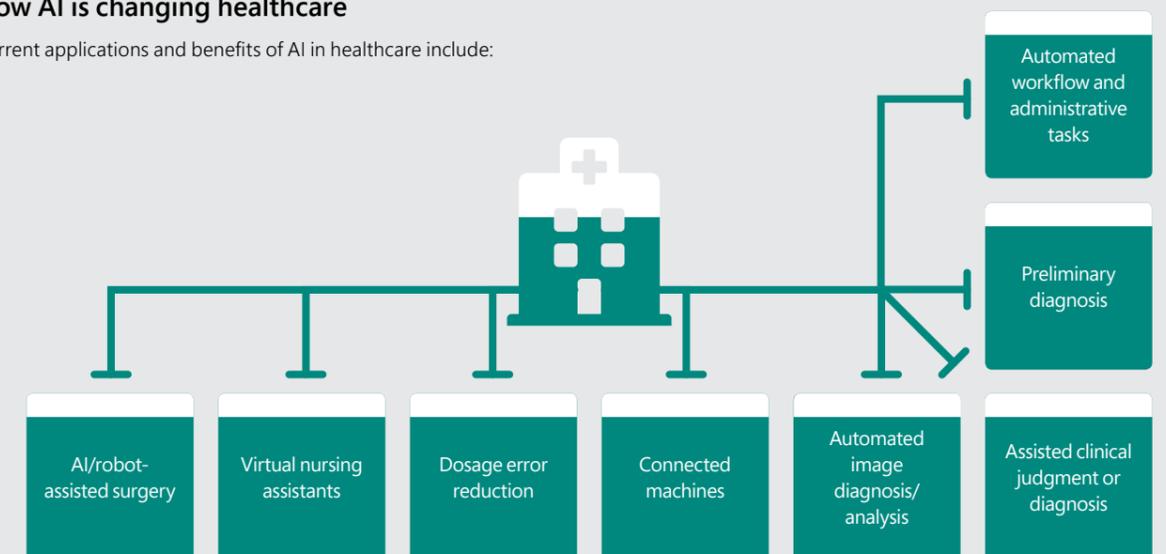
As for how to drive the sector's digital transformation, in the words of Professor Neil Sebire, Consultant Pathologist, Chief Research Information Officer and Director of DRIVE at Great Ormond Street Hospital: "You can't shut the hospital to replace all your technology. It's like saying to someone we need you to change the engine in this aeroplane, but we can't land."

In other words, the pressure to maintain a seamless quality of care for patients makes implementing any kind of infrastructure change – whether it's a major, hospital-wide data analytics tool or a new AI-driven surgical procedure – extremely challenging. Add to that the enormous data protection issues associated with holding patients' medical data, along with the fact that most of the sector's employees are of a medical background

Figure 13.

How AI is changing healthcare

Current applications and benefits of AI in healthcare include:



not a technical or data science one, and there is a real danger of the 'black box' effect, wherein the logic and processes behind medical AI decisions cannot be traced, audited, or validated.

Unsurprisingly, given the high stakes – namely, the health of patients – this often leads to widespread scepticism when it comes to the introduction of new AI technologies. Indeed, more than a third (36%) told us they feel sceptical about the use of AI in healthcare.

For the healthcare sector, then, the path to an AI-augmented future will be complex – despite being among the first adopters of robotics and AI systems. From data privacy to the need to continually prioritise patient care above all else, the challenges of transforming a vast, legacy establishment

like the NHS into a fully-functioning, digitally-led organisation are significant.

Yet, as the House of Lords report reminds us, the platform for progress is laid. The potential benefits of AI technologies are exciting. And the opportunity to save lives, improve quality of care, and ease the burden on the UK's doctors and medical professionals is real.

Of the nation's healthcare leaders and employees, 58% told us they are open to experimenting with AI to do new things at work. Yet, at the same time, only 17% are actively learning new skills to keep up with the future changes to their work caused by AI. Redressing that balance and embracing the possibilities AI offers will be difficult. But it is an opportunity the sector can ill-afford to pass up.

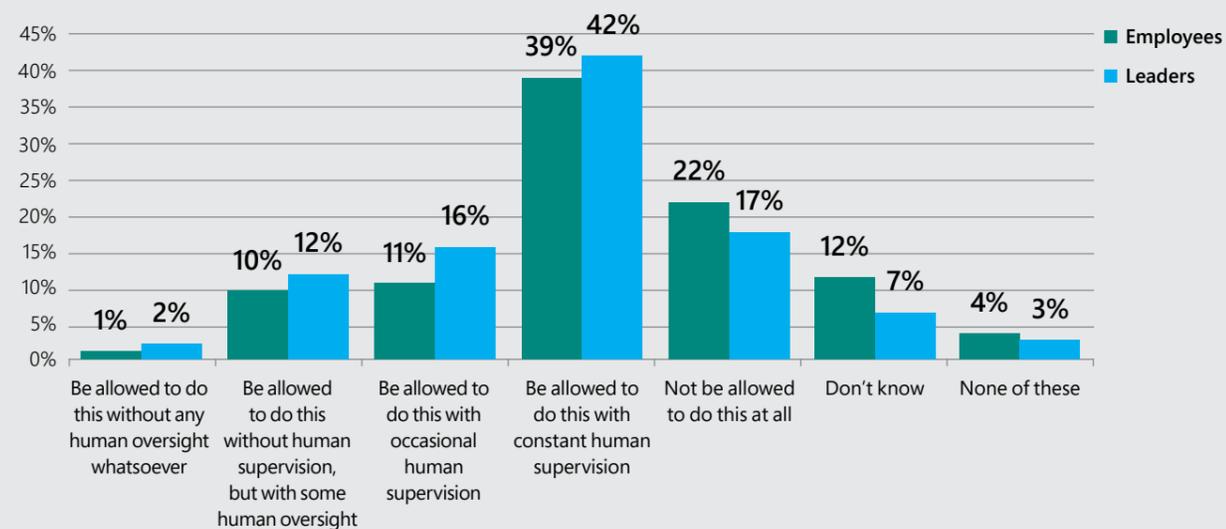
“Even though the tool itself can be 99% accurate, in medicine, the issue is about the importance of the 1% it gets wrong. What is the impact of making that mistake? Potentially a patient dies. It’s a whole different way of evaluating the tools.”

– Dr Neil Sebire, Consultant Pathologist, Chief Research Information Officer and Director of DRIVE, Great Ormond Street Hospital

Figure 14.

Supervising AI: The extent to which AI should be allowed to diagnose patients

AI systems should...



The expert view



Professor Neil Sebire

Consultant Pathologist, Chief Research Information Officer and Director of DRIVE, Great Ormond Street Hospital

“In the healthcare sector, the need to balance the constructive learning approach discussed in this report with the critical need to avoid mistakes is a very important one. After all, it is all very well to say that your Natural Language Processing tool works really well for speech to text. But what about in the high-stakes environment of the operating theatre? What about when the surgeon has got a mask on? What about when there are three or four people talking over one another? You cannot afford to get it wrong because the technology did not work, as it could be the difference between life and death.

But while AI is a transformative technology, the process to implementing it in healthcare is no different to any other changes that have happened over the years. We have been evaluating other medical interventions for the last 50 years.

For example, when a new diagnostic test is being developed, we don't just say: 'Oh, this test is quite good for meningitis, let's try it and see what happens.' There is a whole process you go through to determine the sensitivity, the specificity, how it works in different patient groups. In other words, there is a well-established approach by which to evaluate new developments. The way we go about integrating, testing, and improving AI for healthcare can and must be no different.”

What should healthcare organisations do next?

“The first step is to make sure you've invested in the right underlying platform infrastructure. This is something lots of healthcare organisations put off due to budget constraints, but until it's been done, it will be hard to get the most out of any AI investments you make. It's like buying a beautiful sign to put on the front of a building, but not investing in the sewage systems and the roads to get there.

Get robust data platforms in place, which offer the ability to carry out data deidentification, management, and analytics. This can provide you with the precise knowledge required to realise AI's true potential and transform the way your organisation treats patients and saves lives.”



Industry spotlight

AI in Manufacturing

AI has already made significant inroads into the manufacturing sector – from smart assembly robots and intelligent machine diagnostic tools, to automated warehousing, and a host of software solutions that assist in delivery logistics, inventory optimisation, and supply chain management. What is more, as the technology improves and gets more embedded, manufacturing will become more efficient, pushing up profit margins, and reducing operating costs.

Indeed, there is a clear sense of optimism for what AI can enable within

manufacturing. Our research found that 87% of the industry's leaders and employees think there is place for automation when it comes to product assembly.

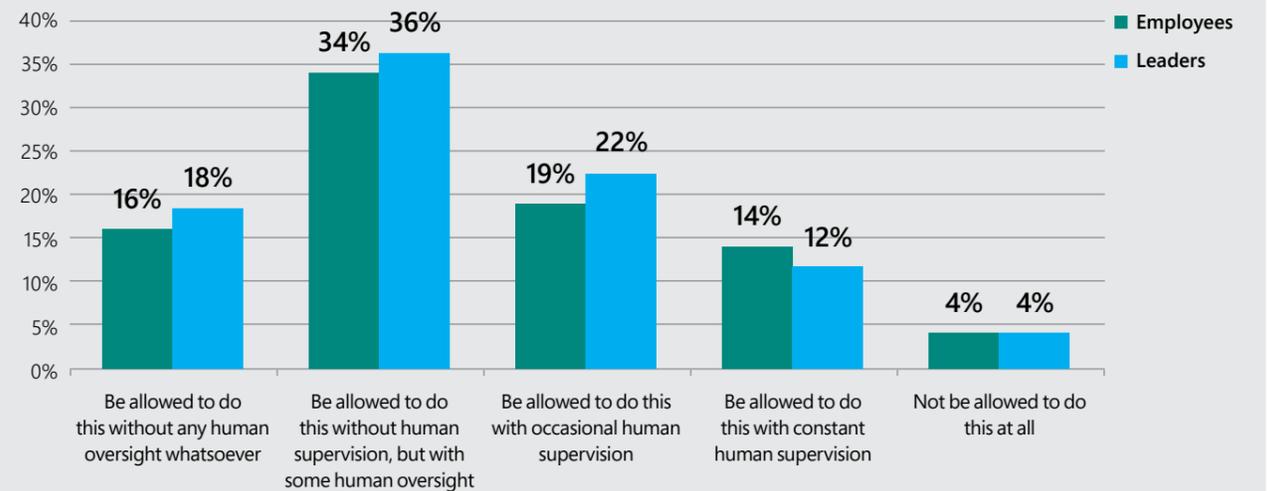
Unsurprisingly, then, manufacturing leads the way in automation, robotics, and edge computing (the use of sensors and machine-to-machine communications). However, less expected, maybe, is the sector's position at the vanguard of the use of virtual and augmented reality tools.

While this technology is in its relative infancy, 15% of organisations say they are already employing such technologies, - a figure well ahead of banking (6%), government (1%), and retail (8%). It also suggests an industry looking beyond the first generation of AI applications and considering how it can harness intelligent technology to further enhance working practices in the future.

Figure 15.

Supervising AI: The extent to which AI should be allowed to assemble products in a factory

AI systems should...



Of course, there are obstacles for manufacturers to overcome as they continue (or embark upon) their AI journey. Industrial robots remain limited in their ability to complete multiple tasks simultaneously and still require monitoring for aberrant behaviour. Meanwhile, because of the high capital investment required to enter the industry, many organisations are choosing to base themselves in countries where labour costs are low, thereby reducing the incentive to invest in AI.

Above all, though, is the issue of human and machine. Given the considerable potential to automate tasks and processes within manufacturing, nearly a third (28%) of the industry's employees report a fear that their job could be taken by AI in the future.

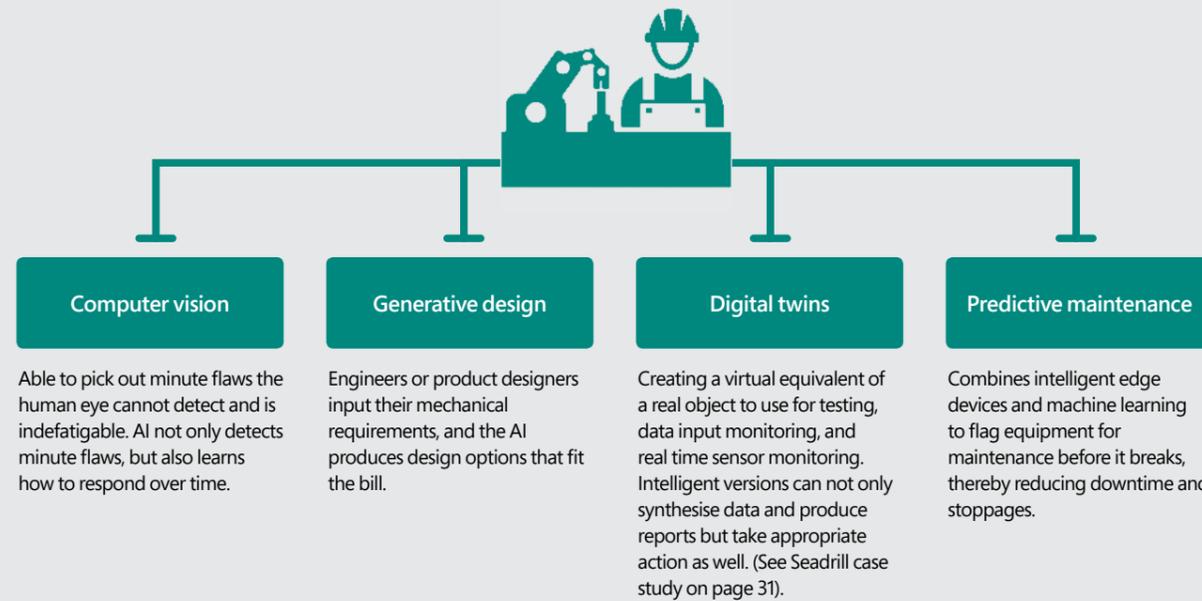
Consequently, manufacturers must consider the benefits of harnessing AI's potential in a very human context, to focus on retraining and reskilling workers alongside the introduction of new technologies to streamline and enhance operations. For manufacturers, the willingness to embrace and implement new technologies is long-ingrained. But, when it comes to what happens next, this must be a story of augmentation, not simply automation.

“We need to make AI a bit more human and talk about it in terms of functioning alongside the next generation of workers. We want to help staff understand that AI is not here to replace them or be their boss. It's here to help them.”

– Federico Bacci, Software Developer, The Manufacturing Technology Centre

Figure 16.

How AI can benefit manufacturers – now and in the future



The expert view



Mostafizur Rahman
Principal Engineer and Data scientist,
The Manufacturing Technology Centre

“The opportunity for automation is clear in manufacturing. So, for the people working in the industry, it means job roles and tasks will evolve as AI becomes more pervasive. While there is lots of talk about jobs being at risk in this sector, for me, this is a chance to use people more effectively.

Take deep learning, for example. Today there are so many time-consuming tasks, like product inspections, that are done manually. Frankly, these kinds of jobs should never have been solely carried out by a human. Deploying a technical capability like deep learning means inspections can be done really quickly, freeing people up to take on tasks where their skills are better used.

Of course, this requires a big organisational culture change, as well as a need to develop new technical skills. What I have learned from my experience at the Manufacturing Technology Centre is that it is really important to have a team with a diverse mix of skills, all of whom are empowered to use AI. While having a team of people with deep technical expertise might sound perfect on paper, they are not necessarily the right people to craft the end-product for the customer.

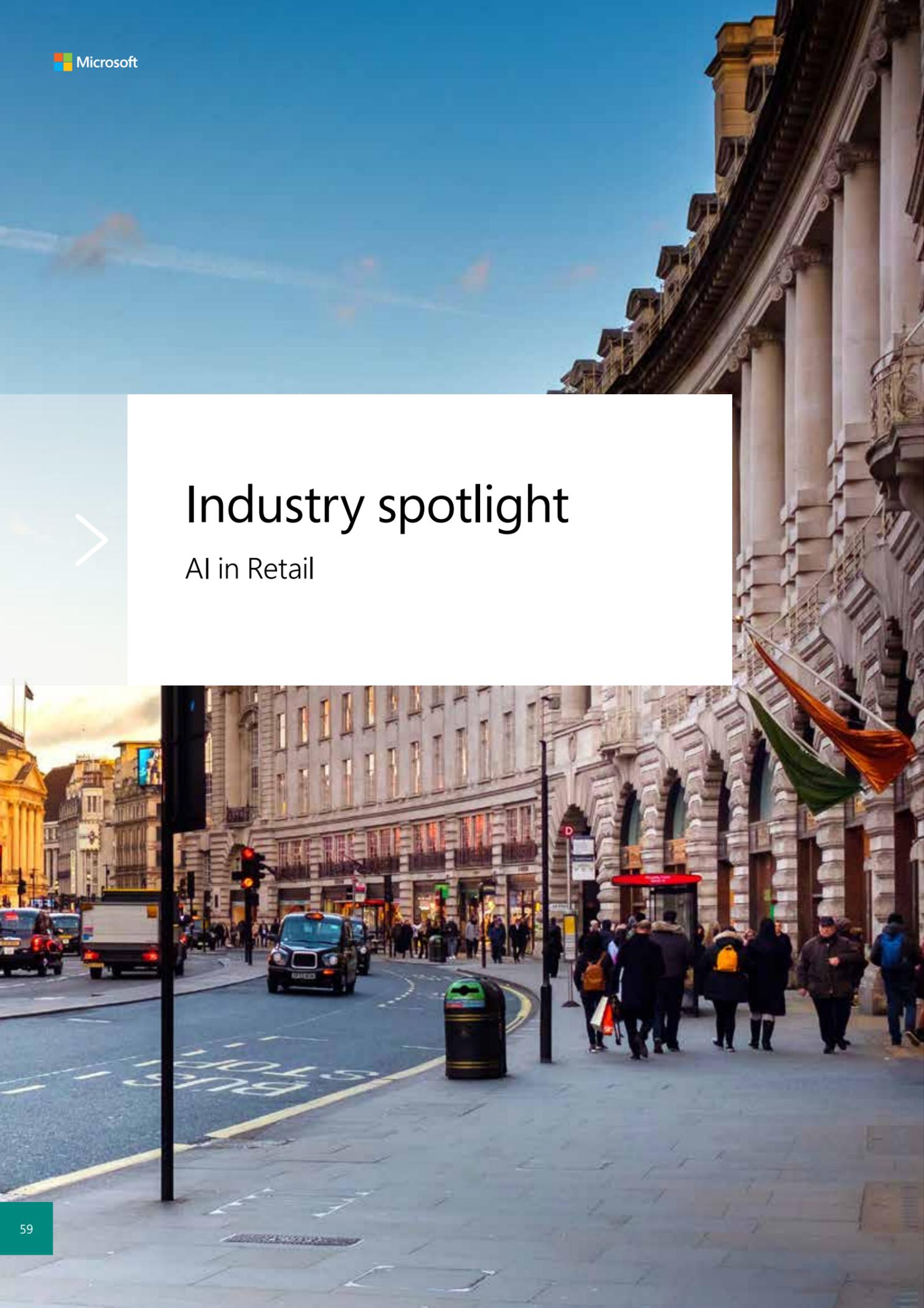
Manufacturers need both. They have to recruit people that understand how to develop and implement AI technology, then use the expertise and legacy knowledge of their existing workforce to ensure they are continuing to craft the right products for their customers.

It is all well and good having a great algorithm, but if AI is going to be baked into processes, everyone in the organisation must be able to use and understand it at a foundational level. If they do not, the result is either having products that do not meet customer needs or a workforce that cannot use AI technology. Both scenarios will see an organisation get left behind.”

What should manufacturers do next?

“The first thing to do is create a roadmap of the AI solutions you’re looking to use – and when you want to introduce them. Then start thinking about the new skills you’ll need in your workforce. That way, you can get a recruitment and training plan in place.

When training your existing staff, try to do more than just classroom-style learning. Mix in some small practical exercises, so people understand the theory but get some real experience of using AI too. We used Microsoft’s online AI school, which has practical examples and scenarios to work through – aischool.microsoft.com”



Industry spotlight

AI in Retail

AI is poised to cause seismic shifts in the retail industry – in many ways, it already is. From chatbots and personalised shopping recommendations, to automated lead generation and fraud detection, retailers have a wide range of options when it comes to harnessing AI's rich potential.

Yet, even so, two in five (39%) retail leaders say they are not currently using any AI technologies, while more than half (54%) of retail leaders believe the ability to develop new processes will be an important skill for their staff in the next five years.

Clearly, for the sector to thrive in the future, the speed of change must

increase. Yet, in fact, many experts predict adoption will remain slow, particularly in the big box retail sector due to the challenges of scaling their digital offer quickly and cost-effectively enough to compete with native online retailers.

Meanwhile, at the other end of the scale, many small businesses have misconceptions around costs and the learning curve requirements of implementing AI across their workforce and operations.

That's not to say the AI opportunity is passing the retail sector by – far from it. As we see in Figure 17 below, there are various ways in which organisations

are now benefiting from its ability to improve communications, personalise experiences, and streamline operations.

Furthermore, both employees and leaders in the industry appear comfortable with using AI with minimal human oversight for certain tasks, such as recommending items. This, in turn, frees them up for more 'human' tasks, such as face-to-face customer relationship management and staff engagement.

Of course, as with all the sectors we feature in this report, challenges for retailers remain. In lots of cases, legacy IT systems are simply not powerful enough, meaning data is fragmented and less useful than it could be.

Figure 17.

Top AI applications in retail

Sales

Using AI software to identify strong leads while automating and personalising cold calls and email introductions.

Customer experiences

Creating personalised, intuitive customer service and help portals via chatbots, personalised and automated email responses, and bespoke recommendations.

Logistics and supply chain

Using AI to analyse massive datasets and identify more efficient delivery travel routes, manage inventory flow, and predict trends.

Fraud detection

The use of AI systems to identify, alert, and prevent potential fraud during the payment process.

Add to this the fact that 42% of UK consumers say they don't like retailers to hold their personal data and 45% say they feel 'spammed' by some brands, getting their data house in order should be a priority for retailers – from both a usability and consumer trust perspective. Yet, of course, updating and consolidating these systems requires serious investment.

Similarly, traditional bricks-and-mortar retailers must find ways to access and convert their historical data into actionable intelligence to help them increase sales and reach new audiences and channels. This is causing many smaller businesses to feel unprepared to thrive in an AI-augmented marketplace – from understanding how to train and

“The EU’s General Data Protection Regulation means a lot of the hard work around getting the right data infrastructure and processes in place has been done, putting retailers right at the forefront of using AI technology.”

– Helen Dickinson, CEO, British Retail Consortium

reskill staff, to knowing how best to integrate new technologies into their operations and customer experiences.

What is clear is that change cannot be ignored. AI will impact retailers of all shapes and sizes. Indeed, according to Bob Strudwick, Chief Technology Officer at ASOS, AI is an increasingly important factor in staying competitive in the sector. “We’re working hard to become an AI-everywhere business, using it to make important contributions to how we buy, design, warehouse, and deliver our products, as well as communicate with our customers,” he explains. “Eventually, the question will be ‘where isn’t AI used?’”

The expert view



Helen Dickinson
CEO, British Retail Consortium

“The UK retail industry is going through an unprecedented period of transformation and reinvention. Digital technology is now commonplace in people’s lives and changing everything from how shoppers choose, compare, and buy large purchase items to how we do the weekly shop. Retailers are reacting to this, investing in new technologies and innovations to meet consumer expectations of the modern shopping experience.

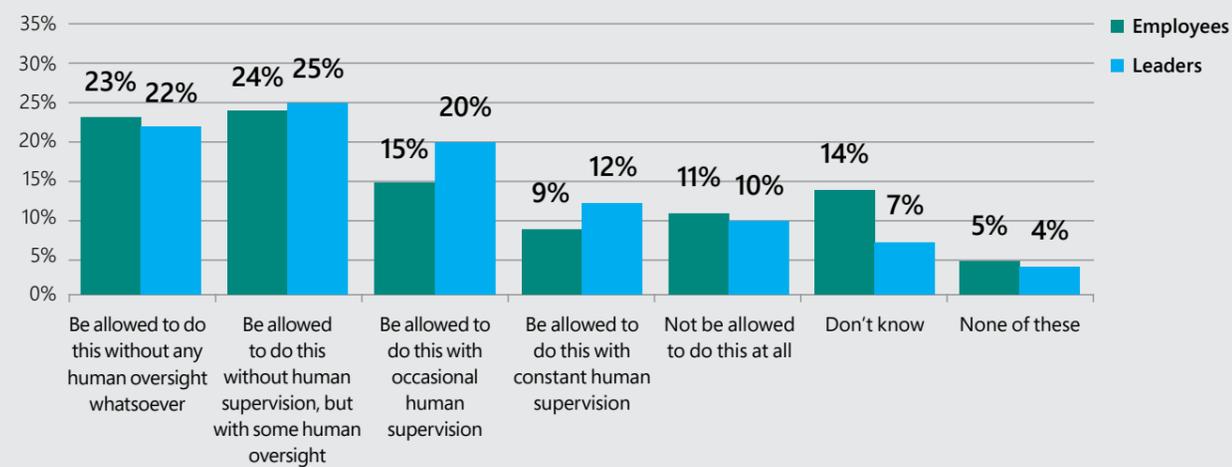
This means that UK retailers are in a great position to start embracing and benefitting from new technologies like AI. GDPR has meant that a lot of the hard work around getting the right data infrastructure and processes in place has been done, putting retailers right at the forefront of using AI technology effectively.

The challenge now is for retailers to look at their business and start mapping out where AI can help them. Whether it is in the supply chain, logistics, warehousing, customer services, a call centre, digital channels, or somewhere else, there is just so much potential.”

Figure 18.

Supervising AI: The extent to which AI should be allowed to recommend items to buy in a shop

AI systems should...



What should retailers do next?

“My advice is just make a start. Begin experimenting, learning, and refining. The reality is the world is transforming so quickly – both in terms of customer demands and evolving technology – that to thrive, retailers need to be able to change and adapt fast too.

Don't be afraid of trying new and/or different ways of doing things, regardless of what's worked in the past. Today, success is no longer about a long-term plan for exactly what the future will look like. Rather, it's about developing the agility within your organisation to move and change on the go.”

Appendix



Appendix

Methodology

This study was conducted by Microsoft in partnership with Goldsmiths, University of London and Thread in summer/autumn 2018. The process used a mixed-method approach to measure how organisations in the UK are approaching the adoption of AI.

Qualitative exploration – we used multiple research models and current understandings of the state of AI in the UK, assessed the opportunities AI affords, and generated dimensions specific to the proliferation of AI in today’s business world. These included (but were not limited to):

- Microsoft’s The Future Computed: Artificial Intelligence and its role in society
- The House of Lords’ 16 April 2018 report AI in the UK: ready, willing and able?
- PWC’s 2017 report The economic impact of artificial intelligence on the UK economy
- Professor David Autor’s work regarding AI and the future of work

Literature review – an in-depth review of academic, industry and media sources were utilised to form initial thinking, expand our hypotheses and inform us about key issues and opportunities identified in the report. From this, we developed a set of dimensions (see Appendix B) as a lens through which to consider the opportunities for AI in the UK today.

Industry expert interviews and case studies – a variety of academics, professionals and company case studies were interviewed around both the research model and the findings of this project. Quotes were analysed and used as evidence to support our hypotheses.

Barometer survey – insights from this initial phase were verified quantitatively through a barometer survey among 1,002 qualified leaders and 4,020 qualified employees, based in large enterprises (500+ employees) in the UK. The survey was conducted by YouGov. Data findings were then analysed by Thread using complex variable and single variable analysis. We used an extreme groups design to analyse our data. Our extreme group design looked at the difference in performance outcomes experienced by firms scoring very low (i.e., the bottom quartile) and very high (i.e., the top quartile) on variables describing AI adoption and AI intentions. Performance differences between extreme groups on a variable describing AI adoption suggest the variable is related to performance.

Industry experts

- Matthew Griffin, Futurist & CEO, 311 Institute
- Helen Dickinson, CEO, British Retail Consortium
- Lord Clement-Jones, Chairman of AI, House of Lords
- Florimond Houssiau PhD., Imperial College
- Shamus Rae, Head of Digital Disruption, KPMG
- Josie Young, Transformation Manager, Methods
- Brett King, Futurist and CEO, Moven
- David Gamez, Expert in AI, University of Manchester
- Pete Trainor, Co-Founder, Us AI

Customers and Case study interviewees

- Richard Tiffin, Chief Scientific Officer, Agrimetrics
- Miguel Alvarez, Director of Technology Services, AnalogFolk
- Matt Dyke, Founder & CSO, AnalogFolk
- Yuan Phoon, Technical Lead, AnalogFolk
- Bob Strudwick, Chief Technology Officer, ASOS
- Mike Young, Group Chief Information Officer, Centrica
- Louise O’Shea, CEO, Confused.com
- Rex Johnson, Business Consultant, Confused.com
- David Rendell, Web Production Assistant, Confused.com
- Prof. Neil Sebire, Consultant Pathologist, Chief Research Information Officer and Director of DRIVE, Great Ormond Street Hospital
- Mostafizur Rahman, Principal Research Engineer Data Information Systems, MTC
- Federico Bacci, Research Graduate Engineer, MTC
- Jenny Nelson, Digital Transformation Programme Manager, Newcastle City Council
- Stephen Hex, Enterprise Architect, ICT team, Newcastle City Council
- Steve Foreman, Informatics Manager, People Directorate, Newcastle City Council
- Clare Humble, Insights Manager, People Directorate, Newcastle City Council
- Isabel Sargent, Senior Innovation Research Scientist, Ordnance Survey
- Kaveh Pourteymour, Vice President and CIO, Seadrill
- Terry Walby, CEO, Thoughtonomy
- Naomi Keen, Solution Consultant, Thoughtonomy
- Neil Taylor, Technical Lead, Travel Bot, Tfl
- Lauren Sager Weinstein, Chief Data Officer, Tfl

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