



# £630bn

The DCMS has estimated that AI could add £630bn to the UK economy by 2035, increasing the GVA growth rate from 2.5 to 3.9 per cent.

# 10.3%

PWC says the UK's GDP will be 10.3 per cent higher as a result of AI, mainly as a result of product enhancements stimulating consumer demand with greater choice, increased personalisation and affordability.

# £62.4bn

IPsoft estimates UK businesses lose a combined £6.9bn on the salaries of people who are impeded or prevented from doing their jobs by IT issues; productivity hindrance and damage to brands cost billions more.

**BY THE NUMBERS**

## The potential of AI

# 1.2bn hours

Research by Deloitte found that high investment in AI in the US public sector could save up to 1.2bn person-hours by automating tasks that computers already routinely do.

# 84%

Almost all of the executives surveyed by *MIT Sloan Management Review* say AI will give their companies a competitive advantage.

# 34%

Over a third of executives told IBM they plan to push ahead with AI technology in their business.

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The paper in this magazine originates from timber that is sourced from sustainable forests, responsibly managed to strict environmental, social and economic standards. The manufacturing mills have both FSC and PEFC certification and also ISO9001 and ISO14001 accreditation.

First published as a supplement to the *New Statesman* of 22 June 2018.  
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# The power of augmented intelligence

New technology can help the public sector make better decisions, writes **Sreeram Visvanathan**, global managing director of government at IBM



**E**very company has customers that they care deeply about. Whether you are a retailer selling Italian furniture, an electronics company in China, or an oil and gas company in Canada, the customer is king. But I would argue that the most important customer-company relationship is that between a citizen and their government.

The level of trust and accountability expected from government institutions and officials is unparalleled. There is little to no room for error. There are no refunds, no exchanges of services. From deciding who crosses borders to ensuring that social services benefits go to the right person, thousands and thousands of routine and micro decisions can have a domino effect across an entire society.

In a world that is increasingly global and complex, understanding and using technology to stay ahead of the curve is no longer considered innovative, but the minimum we expect of governments.

Protect citizens and the nation; serve the needs of a changing demographic; attract business and foreign investment; provide personalised and contextualised services to businesses, citizens and visitors – these are the demands on civil servants today. Every stakeholder today expects their interactions with government to be as good, or even better than, the best that they experience in the commercial world. All this must be done with intense competition for budget and on deadline.

If this sounds familiar, perhaps it is time to reimagine your world aided by AI. Some call it artificial intelligence; I would prefer to call it augmented

intelligence. Over the last couple of years, various government agencies have been experimenting with AI but it is early days yet. So, where does one start in this era of man and machine? Which process do you pick? Here is a litmus test that one could use to identify the most appropriate application for AI:

1. Does the candidate process leverage a lot of data? Could other types of data (unstructured, open source, third party owned) bring insights and improve that process? For instance, a field commander responding to an emergency incident.

2. Is a level of personalised service required? Specifically, would details of the citizen or business change the nature of the service being provided? For instance, hyper-local services provided to a community based on its specific needs.

3. Does the process consume significant time but is mostly repetitive, requires some level of knowledge and intelligence to execute successfully? For instance, visa processing for business travellers.

One could argue that most government processes would fall into one of the above three categories, but I have found that this test allows sponsors of AI projects to compare the use cases with the most potential to deliver tangible results. As we work with our government clients on AI projects, we also see some consistent patterns that define success. It is time to see AI as a core part of a transformational project rather than a technical capability that is nice to have. Teams assigned to handle AI projects must be encouraged to challenge the status quo, the existing biases about why things are done in a certain way and must be allowed to imagine new possibilities, aided by augmented intelligence and co-creation methodologies like IBM Design Thinking.

Around the world, we are seeing a new generation of leaders who are seeing AI not as a necessary evil but as an essential catalyst to re-invention. How will you embrace AI, and discover its true potential in transforming your business and elevating your relationship with your constituents?

**Public sector bodies around the world are already reaping the rewards of investing in AI technology, writes Ian Baker, partner and vice-president at IBM Global Government Industry**

# The government AI project has already begun



**T**he promise of artificial intelligence is no longer a nebulous concept on the horizon. The private sector is already exploiting its possibilities, and governments are following suit. We use the broad term “AI” to refer to computers simulating human abilities and performing tasks that people typically do, using technologies such as cognitive computing, predictive analytics, robotic process automation and machine learning.

AI represents a significant economic opportunity for the United Kingdom. Recent research by IBM and the Confederation of British Industry found that around 20 per cent of British firms have already deployed AI in practical applications. In March, Emmanuel Macron laid out his plan for French leadership in AI, which included a pledge to invest €1.5bn of public funds. Since then, 25 European countries have signed a Declaration of Co-operation on the most important issues raised by AI. Most recently, the House of Lords has published its view on how the UK can be best placed to take advantage of AI.

Used in government, AI can also stand

for “augmented intelligence” – giving employees the ability to make more informed decisions.

The earliest successes of AI adoption in government have happened in the US. Citizenship and Immigration Services now uses an AI-based online virtual assistant to answer questions from citizens and immigrants, while the Intelligence Advanced Research Projects Activity has tapped the technology to improve facial recognition. Other agencies are testing whether AI can improve purchasing processes or relieve employees of tedious work. A recent survey found that 77 per cent of US Federal managers said their agencies will need to deploy AI over the next five years “to keep up with the increasing pace of work”.

As government agencies around the world start to adopt AI, a number of repeatable use cases have started to emerge. The overwhelming majority of the world’s data – an estimated 80 per cent – is held in formats not easily used prior to the emergence of AI. This data may be held as unstructured documents, both electronic and hard copy, as video

or audio. AI can analyse these files, recognising the content of images, videos and text, and then help people to understand them and use them to make informed decisions.

Machine learning systems improve over time, building better simulations with the more data they are given. Alexander Measure, economist at the Bureau of Labor Statistics in the US, called the possible applications of this technology in government “too many to list,” but the wide range of activities, he says, can include everything “from analysing satellite images to processing Social Security disability claims.”

## How governments are using AI

Across public sector organisations, a number of very different agencies – both defence and civilian, and in local government and academia – are using AI technology to transform their work.

The cases presented here describe both works in progress and end results. Other agencies can learn and benefit from these organisations’ early experiences, particularly if these first stages end up



being a springboard to significant shifts in agency practices.

#### **...for a safer world**

Law enforcement agencies use, or plan to use, AI to outsmart criminals. Several US law enforcement agencies, as well as wildlife rangers in two other countries, have used AI to plan their patrol routes to guard against terrorism and poaching. In addition, recent advances in video analytics that can interpret facial sentiment and bodily disposition are adding enhanced security capabilities to border agencies.

#### **...for improved service**

Agencies such as the US Bureau of Labor Statistics at the Labor Department are looking at AI to assist staff through taking away tedious, repetitive tasks from employees and save hundreds, even thousands of work hours. Employee time can then be redirected to more important tasks. Similar organisations are looking at AI in speeding the assessment of benefits eligibility, resulting in faster citizen satisfaction and ensuring that

incidences of missed or improper payments are reduced.

Tax and customs agencies are looking to AI to identify instances of tax evasion, by the analysis and interpretation of many different unstructured sources of data.

#### **...for social benefit**

AI can also help break down government silos, analysing disparate data sources from different agencies to serve citizens and protect vulnerable populations. Child welfare agencies are using AI to help identify children at risk, and to recommend interventions to prevent abuse. One Kansas county is using the technology to identify substance abusers at risk of arrest, and to get people in these at-risk groups into county services before they break the law.

#### **...to reduce facilities cost**

Government agencies with large land estates, along with many private-sector counterparts, are starting to use AI in asset and facilities management to predict failures of critical equipment and maintain them before they fail. For defence and intelligence agencies, too, predictive maintenance can help ensure mission readiness, safety and agility of response.

#### **...for education**

The education community is looking to AI to help students find out about services. A leading university is using AI technology to better provide students with access to information on benefits and where to get help from social services.

#### **...for better value for money**

The US Air Force plans to use AI technology to make sense of complex acquisition regulations, so that it can speed the process of buying goods and services. Doing so could open government procurement to more small businesses and companies that have previously avoided working with government agencies because the acquisitions process has been too difficult to navigate.

#### **...for policy decisions and legislative guidance**

The ability of AI to navigate mountains of existing legislation, rules, regulations, ordinances, and to determine the impact of change in legislation on other parts of government, has increasing relevance in a world where the public demands clear action in complex cases. This ability to analyse unstructured data, in conjunction with prevailing legal frameworks, can have equal applicability in determining if a legal case will stand effective prosecution.

#### **...for happy citizens**

AI already plays an increasing role in everyday life – citizens now interact with chatbots as a matter of course. In the public sector, this can be effective in both citizen helpdesks and IT call centres, providing the user with access to insights and expertise derived from the most experienced and knowledgeable employees, and delivering that advice in a way that is easy to understand. In Australia, AI is being used in conjunction with an avatar of a real person to enable citizens with physical and cognitive disabilities to access key benefit services.

#### **Trust remains a key factor**

AI is progressing well, with more solutions on the way to help people find smarter ways to live and work in a world where big data is a new natural resource.

But to fully reap the benefits of AI, society must trust it. This trust must be earned through transparency, and through repeated experience. In the same way that people learned to trust that an ATM will register a deposit or that a car will stop when the brake is applied, AI must prove itself a reliable and useful technology.

Government has a role to play here, to ensure that use of AI goes hand-in-hand with the principles that ensure trust in both the technology itself and in the handling of sensitive citizen data. AI systems must be accountable, and developed with the capability to explain their decisions. With responsible handling, AI can be a powerful tool.

# Building the ultimate customer advisor

**Adam Shardlow, journey lead in AI, help and support at RBS digital, personal and business banking, explains the value AI has already created for RBS customers**



**T**here will always be room for human support in customer services, but at RBS we have websites containing pages of product materials and multiple contact channels and that proliferation of information can be bewildering, particularly when banks use their own specialised terminology. Our customers want to find answers to their questions quickly, whilst using their own language for understanding.

Our answer is an AI chatbot called Cora. Banking has been a bit slow on the uptake with AI, but it is making quick gains. I head up a programme working with IBM on a customer-facing chatbot that's available in our digital channels. We utilise IBM Watson's natural language processing capability to understand what our customers are asking us, answer their questions and give them the information they need to complete their journey.

The majority of our customers have simple questions to which they want a quick answer, and the number of customer enquiries Cora can resolve first time is now well into double digits. That removes a glut of easy questions from our frontline staff, giving them more time to concentrate on those customers with more complex questions.

One of the great benefits of using AI is that it learns all the time. My team spends a lot of time looking at conversations to see where they have gone well, not so well, or where they've been phrased in a way that Cora hasn't

understood. This human-led approach means we can maintain quality and consistency in our responses but also means the older "waterfall" method of design – getting everything signed off, building something and releasing it to customers in one go – is no longer applicable.

I've been very pleased to see how customers have embraced Cora. We tell them very early in the process that they are talking to an AI, but already we find customers talk to Cora as if she were an individual. They say hello, and thank you, even asking Cora how she is feeling today.

One of the benefits of using AI in a large organisation is that we have teams across the bank in telephony, web chat and messaging and the data on why customers are contacting us has traditionally been held in silo. Cora allows us to access this data and understand our customer's needs better.

Solutions that utilise human conversation are not an easy undertaking, and it's not something any organisation is going to build quickly. We decided to work with a third party that had been operating in this area for years, and had acknowledged expertise. At the same time, IBM has told us that we've challenged their framework for financial services. We're very much in a partnership.

Unless you're a company that has developed its own AI, you need to work with third parties and build fast. But you also need to develop a process in which you do things by iteration, involving your customers in the design process. Technology is successful if it's human-centred. Digitisation is happening fast, and AI assists in applying solutions to complex questions; the best customer-facing solutions use a manner suited to how humans think in the first place, which for Cora is using the language of conversation.

*Adam Shardlow is lead journey manager for customer facing AI at RBS Digital and creative director of thinkpiece.info.*

# A responsible AI revolution can benefit us all

**Minister for digital and the creative industries**  
**Margot James says AI offers huge opportunities for social and economic development in the UK**



**T**he potential to drive UK economic growth through the deployment of AI is massive. The journey we're on will be full of opportunity, and we want to establish the UK as the go-to destination for AI, and to realise the social, economic and productivity benefits of AI and data technologies. But people and skills are at the heart of the industrial strategy, and the AI and Data Grand Challenge is focused on creating jobs and greater earning power for people across the UK.

The Industrial Strategy, and the AI sector deal within that, should help, working through schools, university and industry to ensure a highly skilled workforce. The things the government is doing to support that endeavour include supporting the Turing Institute's plans for expansion to become the national academic institute for AI and data science; building an additional 200 doctoral studentships in AI and related disciplines by 2020-21, and 200 per year thereafter; investing £406m in maths, digital and technical education, which includes the upskilling of 8,000 computer science teachers; and working with industry to set up a new national centre for computing education.

A lot of people now graduating will have many facets to their career, and it's important we commit to lifelong learning in technical skills as well as leadership, communication, creative and teamwork skills. As part of our digital strategy, we've established a digital skills partnership that brings together businesses, communities and educators to improve the digital skills required for an inclusive digital economy. This isn't

specific to AI, but I feel the AI revolution has huge potential to close a lot of gaps in our society – in income, society and education, particularly digital education. We want to make effective use of data to analyse those gaps – between old and young, between rich and poor, between people at the cutting edge of industry and people in the more traditional sectors – to ensure that training opportunities are targeted towards the needs of individuals, organisations and communities, as well as for the greater benefit of productivity. This means investing in improving access to and use of data.

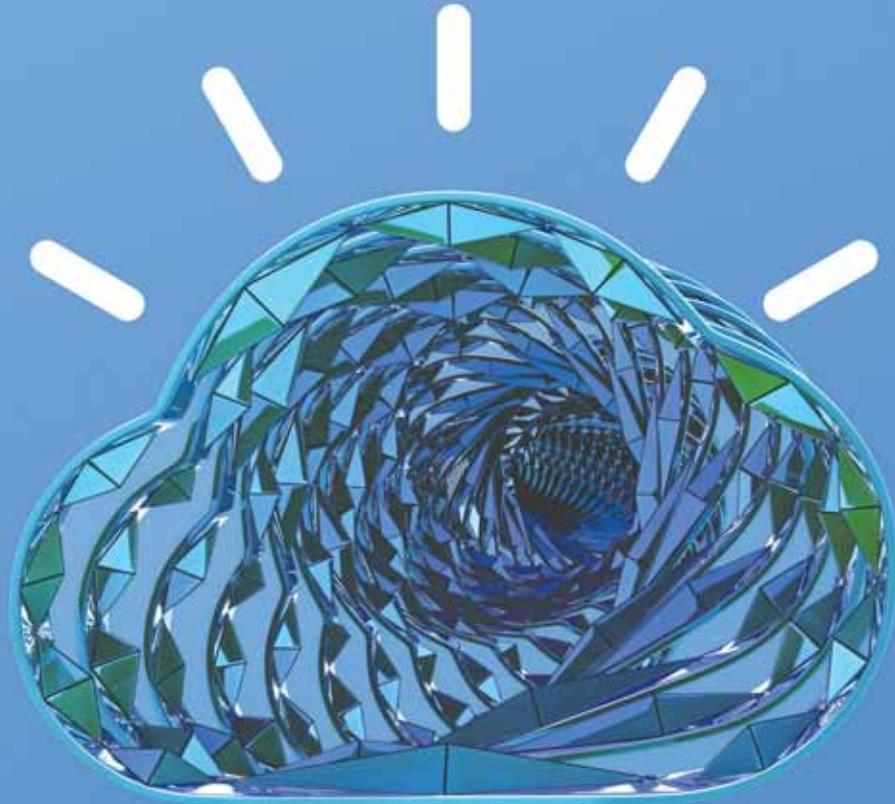
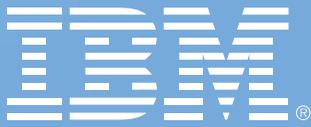
Data is the big enabler of AI, and the AI sector deal sets out our commitment to ensure that the UK has the right digital infrastructure, and, crucially, data infrastructure. We're working at the moment on a government data strategy, and we're investing over £1bn to create a country with world-class digital capabilities, from 5G mobile networks to full-fibre broadband. The government and public bodies are already leading the way on making public datasets open and available, but there remain significant challenges to sharing some private and public sector databases securely and responsibly. So we will explore and develop new data-sharing frameworks, such as data trusts, as part of our work to ensure we can unlock the power of data whilst respecting the privacy and other aspects of how that data is used.

It is crucial that we build ethics into the AI revolution, from the ground up, which is why we're creating what we hope will be a world-first centre for data ethics and innovation. It will advise government and other bodies on the measures needed to enable and ensure safe, ethical innovation in AI and data-driven technologies.

We have some of the best minds, the best companies and the best universities in the world, and we are committed to partnering with citizens and organisations to make sure that we can achieve together all the benefits that AI offers.

*This article is the text of a speech given by Margot James at an event hosted by the Resolution Foundation on 22 May 2018.*

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