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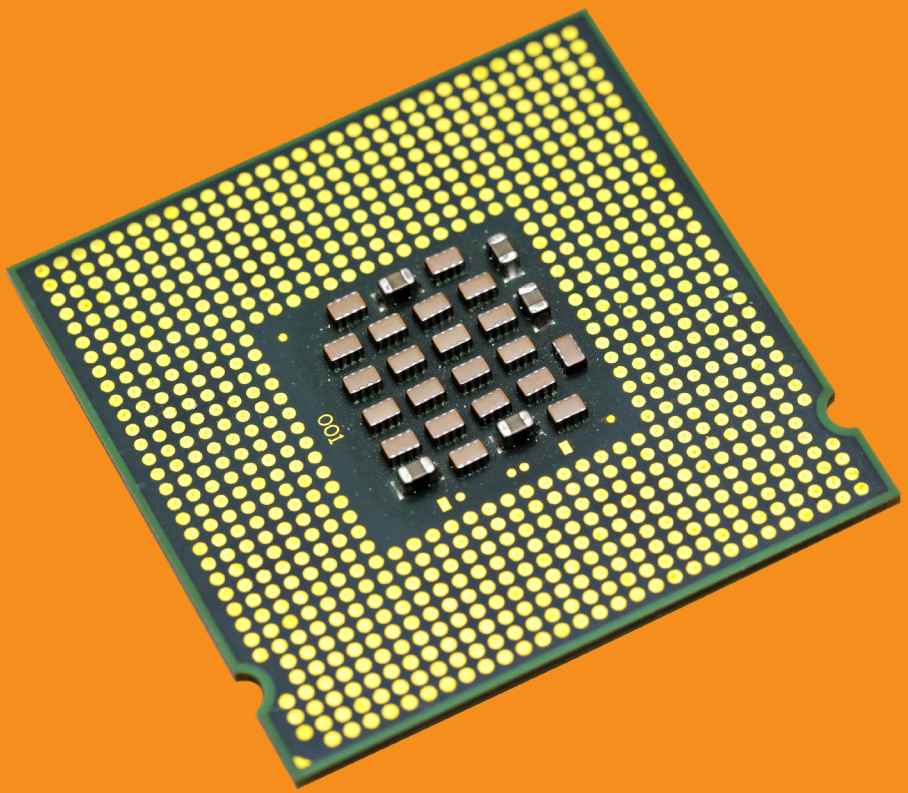
Industry perspectives on the opportunities and challenges of AI



Artificial Intelligence

In June 2018, a number of senior figures from the insurance industry gathered for a round-table at the CMS offices to discuss the ethical and regulatory implications of the use of artificial intelligence (AI) in the sector. In this report, we highlight the themes that emerged, and how participants feel the industry is responding to the challenges and opportunities that AI brings.

AI may be revolutionising many industries but the insurance sector has generally been a slower adopter of the new technology. However, this is starting to change, with numerous InsurTech companies emerging, and insurers and brokers investing in technology and technology companies. It is not hard to understand why. With customers demanding more information, more flexible products, efficient claims handling and the ability to make insurance decisions in a matter of minutes from smart devices, there are significant opportunities for insurance within the world of AI.

However, with excitement comes risk and when deploying AI there are a host of issues to consider for individuals, companies, policy makers, and regulators. Just because something can be automated does not necessarily mean it should be. Is it possible for software designers dreaming up new AI solutions to ensure the data used is free of human bias? Should the use of AI in regulated businesses such as insurance be regulated/authorised and, if so, how can regulators effectively monitor such AI and who will be responsible if it goes wrong? This report explores these issues.

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The opportunity for AI in insurance

The enormous advancement in computing power and the exponential growth of huge data sets are two key drivers in AI. This presents a substantial opportunity for data-heavy businesses like insurance. AI has the capability to spot correlations in data that are not visible to the human eye and the more people work with AI, the more potential opportunities and benefits will emerge.

The adoption of AI in insurance has been much slower than in other industries. *'Only 1.3 per cent of insurance companies invested in AI in 2016',* according to Deloitte, and the sector clearly lags behind the banking and asset management industries. This is despite the fact that AI has the potential to help drive down costs, reduce fraud, increase efficiency, improve the personalisation of products and do away with lots of complex computer systems that do not talk to each other.

There are some examples, however, of AI being used successfully within the insurance sector. For example, '*chatbots*' carrying out customer service or AI '*sentiment detection*' identifying unhappy customers on Twitter. The growing use of AI in smart cars and homes is also providing a wealth of information that means the insurance market is moving from a reactive market to a '*prevent and mitigate*' one, responding to disasters as, or before, they happen. AI is already being increasingly used in insurance underwriting while the potential of the use of drones in disaster recovery situations may eventually reduce the need for traditional loss adjusters.

> In a highly competitive sector, AI offers a real opportunity to steal a march on rivals, which is an important and pressing consideration when you have disruptors such as Amazon preparing to enter the general insurance sector.
>
> *Alan Nelson,*
> *Managing Partner, CMS Glasgow*

1.3% **Only 1.3 per cent of insurance companies invested in AI in 2016, according to Deloitte.**

Is AI a force for good?

Whether it is to do with assisting with medical diagnoses, deployment of drones and other intelligent systems to mitigate the threat of terrorism, conducting scientific research or optimising the use of data analytics, there are so many ways that AI will change things positively for humankind, including some that we do not even know about yet. However, we have to consider the consequences and the ethical principles upon which these systems are created. It is too late to start to think about that *after* the design and deployment of the AI.

The ethical principles for AI are no different to the everyday principles of business such as transparency, accountability, fairness and acting with integrity. When it comes to AI, a primary question for business has to be - just because we c*an* automate something, should we? If the answer is 'yes, we will automate a process and develop an AI system', then it becomes critically important to embed the company's values and ethical standards into the design of the AI right from the start.

> I firmly believe artificial intelligence is a force for good. It is here to stay, and will make our lives richer by enabling humankind to continue to evolve and prosper. That potential comes with risks, however, and what I am concerned about as an ethicist is that we are at a critical tipping point right now about how we manage those risks on an ethical basis. How do we ensure AI will *enable* us to flourish economically, environmentally and socially, and not *disable* us?
>
> *Tracey Groves, specialist adviser in corporate governance, trust, and AI ethics, Intelligent Ethics*

The House of Lords' Select Committee on AI published a set of five ethical principles for AI in April 2018 which are an excellent starting point for ethical consideration:

- AI must be a force for good and for the benefit of humanity, incorporating the principles of inclusion and diversity in the widest possible way;
- AI must operate on the principles of fairness and intelligibility. Someone may not understand how AI works, but it must be explainable and there must be safeguards in place to regulate its use;
- AI should not be used to diminish the personal data protection rights or privacy of individuals, families or wider communities as well. Always ask the question, 'What is the AI being used for and is there any harm being done that is not in line with the intention?';
- All citizens have a right to be educated about AI to enable them to flourish mentally, emotionally and economically. For example, currently, the RSA is running a series of citizen juries on the ethical use of AI as part of a wider programme on Digital Transformation including AI and the use of intelligent machines. They believe that all citizens have a right to have a voice, to understand the technology and have access to education to help to dispel many of the negative misconceptions around it;
- The autonomous power to hurt, destroy or deceive human beings should never be vested in artificial intelligence. In other words, no 'killer robots'!

> In short, when thinking about AI and ethics, whether in the insurance industry or otherwise, the best analogy to use is that this is about Dr Frankenstein, and not his monster. This is not about AI being ethical, per se. This is more about how we as human beings are responsible for the ethical design and execution of AI. And the importance of this should not be underestimated.
>
> *Tracey Groves, Intelligent Ethics*

How do we regulate AI?

Regulators have statutory objectives to ensure an appropriate degree of protection for consumers and to promote and enhance the integrity of the financial markets in the UK. They also have to foster competition while instilling ethical behaviour within industry and encouraging innovation, technology and change.

It is a big and complex task and, given the rapid pace of change in AI and machine learning technologies, the challenge that regulators such as the PRA and FCA face now, is determining the appropriate degree of regulation. Industry needs to try to help regulators define what is appropriate. How else will a regulator be able to understand how best to ensure consumers are protected when some of the change on the horizon is immense and could be introduced very rapidly?

Regulators are already trying to meet and respond to this challenge. Through Project Innovate, which the FCA has been running since 2014, people and companies are encouraged to create new services and solutions that enhance competition and provide consumers with more choice. A regulatory sandbox has been established where companies can test ideas in a controlled environment but in a way where they will not be penalised quite so hard if anything goes wrong. Firms, from established banks to start-ups, have already tested out solutions in the sandbox. While there have not been that many insurance firms applying in the past, in the last sandbox intake in December 2017 there were three insurance-related firms testing technologies around handling claims and assessing risk.

One area where regulators are lagging behind is that the current rules were not designed with emerging technology or automated solutions in mind. Many of the rules and concepts have been there for years and they have not been refined for how life works now or in the future. We find that clients interested in taking the next step in using AI technology are struggling to work out exactly what they need to do to meet the regulators' expectations. For example, what are the precise requirements around the suitability of advice from robo-advice solutions? More generically, what systems and controls need to be in place and how carefully do inputs and outputs of any AI solution need to be monitored? This uncertainty about regulatory requirements is likely restricting what clients in the insurance industry could be doing within the field of AI.

> But who and what will be regulated – companies and senior boardroom executives or the software engineers and AI scientists creating the new solutions? Should software engineers become FCA 'approved persons' authorised to carry out controlled functions for a company?
>
> *Tracey Groves, Intelligent Ethics*

At the moment, when it comes to regulation in the insurance sector, there are high-level principles, such as acting with integrity and treating customers fairly, and a requirement for systems and controls to be in place to ensure that regulatory obligations are met.

There are also detailed conduct of business rules. This is all backed up by a senior managers' regime that tries to hold individuals responsible and an ombudsman that makes decisions based on what was fair and reasonable in the circumstances, rather than an analysis of legal obligations.

The senior managers' regime brings quite a high degree of regulatory risk, including personal risk for top managers, and that is only going to increase. Responsibility for each part of a business now has to be apportioned to an individual and if something goes wrong, the individual could potentially be fined or banned. This makes individuals cautious, rightly or wrongly.

Those risks are only amplified in the world of AI, machine learning and automation generally. If you take the human element out of any process, if anything goes wrong it is not just one customer that is affected, it could be thousands. And what if a machine learns something different than expected from the data inputs, how should that be regulated?

Regulators are not unaware of the challenge they face – the FCA has an insight paper highlighting how a chatbot was famously shut down after 16 hours after it learnt to become racist and sexist, reflecting how bias can be introduced from an algorithms' data. Regulators have to consider if algorithms can have baked-in bias when making decisions which can harm consumers or harm competition. For example, if all machines learn in the same way, using the same data, could that lead to illegal price fixing in a sector? And what should company and individual accountability look like with proprietary algorithms trained on biased data sets?

The FCA understands the challenges but it is not moving quickly when it comes to addressing them or providing answers for industry. In the short term, it is unlikely the FCA will introduce new rules for different financial services delivery mechanisms. For example, regulators are not going to change their focus on outcomes, whether it is face-to-face or robo-advice. Over time, however, regulators might start to place a greater focus on the individuals responsible for implementing those AI solutions and there may have to be a senior manager who is accountable for ensuring AI works in a fair way.

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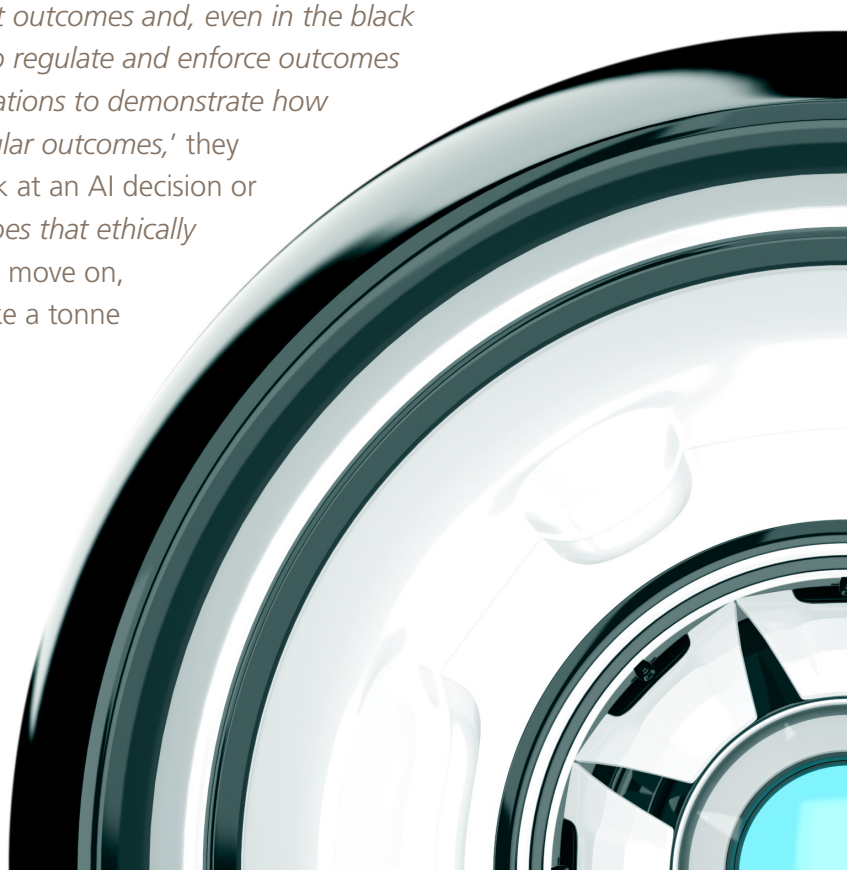
One participant said they did not expect to see a significant shift in regulators' approach when it comes to monitoring AI solutions. *'At the moment the regulator looks at outcomes and, even in the black box world of AI, it will still want to regulate and enforce outcomes so the pressure will be on organisations to demonstrate how their AI solutions arrived at particular outcomes,'* they explain. 'I think regulators will look at an AI decision or outcome and ask the question '*Does that ethically look right?*' and if it does they will move on, but if not, they will come down like a tonne of bricks.'



Can human bias be programmed out of AI?

It is widely known that some police forces have trialled AI technology to identify, for example, the likelihood of reoffending, and test cases have shown that the systems start to demonstrate unacceptable levels of bias in their outcomes. This is only one of a number of examples where human cognitive bias can negatively influence AI and machine-learning technologies.

> The problem is, with AI, you want to use as much data as possible, but if you are using historical datasets that have historical biases, then that bias will be carried forward again through the AI system.
>
> *Participant, major international insurer*

One participant argues that when human mistakes and bias become '*baked into*' AI solutions, it simply perpetuates flawed observations inside of a black box, adding: '*We need to find a way to programme against cognitive bias and we haven't been able to do that in people so best of luck trying to do that with machines.*'

However, there are examples when AI can not only reduce or remove bias but can help with more open-minded thinking than humans could possibly achieve. Charles Kerrigan, a partner at CMS, uses the example of a doctor who has seen nine patients with flu. He or she might then diagnose the tenth patient, presenting with similar characteristics, as having flu. This is known as confirmation bias where a person makes a decision that confirms a previous belief. However an AI system can take into account a patient's symptoms and medical history and compare it against thousands of known diseases and other factors. The system may still diagnose flu or it may suggest some other illness. AI systems using a much broader medical data set are less influenced by bias and can be a beneficial help to doctors when diagnosing patients.

Tracey Groves at Intelligent Ethics says bias is a major concern in the field of AI, which is why it is important to monitor the diversity of the input into the design of a programme as well as the fairness, accuracy and intelligibility of the '*outputs*'. '*Ethical considerations mean you have to look at what harm AI is doing, as well as what good it is doing, and what purpose it serves. It is not possible to assess the risk in a binary way – it has to be assessed in the round, looking at the design principles, inputs, and outcomes.*' She adds that there also has to be continuous monitoring and evaluation of AI systems as part of a robust governance framework: '*We have to be one step ahead: testing the outcomes and assessing the impact of AI on an inclusive basis against a whole range of stakeholders, so that we can properly inform the design and ethical use of it - and we have to do that before it becomes too late.*'

> No matter what question you are asking and in what context, I think all roads lead back to who is designing the AI. If you don't have a diverse and inclusive array of people designing this stuff, it will create problems.

Do boardroom executives in the insurance industry today even understand artificial intelligence?

Explaining how an AI system works and, more importantly, understanding what happened when something does go wrong will be a key focus area for corporate boardrooms going forward. Alan Nelson, a partner at CMS, says: *'This is one of the key issues at boardroom level right across the financial services sector. Are companies delivering something that they don't understand? If a board does not understand a company's AI or cyber security, are they actually suited to manage it?'*

This is not only something that matters to the customers that a company serves, but also to regulators.

'*The difficulty comes when you don't understand or you can't articulate what your AI is doing to a customer, or to a board, or to a regulator. If you can't explain it to the regulator there will be a problem if you have to get your model passed.*'

Participants felt that this is a live issue for all businesses, particularly regulated ones, to consider: '*Would I be comfortable signing off the risk of an AI model that I didn't completely understand, or that someone could not explain to me? I am not sure. In a boardroom you can challenge someone and ask them to explain why they did something, but how do you challenge an AI model?*'

The risk for companies if they cannot understand or articulate AI is that they may not only face greater regulation in the future, but will be less equipped to help inform the regulatory debate. Mr Nelson says: '*The FCA didn't regulate the cloud for a few years and then it put out guidance, which it said would encourage innovation but, if you read the guidance, things are much harder now. This will likely happen with AI in the financial services sector.*'

Will we all lose our jobs to artificial intelligence?

Fears of computers taking over and causing job losses is one of the main concerns, certainly among the general public, about the recent exponential growth of AI and automated solutions. Companies, policy makers, regulators and institutions will need to respond to that concern and consider how we retrain humans to do new jobs in a world of AI.

Whether everyone will become a data scientist remains to be seen, but what is quite clear is that companies in every sector are looking at how AI can help better direct resources and manpower in a profitable way. The company of one participant has set up an innovation team within its customer lab to conduct small-scale pilots of technology. Another says: '*We have a full-time AI development team of seven individuals in the US but they are primarily looking at back-office solutions, such as in the IT and human resources sphere, initially. We are focusing more internally before rolling any AI solutions out to customers.*'

One participant says: '*I need to know where I direct my human resource and AI might be able to help us do that better. We are just about to do a proof of concept for risk in my team using it [AI] for modelling. We are aware there are managed and unmanaged tools that can take structured and unstructured data and use AI to come up with conclusions on the back of it. That could reduce the length of time it takes us to do things, but it could ultimately reduce the need for actuaries.*'

Artificial intelligence is unlikely ever to completely remove the need for humans. In insurance, even companies with autonomous pricing processes will still have a chief actuarial officer who is ultimately responsible for that pricing. Nor is it likely that insurers and other large institutions will start delegating decisions about asset management, at least not yet. '*AI making decisions about our investments would be a big jump. Using it as a validation tool to find a needle in the haystack is one thing, but using AI to automate the process of portfolio optimisations is a different thing altogether. I still question if we would ever get comfortable with letting a computer optimise £X billion of assets.*'

Charles Kerrigan, a partner at CMS, says history shows that new employment opportunities have always materialised even with the introduction of disruptive new technology: '*No one's grandma was a 'brand consultant' but that is how the jobs markets evolve.*'

> People sometimes forget that AI has been around for a long time. It just used to be known as computational statistics, which is a less sexy term than AI. I don't think all jobs will be got rid of; I just think we will all become data scientists.

Conclusion

It is no exaggeration to say that AI is going to transform both business and life as we know it. Although the insurance industry may have only just started to dip its toes into the field of AI and machine learning, it is expected to ramp up its involvement in the coming decades. After all, it is hard, and often futile, to fight against technological change. It could also be foolhardy at a time when Amazon, the American internet giant, has expressed an interest in entering the general insurance sector.

However, change does not have to mean abandoning corporate values and ethical considerations around transparency, fairness, accountability, responsibility and trust. Tracey Groves, a specialist adviser in corporate governance, trust, and AI ethics at Intelligent Ethics, says the government's recently launched Centre for Data Ethics and Innovation has kick-started a consultation to determine how the UK government, academic institutions and corporations can agree and articulate a code of best practice for AI: *'This is a real opportunity for all of us to get involved in the debate.'*

The UK government wants a best practice code that can help guide ethical and innovative uses of data and analysis. It wants to be the world leader in AI technology and advancement and Prime Minister Theresa May said as much in January when she addressed world leaders at the World Economic Forum in Davos.

For business, AI should be embraced and developed but integrated into business's ethical ecosystem from conception. And if AI can deliver better solutions with enhanced outcomes, then there is no reason it should not be accepted by regulators.

'*We need to embrace AI as an integral and fundamental part of our values and belief system.*' asserts Ms Groves. '*We always have to answer the following question – is this AI solution aligned with what we stand for, and more importantly, does it pass the humanity test?*'

> For me the real excitement for the insurance industry is that it has always had to work off a sample of data, but now it has real data to work with in Artificial Intelligence (AI). Just think of the potential with driving claims, not only can insurers know in detail how people drive but they can assess who they were with, where they were driving, and what they were doing before and after an accident. The industry can look at the risk in a completely different way.
>
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