TRANSFORMATION – DIGITALISATION

# Artificial Intelligence & Machine Learning

Artificial intelligence and in particular machine learning are dramatically transforming and enhancing the capabilities of computers and robots in ways that could not have been anticipated even 15 years ago. It is difficult to overstate the technological revolution which we are now going through. But what is at the heart of this technology – and what makes it so transformational?

Start

# An overview of the technology

Though often unaware of it, we are now all making use of AI and machine learning systems in our everyday lives: web search engines; online language translation; voice-activated 'assistants' such as Alexa & Siri; predictive text on your mobile; auto-tagging of photographs uploaded to social media sites; suggestions for music based on your listening habits. AI and machine learning systems can already out-perform human experts in such diverse areas as identification of malignant melanomas, spotting the faces of criminals in crowds, and prediction of judgments in human rights cases.

One of the worst mistakes that we can make is to assume that AI and machine learning can be treated just like any other technology. Sleepwalking into transactional and procurement decisions which would be safe and work with traditional information technologies might cost dearly in terms of risk and expense downstream. Or – just as serious – in missed opportunities.

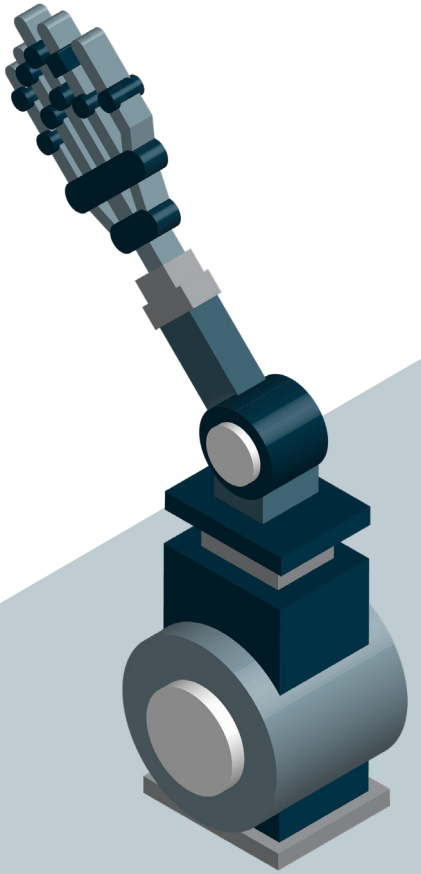
So what, at a very high level, are the key features to be aware of?

# Strong AI or Weak AI?

The term “artificial intelligence” reflects our somewhat unhelpful anthropomorphic thinking around the technology and requires clarification. We are some way off the creation of a truly intelligent machine, that in technical terms demonstrates “Strong AI” – that is, the ability to perceive, think and understand, and then to apply that to a range of disparate tasks. Sentience is still a product of our evolution and our upbringing and is part and parcel of our essence as living human beings.

What technology has provided us with is “Weak AI” – that is to say machines which are very capable of specifically directed and applied tasks. AI is in effect the combination of an ensemble of complementary technologies including, for example, machine learning, decision trees and fuzzy logic to achieve these ends – whether it is automated facial recognition, natural language processing or applied predictive reasoning.

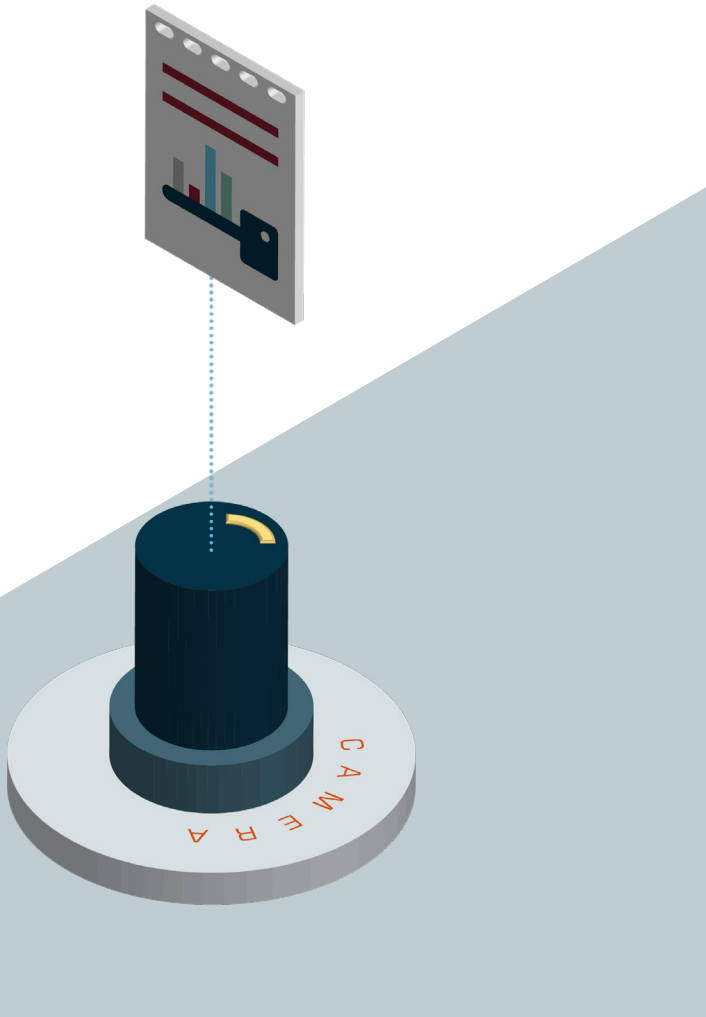
Directed at a clearly defined objective; weak AI can nevertheless be very powerful. Some AI systems, known as “general purpose AI”, are offering game-changing functionality around image, text or speech generation but these systems remain dependent on the human generated data sets on which they have been trained.



# Machines that learn for themselves

We’re used to the concept of a computer program which is a linear set of instructions that traditional computers execute. Computers directly executing programs depend on the programmers that create this code. Machines that work in this way are fantastic at high volume, repetitive tasks but very unforgiving if you get the code wrong. This is the epitome of the “dumb machine”.

In contrast a “machine learning” system utilises an algorithmic framework – typically a neural network (a crude approximation of a set of neurons in a human brain). Rather than being directly programmed, the system is trained by repeated exposure to datasets (such as libraries of human faces or spoken words) so that it becomes expert at resolving the problem it is presented with. The difference is that the machine finds the path between question or input and answer or output for itself, via a sophisticated version of trial and error, rather than slavishly applying the rules laid out in a directly coded program.



# Opacity and the “Black Box”

Most “deep” machine learning systems are referred to as “black box”. This is because even though data scientists create the algorithmic frameworks in which they operate, they still in many cases do not know how or why in any given situation the machine reached the conclusions that it did. The pathways from input to output are not necessarily known by or visible to the programmes, and the reasons that have driven the pathways can be very difficult to identify. This is purely a function of the complexity of such systems which tends to be multiplied exponentially depending on the number of “layers” the data needs to pass through.

# Training

Training a machine learning system takes data, and a lot of it. In the industry, specific sets of training data are referred to as datasets. Typically, machine learning systems can be trained in three main ways:

– **Supervised:** The data elements in the datasets are labelled with the correct results (this method is useful in the resolution of "known" problems).

– **Unsupervised:** The data elements are unlabelled – typically where you want the machine to identify a previously hidden pattern (useful in the resolution of "unknown" problems). This might be identifying correlations which point to previously unrelated health pathologies in humans or forensically reveal a hidden trail of financial crime.

– **Reinforcement:** This is a form of unsupervised training – except that the machine is incentivised by receiving a reward for a "correct" result within the frame of reference applicable to the environment which it is operating in (usually a set of behavioural rules). Not surprisingly, this type of training works best in closed competitive environments, such as game playing (e.g. DeepMind's AlphaGo) but also conceivably in financial services investment and trading.

# Data

Securing access to relevant datasets can be a big issue in relation to the effective training of machine learning systems. And once you've managed to assemble the relevant data, it can also prove challenging to ensure that the dataset accurately reflects all of the relevant demographics of the problem that you're seeking to resolve.

This is not a new problem for statisticians but remains easier said than done to deal with – one of the biggest issues in training machine learning systems is ensuring that bias is not introduced. Machine learning systems are often said to have a “data diet dependency”. What this means is that if you've trained a machine with biased data you are extremely likely to get biased outputs. Garbage in; garbage out.

# Regulation

Regulators around the world are beginning to understand the need for these technologies to be appropriately supervised. Transparency, accountability, and trustworthiness are common focuses for policymakers. The EU has published a wide ranging draft Regulation on AI (the so called AI Act) and the UK is due to publish an AI governance white paper.

Understanding how these new rules will operate will be vital to building and deploying AI and machine learning in the future.

# Some legal issues

There is currently little specific regulation around AI, although this is soon to change with potential legislation being contemplated by the European Union, the UK and the USA in the near future.

What are some of the key concerns that AI and machine learning brings to existing law?

### 1. Causation and Liability

Causation is the term which refers to "legal cause and effect". Put simply, it is an essential mechanism which determines whether liability has been made out in any given situation. It is fundamental to our system of redress that a party suffering a wrong can claim damage against a wrong doer – usually compensatory. Causation typically requires that the harm done was foreseeable, justifying making the responsible person liable.

The simple concern here is that since machine learning systems make their own decisions which are *not* always foreseeable, it can become very difficult to establish who the party responsible for the damage actually is. Should it be the operator of the machine? The manufacturer? Or the party training the machine (if different from the producer)? These are in essence still unsettled questions. One thing is clear: different industries and sectors are developing different responses to the problem on an ad hoc basis. So, for example, in the UK the Automated and Electric Vehicles Act 2019 provides that if you're in an accident in an AV (autonomous vehicle), the law will treat the incident in exactly the same way as if you were driving an ordinary car – i.e. the insurer of the car at fault will pay out.

The EU is developing adjustments to civil litigation rules in EU member states to address some of the challenges in establishing liability for an AI system.

### 2. Data Protection

Machine learning systems, as we have seen, depend to a large degree on data as part of their training process and also when executing day-to-day tasks. When that data includes personal data, then the regimes of either the EU or UK GDPR (as applicable) and the UK's Data Protection Act 2018 need to be complied with (depending on your target market). Unfortunately there are difficulties with this legislation when it comes to so-called "black box" AI systems. This is because the legislation requires you to know the purposes for which the personal data is to be used, and to explain this to the people whose data you are using. It presumes that all IT systems are "white box" – in essence that when you commission and install them, you know what they will be used for and what outputs they will generate. But AI and machine learning systems are renowned for their predictive capabilities and may be used to identify non-obvious correlations and results.

Article 22 of the GDPR on "Automated Processing" also creates difficulties in that, in most cases, it requires automated processing within its scope (in essence any automated decision which creates legal effects, or 'similarly significantly affects' the data subject) to be explicitly authorised by direct consent – legitimate interests as a lawful processing ground is not enough.

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# Some legal issues

### 3. Intellectual Property

Making certain that you develop a strategy to handle the intellectual property ("IP") ownership/licensing issues coming out of using and/or developing an AI system is critical, as is understanding precisely where the underlying value is.

Whilst some aspects of AI systems can be protected by patents, copyright or trade secrets, machine learning systems don't fit neatly into the conventional IP categories. This is partly because the real investment and value in developing an AI solution goes into the training process. A "trained" system is viewed no differently to an "untrained" system by IP law and yet one is significantly more valuable than the other. The training datasets themselves can be of immense value, and yet it is unclear to what extent they can be protected by IP. The reality is that the most effective protection is likely to come from a combination of IP and a web of contractual provisions.

### 4. Bias and Discrimination

As mentioned previously, bias and discrimination can be key concerns when assembling and using training datasets. This is not just in the sense of making sure that the system doesn't produce biased outputs, but also determining (particularly if you've licensed-in the datasets from a third party) that there is no bias in the underlying dataset. If you don't manage this properly, there are potential legal consequences under anti-discrimination legislation such as the Equality Act in the UK and potentially the GDPR if "special category data" (e.g. data relating to an individual's health or sexual orientation) is being processed.

### 5. Competition and Anti-Trust

Competition law can also intervene in situations where the use of machine learning and access to data and data sets can distort what would otherwise be a competitive market. As ever the context needs to be judged very carefully as sometimes the opposite is true – AI can act as an enabler to open up markets which have been traditionally monopolistic.

### 6. Consumer Law

When AI systems are used by consumers, special consideration needs to be given to the impact of such use on individuals. You'll need to account for specific consumer rights legislation which may make the use of misleading practices illegal and outlaw so called "dark patterns" (designs in systems which attempt to distort consumer economic behaviours).

### 7. Reputation and Public Concerns

Organisations using certain types of AI and machine learning applications will need to be mindful of potential reputational risks. For example, there is at present a great deal of public concern about the use of automated facial recognition systems in public places, both by the police, and by private companies, with calls for a moratorium on its deployment whilst the authorities consider whether specific regulation is required. It is likely that there will be disquiet about other uses of AI in future. So where deployment of a particular type of AI system may prove controversial, the contracts for their development or operation will need to be carefully drafted to take account of this, for example regarding rights to terminate.

### 8. Artificial Intelligence as a Service (AIaaS)

Finally, many businesses are taking the decision to outsource the implementation of AI systems to third party service providers. Whilst this is not a legal issue per se, it does raise a whole host of complicating factors around the issues we have previously discussed, including the practical issues around putting in place AIaaS agreements with chosen platform providers.

# Our practice and experience

The team at Osborne Clarke is one of the leading legal practices on applied artificial intelligence and machine learning.

We don't just do the work, we are active thought leaders, adding to the wider debate and ultimately helping to shape public policy in this area.

So for example, team members are involved in the following initiatives:

### All Party Parliamentary Group (APPG) on AI

We are Advisory Board members of this committee which is a cross-parliament body made up of Members of Parliament and peers, as well as industry experts.

### International Technology Law Association (ITechLaw)

We chair ITechLaw's Responsible AI Committee, which is tasked with developing a practical global ethical framework for the use of artificial intelligence.

### European Union AI Alliance

We're part of a wider consultative body to the EU High-Level Expert Group on Artificial Intelligence.

We act for some of the world's most significant developers and users of this technology, including a global SaaS, software and AI provider and a major global social media network. We're also active in the Technology, Media and Comms, Energy and Utilities, Financial Services, Life Sciences and Healthcare, Retail and Consumer, Mobility and Infrastructure and the Built Environment sectors.

Our work includes the following:

**Big Data & GDPR**
Advising on Article 22 GDPR compliance in relation to an AI travel optimisation solution and voice data for a new 'smart speaker' AI solution

**Causation**
Advising on the legal liabilities of using automated facial recognition in the UK, Germany and France

**Bias**
Advising on indirect discrimination issues in relation to an AI content filtering tool

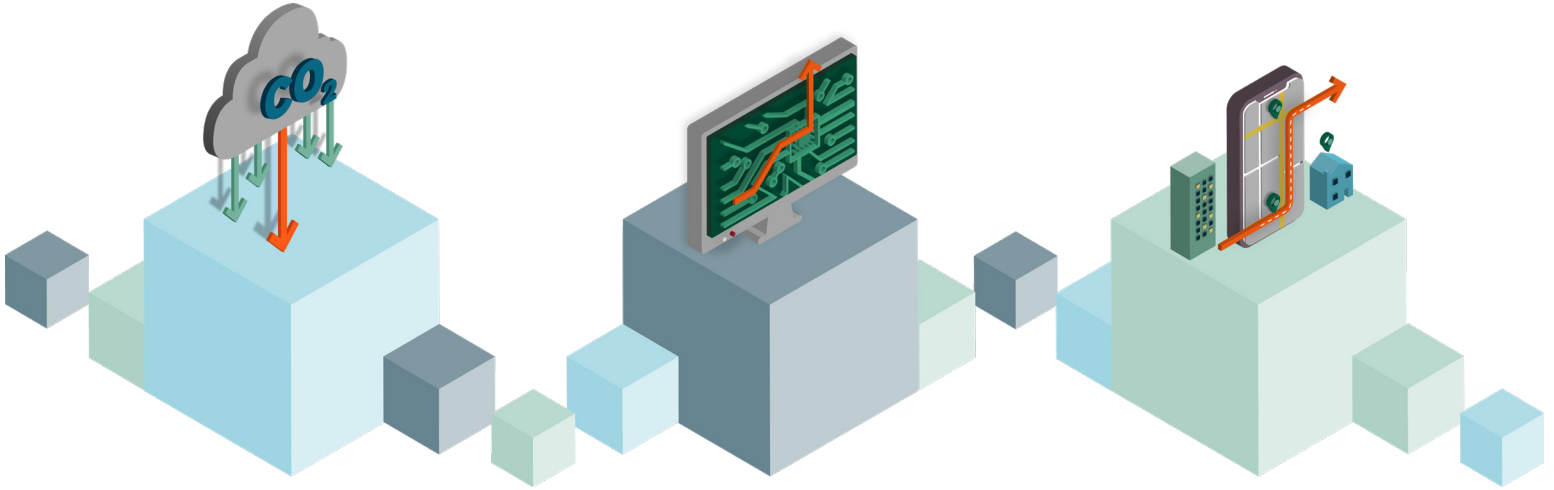
**Competition**
Advising on the extent to which a machine learning underwriting tool created market distortion in the insurance sector

**IP & Licensing**
Preparing standard form licensing for an international natural language processing solution

**Causation**
Providing guidance on the liability of in-store autonomous retail robots

# Transformation

**We immerse ourselves in the global issues that are transforming the landscape of how we live, work and do business. Focusing on the transformation drivers that will have the biggest impact on our clients, we use this insight to help you thrive, ensure agility and strengthen the resilience of your business. We are at your side, working closely with you to bring value, share new products and apply digital solutions. Together we’ll be ready for what’s next.**




## Decarbonisation

Carbon neutral imperatives are increasingly at the heart of business strategies. This will often require a radical rethink along your entire supply chain, from initial use of carbon all the way through to customer delivery. We will bring our expertise and track record to support you with every step along your decarbonisation journey.

## Digitalisation

Businesses are fast being re-shaped to fully exploit the possibilities of digital technology, but timely delivery is vital. Our lawyers are experts in advising on delivering a digitalisation strategy: from procuring digital infrastructure and technology to implementing a data strategy, or responding to a cybersecurity crisis. We support you as you expand or transform your business through technology.

## Urban Dynamics

The vast majority of businesses operate in and benefit from the urban environment. The extent to which you understand and engage with urban dynamics will have a significant impact on your continued success. We understand that the way in which cities are designed, built and managed offers extraordinary opportunities. Our legal advice is focused on helping you to realise these opportunities.

# Our experts

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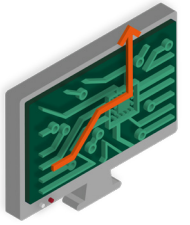

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