



Artificial Intelligence and IPR

The field of artificial intelligence or “AI” has affected virtually every industry founded on the idea that machines could be used to simulate human intelligence through so-called “machine learning” or “ML”. This evolution brings with it a number of benefits, including improvements in economic outcomes, enhanced human decision-making, increased levels of productivity and potential solutions for complex and pressing economic and social problems. IPR arising in relation to AI are of uncertain scope but are potentially wide-reaching. Their infringement carries powerful remedies ranging from temporary to permanent injunctions, to damages and accounts of profits. The following outlines some of the key IPR issues that will need to be considered in relation to AI. Accepting that there is no global consensus on whether and to what extent AI should be regulated – and still less whether the existing tools for protection and enforcement of IPR are fit-for-purpose – this article seeks to explore some key legal issues for IPR owners to consider when considering global IPR portfolios.

What is Artificial Intelligence?

A useful starting point is a definition offered by Russel and Norvig where, for example, AI is defined as computers or machines that seek to act rationally, think rationally, act like a human, or think like a human.¹

1. Russel, S. J. and Norvig, P. (2010) *Artificial Intelligence: A Modern Approach*, 3rd ed. (Pearson, 2010).

AI is therefore characterised by four features:

- **Acting rationally:** AI is designed to achieve goals via perception and taking action as a result.
- **Thinking rationally:** AI is designed to logically solve problems, make inferences and optimise outcomes.
- **Acting like a human:** This form of intelligence was later popularised as the ‘Turing Test’, which involves a test of natural language processing, knowledge representation, automated reasoning and learning.
- **Thinking like a human:** Inspired by cognitive science, Nilsson defined AI as “that activity devoted to making machines intelligent, and intelligence is that quality that enables an entity to function appropriately and with foresight in its environment”.

A further distinction may be made between narrow and general AI. Narrow AI concerns applications that provide domain-specific expertise, or task completion. General AI refers to an application that exhibits intelligence comparable to a human, or that outperforms humans, across the range of contexts in which humans interact.

The early implementations of AI mainly comprised systems within a narrow area and were programmed by human experts. The central focus of more recent developments in AI is around ML systems. In contrast to expert systems, ML algorithms and systems are trained against observational or simulated outcomes. ML applications of AI

include natural language processing and computer vision. Examples of natural language processing include machine translation, personal assistants and smart phones. Examples of computer vision include algorithms and technologies used to understand scenes (which may be captured by any one or a combination of cameras, radar lasers etc).

The debate around AI has often been linked with discussions around data and, more specifically, ‘Big data’.

The term ‘Big data’ has been coined for the aggregation, analysis and increasing value of vast exploitable datasets of unstructured and structured digital information. Big data is characterised by three main characteristics:

- **Aggregation in terms of size, shape (e.g. text, image, video, sound), structure and speed.**
- **Analysis:** Big data concerns aggregated datasets which are analysed by quantitative analysis software (using AI, ML, neural networks, robotics and algorithmic computation) on a real-time basis.
- **Increasing value:** It will facilitate small but constant, fast and incremental business change and enhance competitiveness, efficiency and innovation and the value of the data so used.



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Legal framework for AI

A starting point for a discussion about the legal framework for AI is to ask: what is the nature of AI and how does this inform the legal analysis of what rights and duties are or should be attached to it?

The debate around AI has been linked or conflated with debates around access to (personal) data. A polemic debate continues around the economic characteristics of data summed up in the often-quoted phrase that “data is the new oil”². Like oil, data or intelligence must be refined before it is useful, i.e. it has to be turned into information, knowledge or action. However, in economic terms the difference between data and oil may be viewed through the distinction between rival and non-rivalrous goods. A good is said to be rivalrous or rival if its consumption by one consumer prevents simultaneous consumption by other consumers, or if consumption by one party reduces the ability of another party to consume it. Most tangible goods, including oil, fall into this category. In contrast, a good is considered non-rivalrous or non-rival if, for any level of production, the cost of providing it to a marginal (additional) individual is zero. More generally, most intellectual property is non-rival.

In fact, this distinction is oversimplistic as a good can be placed along a continuum ranging from

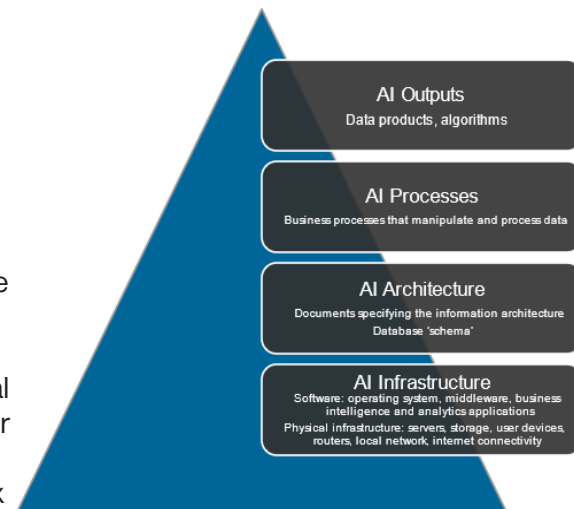
2. Clive Humby, UK mathematician and architect of Tesco’s Clubcard is widely credited as the first to use the phrase in 2006: “Data is the new oil. It’s valuable, but if unrefined it cannot really be used. It has to be changed into gas, plastic, chemicals, etc to create a valuable entity that drives profitable activity; so data must be broken down, analysed for it to have value.”

rivalrous to non-rivalrous. Unlike oil, for example, data as expression and communication is potentially limitless and it may be said that subjecting data to legal rules about ownership would be inconsistent with its nature as without limits in terms of re-use. However, digital information is only available because of investment and creative effort so has some limits.

For present purposes the equivocal position provides a starting point for legal analysis, which is that data or intelligence so derived is a complex subject in legal terms. This is best explained by focusing attention not on whether there are rights “in” data or “in” AI but there are extensive rights and obligations “in relation to” such data and its outputs, including AI. In turn this reframing of the legal analysis raises a question of whether and the extent to which it may be excludable or partly excludable (e.g. through IPR rights or data protection/privacy regulation). As a result, when discussing AI in legal terms it may be more correct to speak in terms of access to AI processes and outputs rather than ownership as such.

The relevant rights and duties arise through different mechanisms including IPR, contract, and regulation. These mechanisms operate across the following levels: AI infrastructure AI information architecture and AI outputs (see Figure 1).

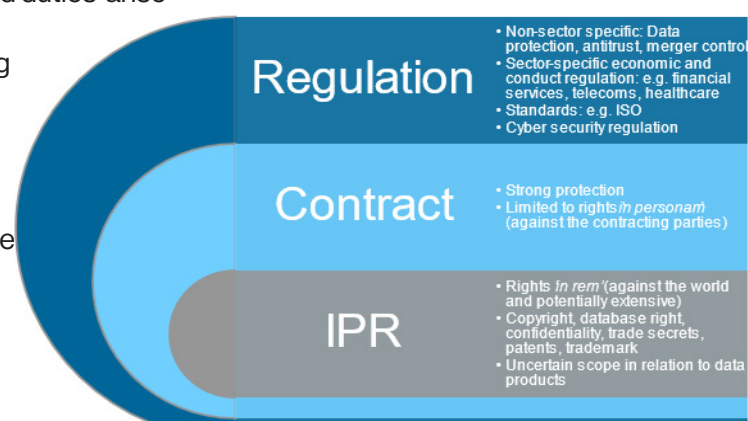
Figure 1: AI topology



Source: Author’s own analysis

The legal framework accords positive rights (in the case of IPR and contract) which can, in principle, be monetised. Negatively, breach of these rights can give rise to remedies, including damages and injunctions (in the case of IPR and contract) and other sanctions such as fines for breach of a regulatory duty (see Figure 2).

Figure 2: Legal rights in relation to AI



Source: Author’s own analysis



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Ongoing legal and regulatory developments in these areas mean that information rights law is emerging as a new and sophisticated area of law and policy in its own right, revolving around the intersection between these elements.

Copyright

There will typically be protectable copyright in the source code used for any AI and the underlying code for any algorithms, and potentially in the algorithms themselves. On its most basic level where there is human authorship this is copyright in a literary work.

The first and very important consideration in respect of AI to consider and verify is the underlying ownership of content created in designing an AI system and then by an AI system itself; these are two different things.

The difference can be seen, for example, where a human author owns copyright in source code or other data structures, but the system is then developed further by the system itself as a result of the training process. Copyright can only be attributed to a human author under UK law. Those who write the underlying source code will be a source of originality in AI-generated works exercising the skill, labour and judgement or intellectual creation in building the underlying learning algorithm. This would be dealt with in the first instance by working with the business to gain a detailed understanding of the AI system itself, those involved with the creation and their relationship with the business. It will be important

for the business to carefully define the role of those involved in the development of the system in order to confirm the authors. If all are employees of the overall owner of the system, this is less important from a rights perspective, as all rights will vest in the employer provided the work was something that was in the course of their employment (which presumably it would be). However, this is particularly relevant for defining roles from an enforcement and also licensing perspective to understand the contributions which have been made giving rise to a protectable work. It is also relevant as a consideration for the duration of the right as among other reasons, the duration of copyright in computer-generated works is shorter than for human-authored works.

Ownership of copyright works generated by AI systems is more difficult and whether this can be attributed to a human will depend on the input that has gone into the training process: the more input and thought from the human in relation to the logic of the system, the more likely the human can be attributed authorship. Human authorship will be much preferable from the business perspective as the law surrounding computer generated works is much more complicated and untested. Research should be done through considering the consequences the training input is likely to have on authorship of AI generated works, so that appropriate advice can then be given. Those who simply provide training data to the AI system are unlikely to be considered authors of any work in which the logic generated by the system resides, at least under UK law.

In addition, consideration should be given to agreements for the development and use of an AI system that may be expected to result in new copyright works as these should include appropriate express terms on ownership, assignment and licensing and should give consideration to appropriate agreements covering the express ownership of any IP generated by the AI system. A review of any such agreements already in existence will be necessary to consider how they may need to be modified and the impact on any future agreements simultaneously.

A further consideration in relation to the development of the AI is that if the AI system or source code has relied on data from a third party source to shape the characteristics of the build, in theory there may well be a license needed for this third party data. Often such system will also use open source code that is freely available, so there will be no proprietary rights in those parts. As a result, it is important to determine the extent of such use.

The key is to accurately define the rights the business has accrued in the AI and algorithms from the building of them and the potential further IPR those products then accrue themselves, and regulate the ownership and enforcement rights relating to these works through contract.

The special and somewhat distinct rules applying to database rights and computer programmes will also need to be considered.



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Database right

At EU level, separate database rights were first introduced by the EU Directive 96/9/EC on the legal protection of databases. Eligible databases receive protection in all European Economic Area member states. This included the UK when it was a member of the EU. The UK implemented the directive through the Copyright and Rights in Databases Regulations 1997. In broad terms, a database right arises in a database in whose “obtaining, verifying or presentation” the maker has made a “substantial investment”. It is infringed by “extraction and/or utilisation” of a substantial part of the database contents on a one-off

or systematically of insubstantial parts. Database rights are increasingly important for Big data and, consequently, the AI which depends on it.

Since leaving the EU the reciprocal recognition for new database rights between the EU and UK has ceased. However, the UK and EU agreed to continue the reciprocal recognition where those rights had already been awarded, i.e. UK databases created before 1 January 2021 will continue to be protected in the EU and vice-versa. Only UK citizens, residents and businesses are eligible for database rights in the UK for databases created on or after 1 January 2021.

Patents

Patents protect the way that inventions work. To obtain a patent the applicant must show that the invention is new and involves an inventive step. These tests are applied by comparing the invention to the current state-of-the-art (anything which is in the public domain when an application is filed). If there is something about the invention which is different from anything in the state-of-the-art, then it is new. However, the harder part of the test is to demonstrate an inventive step. This is about proving that the thing which distinguishes the invention from the prior art also solves a problem with that prior art





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in a way which would not be obvious to somebody who is skilled in this field.

For an AI invention, it is important to identify what the AI is contributing (beyond improved decision-making based on previously seen results).

For example, an existing computer system which is improved by the addition of AI would most likely lack an inventive step if the AI is only contributing what is expected (the improved decision making).

Therefore, if the thing that is new about the invention is the use of AI then it is important to identify what, beyond the standard improvement expected by using an AI system, the invention contributes. If it is doing something above and beyond what is expected of AI then a patent may be available. It may be that the new features are AI plus some other step and it is this combination which creates a contribution which solves a problem in a way which would not be obvious to somebody skilled in this field.

Trade mark and branding

Consideration can also be given to the end AI product and how the business wishes to market this under its brand. Consideration will need to be given as to filing strategies for trade mark applications using UK, EU and WIPO filing regimes and also using foreign agents in jurisdictions where this is required.

Contractual implications

There is also the related area of contractual implications and advice needed. Many IPR relating to AI would need to be developed

contractually and there would need to be consideration given to the contracts the business has in place regarding the AI and algorithm software, a review of those contracts and a consideration of whether any further agreements or amendments to existing contractual obligations would be beneficial and are something which can realistically be achieved.

Conclusion

IPR in relation to data and AI infrastructure, processes and output are of uncertain scope at present and the law in this area is likely to develop as AI gathers momentum. From an IPR perspective the main areas are copyright (with related database and software rights within that sphere) and patents. There is also a related question of trade mark rights and branding which may be applied to any end AI product marketed or licensed. This is an area that would merit further research, not least because IPR give rise to extensive rights (in rem) which are enforceable outside a contractual relationship.

Professor Suzanne Rab is a barrister at Serle Court Chambers in London specialising in competition law, IPR and regulation. She has particular expertise in cases at the intersection between IPR and competition law. Suzanne is grateful to Kelly Hudson of McDaniel & Co for her insights and contribution to the preparation of this article.

Suzanne is author of chapters on Competition Law and Telecommunications in the book Artificial Intelligence Law and Regulation (Edward Elgar, March 2022). The book provides an extensive overview and analysis of the law and regulation as it applies to the technology and uses of AI. It examines the human and ethical concerns associated with the technology, the history of AI and AI in commercial contexts. Further information can be found at: <https://www.e-elgar.com/shop/gbp/artificial-intelligence-9781800371712.html>



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