Open consultation

Artificial Intelligence and Intellectual Property: copyright and patents

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Artificial intelligence (AI) is a transformative technology, which is already revolutionising many areas of our lives. Unleashing the power of AI is a top priority in the plan to be the most pro-tech government ever.

We are building on the achievements under the AI Sector Deal. A new plan to make the UK a global centre for the development, commercialisation and adoption of responsible AI was published earlier this year. The new National AI Strategy (https://www.gov.uk/government/publications/national-ai-strategy) will secure the UK's position amongst the global AI superpowers. The strategy will ensure we invest in the long-term needs of the UK's AI ecosystem and that every sector and region can benefit from the transition to an AI economy by focusing on encouraging innovation whilst protecting the public.

The UK Innovation Strategy: leading the future by creating it (https://www.gov.uk/government/publications/uk-innovation-strategy-leading-the-future-by-creating-it/uk-innovation-strategy-leading-the-future-by-creating-it-accessible-webpage) sets out our long-term plan for delivering innovation-led growth. Its primary aim is to boost private sector investment across the whole of the UK. This will ensure the right conditions for all businesses to innovate and giving them the confidence to do so.

AI can support innovation and creativity in a range of ways. It can be a tool for scientists, entrepreneurs, and artists, enabling new human inventions and creations. Some believe that AI will soon be inventing and creating things in ways that make it impossible to identify the human intellectual input in the final invention or work. Some feel this is happening now.

Intellectual property (IP) gives researchers, inventors, creators, and businesses the confidence to invest their time, energy and money in doing something new. It underpins economic growth by incentivising investment, safe-guarding assets and enabling the sharing of know-how in technologies like AI.

The government has previously sought views on the interaction of AI and IP (https://www.gov.uk/government/consultations/artificial-intelligence-and-intellectual-property-call-for-views/government-response-to-call-for-views-on-artificial-intelligence-and-intellectual-property). Questions were raised about the balance in the copyright system between the protection of human works and AI works. Some felt that copyright might present barriers in the development of AI itself, for example, using works subject to copyright in further innovation and research. For patents, issues were identified that may act as a barrier to innovation as the use of AI systems increases.

In response, we identified actions to consult on how far copyright and patents should protect inventions and creative works which are made by AI. We also committed to consult on measures to make it easier for AI to use copyright-protected material. The ambition is to encourage innovation in AI technology and promote its use for the public good. At the same time, we aim to preserve the central role of intellectual property in promoting human creativity and innovation.

This consultation seeks evidence and views on a range of options on how AI should be dealt with in the patent and copyright systems. This outcome will support the AI strategy focus on growth of the economy through widespread use of AI technologies.

We are consulting on three specific areas:

1. Copyright protection for computer-generated works without a human author. These are currently protected in the UK for 50 years. But should they be protected at all and if so, how should they be protected?

2. Licensing or exceptions to copyright for text and data mining, which is often significant in AI use and development.

3. Patent protection for AI-devised inventions. Should we protect them, and if so, how should they be protected?

How to respond to this consultation

A response form (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1028456/Consultation-response-form.docx) is available below. Please send responses to AIcallforviews@ipo.gov.uk. In replying to this consultation you may find it helpful to refer to the IPO's Guide to evidence for policy (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/510985/Guide_to_evidence_for_policy.pdf).

Closing date

This consultation will run for 10 weeks. It commences on 29 October 2021 and will close at 23:45pm on 7 January 2022.

Next steps

After this consultation closes the government will assess responses. The information obtained will inform a government decision on any changes to legislation. Final stage impact assessments and policy decision announcements are generally published on GOV.UK.

Introduction

Unleashing innovation and creativity will be at the heart of the post-pandemic recovery and support British businesses to build back better. Innovation and creativity are also central to the government's levelling up agenda.

Intellectual property (IP) gives researchers, inventors, creators, and businesses the confidence to invest their time, energy and money in doing something new. It underpins economic growth by incentivising investment, safeguarding assets and enabling the sharing of know-how in technologies like artificial intelligence (AI). The benefits of IP are not only for businesses' bottom lines. There is investment in talented workers, regional clusters, the people, and communities who benefit from new ideas, products and entertainment. It also helps the nation's standing on the world stage.

Britain has always been a world-leader for Intellectual Property (IP). We are now consulting on how the IP system can best incentivise research, development, and deployment of AI technology. We want the UK to be the best place in the world for AI start-ups, scaleups and technology leaders to do innovative research and development. And stimulating further innovation and creativity in the UK and worldwide by commercialising the fruits of that research.

AI has huge potential to rewrite the rules of whole industries. It can drive substantial economic growth and transform all areas of life. The UK is a global superpower in AI, well placed to lead over the next decade - a genuine research and innovation powerhouse. Our work on AI and IP supports the ambitions set out in the National AI Strategy (https://www.gov.uk/government/publications/national-ai-strategy). The strategy will ensure the UK continues to be a world leading location for research, development, commercialisation, and deployment of AI.

AI's role in innovation and creativity

This consultation looks at the IP rights of patents and copyright, which reward and protect inventions and creative works. AI is playing an increasing role in both technical innovation and artistic creativity. Patents and copyright must provide the right incentives to AI development and innovation, while continuing to promote human creativity and innovation.

AI can support innovation and creativity in a range of ways. It can be a tool for scientists, entrepreneurs and artists, enabling new human inventions and creations. Some believe that AI will soon be inventing and creating things in ways that make it impossible to identify the human intellectual input in the final invention or work. Some feel this is happening now.

If or when inventive and creative AI exist, the IP system must be appropriate to deliver the benefits to society - the human benefits of this innovation. Meanwhile, we must ensure that patents and copyright also work where AI is supportive of invention and creativity but not its sole author or inventor.

In response to the Call for Views on AI and IP (https://www.gov.uk/government/consultations/artificial-intelligence-and-intellectual-property-call-for-views/government-response-to-call-for-views-on-artificial-intelligence-and-intellectual-property), questions were raised about the balance in the copyright system between the protection of human works and AI works. Some felt that copyright might present barriers in the development of AI itself. For example, using works subject to copyright when training AI and in innovation and research. For patents, issues were identified that may act as a barrier to innovation as the use of AI systems increases.

We are now seeking to understand the issues in more detail and are consulting on three specific areas:

1. Copyright protection for computer-generated works without a human author. These are currently protected in the UK for 50 years. But should they be protected at all and if so, how should they be protected?

2. Licensing or exceptions to copyright for text and data mining, which is often significant in AI use and development.

3. Patent protection for AI-devised inventions. Should we protect them, and if so, how should they be protected?

Any measures we put in place should:

1. Encourage innovation in AI technology and promote its use for the public good;

2. Preserve the central role of intellectual property in promoting human creativity and innovation;

3. Be based on the best available economic evidence.

Copyright

Existing copyright protection

In the UK copyright law protects original literary, dramatic, artistic and musical works, as well as films, sound recordings, broadcasts and published editions. For a work to be original it must be the author's own intellectual creation. This means the author has made free and creative choices and the work has their "personal touch". Copyright in a literary, dramatic, artistic or musical work lasts for the author's lifetime plus a further 70 years. For other works the term of protection differs.

A copyright work may be created by a human who has assistance from AI. If the work expresses original human creativity it will benefit from copyright protection like a work created using any other tool. An example of this could be where a camera contains AI that helps someone take a photograph. If the photograph expresses the creativity of the photographer, it will be protected as an artistic work, regardless of whether AI assisted them.

Computer-generated works

The UK is one of only a handful of countries to protect works generated by a computer where there is no human creator. The “author” of a “computer-generated work” (CGW) is defined as “the person by whom the arrangements necessary for the creation of the work are undertaken”. Protection lasts for 50 years from the date the work is made.

Other protection for computer-generated works

As well as original literary, dramatic, musical and artistic works, copyright protects broadcasts, films, sound recordings, and published editions. These so called “entrepreneurial works” do not need to be original. But this lower bar for protection is accompanied by a narrower, and usually shorter, right. For example, sound recording protection only extends to a specific recording of a song and lasts for 70 years from creation. Where AI generates a work that falls into one of these categories, entrepreneurial rights would apply. So, for example, if AI generates a song, then the producer of the recording of the song would have a sound recording right.

The UK also protects investments in databases. Database rights protect the contents of a database and lasts for 15 years. A database does not have to be original for it to qualify for database rights. However, there needs to have been a substantial investment in obtaining, verifying or presenting the data. If AI generates a database that fulfils these criteria, then there may be a database right associated with it.

Criticism of computer-generated works protection

Criticisms have been made of the specific provision for computer-generated works.

From a legal perspective, a computer-generated work must be original if it is to receive protection. But the legal concept of originality is defined with reference to human authors and characteristics like personality, judgement and skill. It has been argued that the law is unclear and contradictory.

From an economic perspective, some argue that copyright protection for computer-generated works is excessive. This is because computers do not need to be rewarded to produce new content, but IP rights have costs to third parties. They reason that this protection should be removed or limited to the minimum necessary. Others believe that computer-generated work protection may incentivise investment in AI technology, though they disagree on the ideal scope of this protection.

From a philosophical perspective some argue that copyright, with its roots in human authorship and creative endeavour, should only apply to human creations. They maintain that protecting computer-generated works may promote these works at the expense of human creations and devalue human creativity.

Interaction with designs

In its response to the Call for Views, the government noted that designs legislation appears to be able to respond to the challenges of AI. But there is a need to monitor the situation as the AI systems used in the design process develop.

UK law on registered and unregistered designs includes similar provisions on computer-generated designs to those in copyright law. The author of a computer-generated design is “the person by whom the arrangements necessary for the creation of the design are made”.

We are not proposing any amendments to design law at this stage. But we welcome views on the implications of the policy options for computer generated works on the design system.

False attribution

In responses to our Call for Views, some expressed concern about possible confusion as to whether works are created by a human or computer. In some cases, a person may falsely claim that a work generated by AI is actually generated by them. This would mean they would benefit from longer copyright protection. Some respondents suggested that works generated by AI should be automatically tagged in some way to show their origin. Others suggested introducing a specific sanction for falsely claiming AI generated work was created by a human.

We do not think that false attribution is a substantial issue at present. There are already provisions in law that may be relied upon if works are being falsely attributed to humans. For example, the Fraud Act 2006 includes provisions to penalise people who make false representations for gain. We think this is sufficient to address any existing or near-future issues relating to false attribution and AI. But we would welcome further views on this issue.

Policy options

The government has explored three options relating to the computer-generated works provision. Any changes that are made to this provision would apply to all computer-generated works without a human creator, regardless of whether AI is involved.

Option 0: Make no legal change

One option is to do nothing and maintain the status quo. Copyright would apply to computer-generated works as set out above.

We do not know the extent to which AI users, developers and businesses rely on copyright in computer-generated works now. Equally, we don’t know what types of work are currently generated by computers without human creativity. Nor do we know how this might change as more AI is developed and used more widely.

We are keen to understand the value of copyright in computer-generated works and the effect on AI investment decisions. We are also keen to understand stakeholder experiences in territories where there is no copyright protection for works without a human creator.

This option would be justified if the current approach to computer-generated works were shown to have an incentive effect in encouraging new AI-generated works and investment in AI technology. It would also be necessary for this to come without unreasonable costs to third parties, including users of these works and human creators.

Option 1: Remove protection for computer-generated works

Under this option we would remove the computer-generated works provision, with the intention to limit copyright protection to human creators. Works generated by a computer would not be protected by copyright.

However, AI-assisted works with a sufficient level of human intellectual creativity would continue to be protected, as described above.

Sound recordings, films, broadcasts or published editions made by AI would also continue to be protected (as these do not have an originality requirement).

This option would be justified if granting copyright for computer-generated works is not necessary to incentivise their production or has an unreasonable cost to third parties.

Option 2: Replace the current protection with a new right of reduced scope/duration

Under this option we would remove the existing copyright protection for computer-generated works as described under Option 1. We would provide a new type of protection instead.

The duration of protection of works would be chosen to reflect the effort or investment put into their creation. In light of arguments that the present term of protection is too long, a shorter term of protection, for example 5 years, could be considered. The duration would aim to reflect the capacity of computers to generate works quickly, with little effort or human input. The term should be no longer than is needed to encourage the production of AI-generated works. A shorter term of protection would allow third parties to benefit from free use of the work once the protection had expired earlier than the current 50-year term.

The new form of protection would sit alongside any other rights that subsist in the work. This means it could subsist in a work which is a combination of human and AI creativity. At present, the special protection given to computer-generated works only applies where there is no human author. This means there is no joint authorship in a co-creation by a human and an AI system.

Under this option, the “author” of the computer-generated work would be the same as now – the “person by whom the arrangements necessary for the creation of the work are undertaken”. This is similar to how the producers of sound recordings and films are identified, and we believe it to be reasonably clear.

We would also maintain existing entrepreneurial rights for these works. So, where AI generates a sound recording, rights in the sound recording would exist alongside the rights in the computer-generated work.

As for Option 1 there would be no change where AI has been used as a tool to assist a human creator, as this would fall under general copyright protection.

This option would be justified if there is evidence that protection for computer-generated works incentivises their production or investment in AI technology. The evidence would need to point to more limited protection than at present setting a better balance between right holders and third parties.

Questions

1. Please rank these options in order of preference (most to least preferred) and explain why

2. Do you currently rely on the computer-generated works provision? If so, please provide details of the types of works, the value of any rights you license and how the provision benefits your business. What approach do you take in territories that do not offer copyright protection for computer-generated works?

3. If we introduce a related right for computer-generated works, as per option 2, what scope and term of protection do you think it should have? Please explain how you think this scope and term is justified in terms of encouraging investment in AI-generated works and technology.

4. What are your views of the implications of the policy options and of AI technology for the designs system?

5. For each option, what are your views on the risk that AI generated works may be falsely attributed to a person?

Text and data mining (TDM)

Text and data mining (TDM) is the use of automated computational techniques to analyse large amounts of information to identify patterns, trends and other useful information. TDM may be used to develop and train AI and has a range of other uses including enabling research. This includes the analysis of medical and scientific data, business intelligence, and data analytics. TDM automates and accelerates what would traditionally be done by eye - reading a document, making notes, and understanding relationships and trends.

TDM usually requires copying of the material to be analysed. Some of this material will be protected by copyright. To data mine, including for training AI, it is often necessary to acquire a copyright licence or rely on a copyright exception.

Existing copyright framework

The UK has a specific copyright exception for TDM, which was introduced in 2014. This exception has the following features:

1. It permits the making of copies of any copyright work for the purpose of TDM for non-commercial research;

2. Researchers must have lawful access to material (for example, via subscription or permission by way of terms and conditions);

3. Publishers and content providers may apply reasonable measures to maintain their network security or stability;

4. Contract terms that stop researchers making copies of works for TDM to which they have lawful access are unenforceable;

5. Acknowledgement of the works and rights holders is required unless impractical.

Guidance for researchers (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/375954/Research.pdf) was published when the exception was introduced.

TDM is also possible in other ways:

- copyright expired: If the term of protection has ended, TDM can be used on those works without permission
- temporary copying exception: This allows temporary copies to be made of most copyright works for lawful use of the work. This is only permitted as long as the copy has no independent economic significance

- licensing: As the exception covers non-commercial research TDM, licences are likely to be required when TDM is for a commercial purpose. Some right holders charge a fee to make content available under a licence. A licence might be in the form of a subscription with associated terms and conditions, or individually negotiated agreements. Alternatively, some material may be available to mine when the right holder has set up free licensing conditions in advance. Most commonly, this would be subject to a generic licence condition, such as Creative Commons or the Open Government Licence. Each licence will have conditions attached, such as attribution
- copyright does not exist: It should be remembered that not all sources of text or data will be protected by copyright or the database right. In such cases these will not restrict TDM, however, other areas of law may be relevant, including data protection, general licensing, or other contractual restrictions

The copyright exception for TDM does not apply to the database right, so currently all TDM on databases which qualify for that right would require a licence.

Policy options

Four main options are considered, with increasing intervention for each option. These are informed by the approach taken on TDM in other countries.

Option 0: Make no legal change

The current TDM exception would remain unchanged, as outlined above. Updated guidance on the definition of non-commercial research and what might constitute fair dealing could be produced. This would give both researchers and rights holders greater clarity about what can and cannot be done under the exception. The Post-Implementation Review (PIR) (https://www.legislation.gov.uk/uksi/2014/1372/pdfs/uksiod_20141372_en_002.pdf) on copyright exceptions published in 2020 concluded that the TDM exception was valuable and being used for non-commercial research, as intended.

Some drawbacks of the exception were raised in the PIR, specifically the application only to non-commercial research and the fact that databases are out of scope. These could not be addressed directly through the PIR process which only looks at the impact of the exception as introduced.

This option would be justified if the current law is not an impediment to accessing material for text and data mining, in particular when training AI systems.

Option 1: Improve licensing environment for the purposes of TDM

This option would seek to ensure best practice in licensing of rights for TDM. Ways to implement this could be, for example, through educational materials, model licences (such as the Community Data Licence Agreement (https://cdla.dev/)), or codes of practice. These could be used to assist negotiations between users and rights holders.

This option could be justified as licences can provide more legal certainty than relying on an exception. They enable copyright owners to benefit through licensing income from data mining by others, using their works. But they also have a corresponding licensing cost to those doing the mining. There are also transaction costs associated with locating rights holders, drawing up licensing

agreements, etc. These costs will vary depending on who the rights holder is and whether they are used to licensing for this purpose. The opportunity to license may also encourage some rights holders to provide value-added data-mining products to their services.

As there is limited data on the use of licensing for TDM, we encourage respondents to submit more information on this area to help identify the best option.

Option 2: Extend the existing TDM exception to cover commercial research and databases

This option would extend the existing exception to also allow commercial scientific research outcomes and allow TDM of databases. This would support the variety of research projects which use TDM and would allow all types of funding models to promote new discoveries.

Contract terms attempting to override the exception would be made unenforceable, and application of technological protection measures (https://www.gov.uk/government/publications/technological-protection-measures-tpms-complaints-process/guidance-on-the-technological-protection-measures-tpms-complaints-process) would be restricted, as with the existing exception.

Protections for rights holders would still be in place, including requiring lawful access to material (for example through subscription) and allowing reasonable measures for network security and stability.

Option 3: Adopt a TDM exception for any use, with a rights holder opt-out

This new exception would permit TDM for any use by anyone, commercial or non-commercial. It is modelled on the exception recently introduced by the EU, which was advocated by some respondents to the Call for Views.

It would not be restricted to scientific research and so would allow TDM to enable training AI systems for any purpose. It would support commercial uses of research and machine learning, as well as other TDM uses like business analytics, journalism and citizen engagement.

The exception would cover both copyright works and those protected by the database right. Users would still require lawful access to the works, which means that subscriptions and licences would still be viable for rights holders. However, once access was granted, and paid for if necessary, data mining would be permitted. Users would be able to retain the copies for as long as necessary (to verify results, for example).

However, rights holders would be able to opt-out individual works, sets of works or all their works that they did not want to be mined. An opt-out could operate through a machine-readable opt-out, so that computers mining significant numbers of works can identify works that can be lawfully mined.

Advantages of this option are that it would remove the high costs associated with mining works where licences are difficult to agree. For example, works available on the open internet, where it may be difficult to track down and negotiate with thousands of separate copyright owners. This option would still enable rights holders to license works when they wish to.

Option 4: Adopt a TDM exception for any use, which does not allow rights holders to opt out

This new exception would permit TDM for any use by anyone and would allow TDM for both non-commercial and commercial purposes, such as research, machine learning, business analytics or journalism. It would cover both copyright works and those protected by the database right.

This option would be like Japan's exception for information analysis or Singapore's proposed exception. These were recommended by some respondents to the Call for Views.

Lawful access would still underpin the exception and licences and subscriptions to allow such access would be permitted. However, there would be no opt out or ability to override the exception by contract.

This option is likely to be most favourable to researchers, those training AI systems, and others making use of TDM. But it would be the least favourable to rights holders, who would have their ability to license TDM restricted.

Questions

6. If you license works for TDM, or purchase such licences, can you provide information on the costs and benefits of these? For example, availability, pricing, whether additional services are included or available, number and types of works covered by the licence. Please also consider the benefits that TDM provide to you and your colleagues.

7. Is there a specific approach the government should adopt in relation to licensing?

8. Please rank the options in order of preference (most to least preferred) and explain why.

9. If you have experience of the EU exception with opt out for rights holders, how has this affected you?

10. How would any of the exception options positively or negatively affect you? Please quantify this if possible.

Patents

Developments in technology mean that AI is making significant contributions to innovation. Indeed, the UK Intellectual Property Office has already received two patent applications which name an AI system as inventor. UK patent law allows humans that use AI to devise inventions to be named as inventor in most cases. This allows protection and incentivisation for such innovations. However, the current rule for inventorship in the UK could potentially be improved to better support innovation as the capability of AI increases.

The government is keen to ensure that innovation is properly encouraged through the IP system. It also wants investment in research and development (R&D) to be appropriately rewarded, regardless of the sophistication of the tools used in the invention process, or the genesis of invention. If AI-devised inventions are unable to be patented, there may be less investment in this technology. Alternatively, this may encourage use of trade secrets, which could harm follow-on innovation.

Patents could be justified if they were to incentivise the generation of new AI-devised inventions. This could indirectly encourage the creation of new AI systems, without unreasonably restricting competition and innovation by third parties.

Some say that a proliferation of patents covering AI-devised inventions could have a detrimental effect on innovation and competition. For example, advances in AI could reduce innovation costs, resulting in large volumes of patents. These patents may be held by a small number of dominant players with access to the best AI technology and training data. This may be a problem for small and medium enterprises (SMEs) and start-ups struggling to grow in this environment.

There are also fears that the current patent system may lead to uncertain claims of human inventorship.

Inventorship

UK patent applicants must name a human inventor or inventors (https://www.legislation.gov.uk/ukpga/1977/37/section/13). This was confirmed by the Court of Appeal when a patent applicant named AI as inventor in two patent applications.

The correct identification of the inventor is important because the right to own a patent, and therefore its benefits, flows from the named inventor. Even if AI could be identified as inventor, then it will still be necessary for the patent applicant to show how they would be entitled to the patent. In the recent case, the Court of Appeal said that the applicant was not able to show any law that would give him the ownership of any patent.

Only the "actual deviser of the invention (https://www.legislation.gov.uk/ukpga/1977/37/section/7)" can be named as inventor in the UK. "The actual deviser" is determined on the facts using a well-established approach by the courts.

A small number of countries have recently taken the step of granting patents where an AI system is named as an inventor. However, the overwhelming majority, including the UK, restrict patent inventorship to natural persons. In 2018, the five territories that receive 80% of the world's patent applications required the patent inventor to be human.

Policy options

Option 0: Make no legal change

Under this option, the current system in which patents are only available where the inventor is human, would be maintained. Patents would remain available where AI tools are used by a human inventor. Patents would not be available where AI is named as the deviser of the invention even if jointly with a human co-inventor.

Current UK inventorship law is sufficient in the view of some stakeholders. They say a human will continue to qualify as inventor for most inventions made with AI involvement, at least in the short term.

This option provides advantages for businesses who operate internationally as it keeps patent inventorship requirements more consistent across important commercial markets. A change to allow AI inventorship in the UK could prejudice foreign patent filing in these markets where AI inventorship is excluded. Those stakeholders who expressed this concern suggested that any change be achieved internationally rather than unilaterally.

On the other hand, it is not clear that this option is optimal to incentivise research, development, and deployment of AI.

Option 1: "Inventor" expanded to include humans responsible for an AI system which devises inventions

Under this option, a patent application would still have to name human inventors for it to be granted. The law would make clear that the inventor would be the human who made the arrangements necessary for the AI to devise the invention. This would be under the condition that no human qualifies as inventor. The meaning of the term 'inventor' would remain as currently understood. There is no intention to change the well-established test that determines the actual deviser of the invention. Entitlement to the patent would then flow as present.

A patent would not be granted to an application naming an AI system as the inventor. If a human qualifies as inventor, then they should be named in the application as now.

Inventions devised by AI would be patentable in the UK. This option would remove concerns about the validity of a patent if it were difficult to directly credit an inventive contribution to a human. This may encourage investment in R&D that employs AI, as patents would be available whether AI or a human devised the invention.

If AI does devise an invention, an applicant may or may not disclose this in the description of their invention. However, naming a human inventor would be in line with most international inventorship practice. Filing a UK patent in this case would not prejudice foreign filings.

This option would also address the question of entitlement to AI-devised inventions. We don't anticipate that the current rules on entitlement should need amendment, but we would be interested to hear your views on this. The legal link between inventorship and entitlement in UK law means that a change to the former would impact which person qualifies for the latter.

With this approach, people involved in the following activities could potentially be considered human inventors:

- programming the AI, configuring the AI, operating the AI, selecting input data such as training data for the AI or recognising applications of the output of the AI

In general terms, the inventor could be "the person by whom the arrangements necessary for the devising of the invention are undertaken". Mere involvement with the development of an invention would not necessarily qualify a person as inventor. There would be no change to the current approach used by the courts to identify the "actual deviser".

Option 2: Allow patent applications to identify AI as inventor

Under this option, the patent system would be adjusted so that UK patents protect inventions devised by AI. Unlike option 1, it would always be transparent that a non-human inventor has devised an invention with no requirement to name a human inventor.

We suggest two different ways of achieving this:

a) amend legislation to allow AI to be named as the inventor; or

b) amend legislation to remove the requirement to name an inventor if the invention is devised by AI.

Under both approaches, patent law would provide a right to obtain and own patent rights for an invention devised by AI. The human closely responsible for an invention devised by AI would own the patent rights in the first instance. We suggest the criterion to identify the patent owner in option 2 could be the same criterion proposed to identify the inventor under option 1. So, if no human qualifies as inventor, then the patent owner is the human who made the arrangements necessary for AI to devise the invention.

Neither approach would confer AI systems with the right or ability to apply for or own patent rights and there is no proposal to do this.

The extent of potential patents available in the UK under options 1 and 2 would be similar. As would be the incentive effect for investment in R&D using AI. The option 2 approach, unlike option 1, would not prevent the grant of UK patents to applicants who declare AI, not a human, as inventor.

There may be limits to the extent that the option 2 approach might benefit those using AI to innovate. For example, having declared an AI system as inventor on their UK patent, businesses may find they are unable to gain patent protection in other markets which only recognise human inventors. This could discourage applicants from identifying AI as inventor on a UK patent if this puts patent family equivalents at risk of legal challenge. UK patent protected inventions may also face copying and appropriation in other markets.

The option 2 approach could make public the role of AI in devising inventions. This could promote the greater use of AI technology in research and development.

Several stakeholders are concerned that identifying AI as inventor would change how other patent law requirements are applied. They say this could lead to different attributes being credited to the person skilled in the art.

Most stakeholders said that AI should not own patents. Instead, they suggest that AI users, owners or developers could own any patent rights in the first instance. The same humans proposed as inventors under option 1 are suggested as patent owners under option 2. These would be persons responsible for making the arrangements necessary for AI to devise the invention. It may be that legal persons could also qualify as patent owners - either directly or through natural persons. This will be the case where contractual obligations pass patent ownership to a corporate entity.

Like option 1, option 2 would not change the well-established test that determines the actual deviser of the invention.

Under option 2, other aspects of UK law may need to be amended to allow legal challenge. For example, to allow challenge if AI has been wrongly named or not named at all as the inventor.

Option 3: Protect AI-devised inventions through a new type of protection

Under this option, a new type of protection would be created, similar to a patent but with more limited exclusive rights. This would protect inventions which currently fail to qualify for patent protection as they are AI-devised, and a human inventor cannot be identified. This would operate alongside the current patent system. The relationship between the two systems would need to be made clear especially where inventions have both human and AI co-inventors.

In the view of some stakeholders, a new right could strike an appropriate balance between protecting AI-devised inventions and rewarding those who invest in them. Some suggest a benefit of a new right would be that it would not unreasonably restrict wider competition and innovation by third parties.

There are a variety of ways that this new type of protection could operate.

A new type of right could have similar conditions for grant as those currently required for human devised inventions. However, it could have a stricter test of inventive step. A stricter test could be appropriate because AI may invent in ways that human inventors would not deem obvious.

Alternatively, the right could be granted without a test of obviousness, with novel AI-devised inventions being automatically protected. This would provide certainty that AI-devised inventions would be protected quickly in recognition of faster innovation turnover. Decisions on validity could be left to the courts.

In either case, it could also have a shorter term of protection than the 20 years conferred by patents. This is because there may be potential for AI to create inventions more quickly or efficiently than human inventors. Also, because AI itself does not require monetary or reputational reward.

Therefore, the duration of protection may not need to be as long to enable firms to profit from their investment. A shorter term of protection would also mean other innovative firms would be able to benefit earlier from free use of the protected invention.

If a new right provided less protection than a patent it would potentially encourage applicants not to acknowledge AI inventorship to gain patent protection. Alternatively, applicants might acknowledge AI inventorship when AI was not actually involved. This could be the case if a new type of right is quicker to obtain or has a lower criterion to gain protection.

A new type of protection was suggested in a number of responses to the call for views. We are unaware of any country that offers a separate right for AI inventorship. This consultation seeks further evidence to demonstrate why it would incentivise innovation and investment in AI. We also welcome views on the exclusive rights that would be conferred, the conditions for its grant and the link with the patent system.

Questions

11. Please rank these options in order of preference (most to least preferred) and explain why?

12. Would the changes proposed under Options 1, 2 and 3 have any consequential effects on the patent system, for example on other patentability criteria?

For options 1 and 2:

13. If UK patents were to protect AI-devised inventions, how should the inventor be identified, and who should be the patent owner? What effects does this have on incentivising and rewarding AI-devised inventions?

14. In considering the differences between options 1 and 2, how important is it that the use of AI to devise inventions is transparent in the patent system?

15. Would the UK adopting option 2 affect your global patent filing strategy, if so, how?

For option 3:

16. What term and scope of protection should a new right offer?

17. What should the criteria for grant of a new right be and why? Particularly should it:

a) Replicate the current requirements for a patent?

b) Set a different bar for inventive step?

c) Be an automatic or registered right?

Responses and next steps

A response form (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1028456/Consultation-response-form.docx) is available. Please send responses to AIcallforviews@ipo.gov.uk. In

replying to this consultation you may find it helpful to refer to the IPO's Guide to evidence for policy (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/510985/Guide_to_evidence_for_policy.pdf).

After this consultation closes the government will assess responses to this consultation. The government will note all responses and publish a response document in due course but will not respond to comments on an individual basis. Final stage impact assessments and policy decision announcements are generally published on GOV.UK.

Data protection and confidentiality

A summary of responses to this consultation will be published on GOV.UK (https://www.gov.uk/search/policy-papers-and-consultations?content_store_document_type%5B%5D=open_consultations&content_store_document_type%5B%5D=closed_consultations&organisations%5B%5D=intellectual-property-office&order=updated-newest). The government considers it important in the interests of transparency that the public can see who has responded to government consultations and what their views are.

By responding to this consultation, you acknowledge that your response, along with your name and/or organisation may be made public when a response to the consultation is published in accordance with the access to information regimes. These are primarily the Freedom of Information Act 2000 (FOIA) (https://www.legislation.gov.uk/ukpga/2000/36/contents), the Data Protection Act 2018 (DPA) (https://www.legislation.gov.uk/ukpga/2018/12/contents), the UK General Data Protection Regulation (UK GDPR) and the Environmental Information Regulations 2004 (EIR) (https://www.legislation.gov.uk/uksi/2004/3391/contents/made).

Additionally, information provided in response to this consultation, including personal information or commercially sensitive information, may be made available to the public on request in accordance with the requirements of FOIA and EIR.

If you wish to highlight that information is confidential or sensitive, please advise us in writing when you provide your response. If there is a request to make any confidential information publicly available, we will consider the request according to the appropriate legislation. We will treat each request individually and in line with any request to maintain confidentiality.

The government may also publish consultation responses in response to any FOIA/EIR requests on GOV.UK (https://www.gov.uk/search/transparency-and-freedom-of-information-releases?organisations%5B%5D=intellectual-property-office&parent=intellectual-property-office).

Please read the privacy statement (https://www.gov.uk/government/organisations/intellectual-property-office/about/personal-information-charter#privacy-notices) and privacy notice for consultations (https://www.gov.uk/government/publications/intellectual-property-office-privacy-notices/privacy-notice-for-personal-data-processed-for-consultations-and-stakeholder-engagement) for more information.

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