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Culture, Media and Sport Committee

Connected tech: AI and creative technology

Eleventh Report of Session 2022–23

Report, together with formal minutes relating to the report

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The creative and entertainment potentials of emerging technologies are expansive, providing new ways to distribute content, enhance existing physical experiences and explore immersive virtual worlds. More people are using smart speakers and connected TVs in their homes, more games and leisure activities are incorporating augmented and virtual reality (AR/VR) technologies and more artists are relying on digital tools to help bring new creative productions to their audiences. Meanwhile, artificial intelligence (AI) has become more sophisticated and better able to generate digital art.

However, as we highlighted in our first report on connected tech, while emerging technology can offer many benefits to the creative industries and their consumers, there are also a range of risks and harms associated with their use.

Our report explores the impact of the development of AI. First, we scrutinise the UK's proposals for regulation of AI in the round, before focusing on the implications of the proposed copyright exemptions for text and data mining (TDM), which risks reducing arts and cultural production as mere "inputs" in AI development. We call on the Government to abandon its plans for a TDM exemption and work to rebuild the trust of the creative industries.

We also evaluate the applications of creative connected technology, from AR/VR to digital and AI-generated art. We explore three case studies, which have shaped our conclusions and recommendations about creative technology and showcase the many different ways that the creative industries are using technology to develop new, immersive cultural experiences. We also consider how the skills shortages in the creative and tech sectors are limiting the growth and potential of creative technology in the UK despite headline successes, and how AI outputs are disrupting traditional cultural production. We recommend that the Government address the issue of skills in its upcoming Cultural Education Plan and ensure that creatives' rights are protected from AI-generated media in the future.

1   Introduction

Connected tech and the creative industries

1.   The creative and entertainment potentials of emerging technologies are expansive. Connected devices are increasingly used to distribute digital content. Smart speakers, for example, are a significant and fast-growing proportion of the audio market, accounting for 10 percent of time spent listening to radio and underpinning the rise in the overall share of UK radio listening taking place through online platforms, which rose from 11 percent in early 2019 to 22.4 percent in early 2022.[1] This is likely to increase further as the number of connected cars increases, with two-thirds of new cars expected to have on-board voice assistants by the end of 2023.[2] Similarly, almost four-fifths of homes in the UK now have at least one connected TV, making subscription video-on-demand as readily available as linear broadcasting for them.[3] Performance venues, galleries, museums and other cultural institutions are finding new audiences by offering immersive physical experiences and streaming through online platforms.

2.   Beyond the everyday applications, emerging technology is also directly and indirectly impacting other areas. In professional sport, wearable technology, artificial intelligence (AI) and augmented reality (AR) can, for example, provide real-time data on performance and amalgamate practice and film study for athletes,[4] support referees and officials[5] and can enhance the fan experience through gaming, simulators, and immersive broadcasts from 360° cameras.[6] Many augmented and virtual reality (VR) experiences utilise functionality already built into smartphones, such as touchscreens, mobile data, front- and rear-mounted high-quality cameras and in-built sensors and location tools. The National Gallery, for example, has released a smartphone-based app called "The Keeper of Paintings", which uses an AR interface to that encourage children to explore the Gallery's collection of paintings.[7] Other companies are releasing bespoke hardware such as VR headsets: Meta has sold approximately twenty million Quest headsets to date, and plans to launch additional lines, including AR glasses, in the coming years;[8] video game developers Valve and Sony Interactive Entertainment are currently manufacturing their own headsets for immersive gaming; and Apple has recently unveiled its own venture in AR/VR hardware (which the company describes as a "spatial computer") with its Vision Pro.[9] In Apple's case, the Vision Pro is the first major hardware product the company has launched in eight years, since 2015's release of the Apple Watch, signalling that the market for AR/VR products will be important for manufacturers in future regardless of how novel or contrived they may seem to the public.

3.   Alongside the benefits of new creative and entertainment technology, there are risks and challenges. Representatives from the radio sector raised concerns with us that the impact of voice-enabled devices will undermine the findability and prominence of radio,

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1   Radiocentre (TEC0058)
2   News UK (TEC0063)
3   News UK (TEC0063)
4   Massachusetts Institute of Technology, 'Smart sports', accessed 19 June 2023
5   "*Revolutionizing Sports With Augmented Reality*", Forbes, 26 October 2019
6   "*How virtual reality is transforming the sports industry*", TechCrunch, 16 September 2016
7   The National Gallery, 'The Keeper of Paintings and the Palette of Perception', accessed 19 June 2023
8   "*This is Meta's AR / VR hardware roadmap for the next four years*", The Verge, 1 March 2023
9   "*Vision Pro: Apple's new augmented reality headset unveiled*", BBC News, 6 June 2023

lead to overlaying of advertising across third-party audio streams and enable monopolies on listener data, which in turn may threaten the viability, sustainability and plurality of both public service and commercial radio.[10] We have discussed the issue of prominence in our reports on *The future of public service broadcasting*[11] and *Economics of music streaming*[12] and have considered the impacts on radio as part of our pre-legislative scrutiny of the draft Media Bill.[13] Similarly, connected TVs' dynamic user interfaces have already outdated the statutory prominence framework for electronic programming guides (EPGs), which the draft Media Bill is seeking to remedy.[14] As our first report on connected tech, *Connected tech: smart or sinister*, discussed, children are more vulnerable when using connected devices, including connected toys, due to the lack of ownership, control and education about such devices and because privacy policies often not set out in child-friendly terms.[15] Finally, evidence from Internet Matters, a not-for-profit organisation launched by internet service providers BT, Sky, TalkTalk and Virgin Media, has argued that online safety will remain a significant concern, as "early evidence suggests that virtual reality poses particular threats over and above familiar online harms" due to the potentially more visceral experiences facilitated by the technology.[16]

Our inquiry

4.   We launched our inquiry in May 2022 to consider the applications of connected devices and the potential benefits and harms as a result. We received over sixty written submissions and held six evidence sessions with stakeholders and representatives from academia, civil society, the tech sector, the creative industries, the Information Commissioner's Office (ICO) and Government. This inquiry follows the work we undertook since 2020 through our Sub-Committee on Online Harms and Disinformation on *Online harms and the ethics of data*.[17] We also visited South Korea (as well as for our *Promoting Britain abroad*[18] and online safety[19] inquiries), which is a tech manufacturing powerhouse and global cultural exporter, where we met with parliamentarians, officials, content creators, device manufacturers and digital infrastructure providers, and the ABBA Arena in Newham, where we met with producers exploring the entertainment potentials of emerging technology. We are grateful to everyone who contributed to this inquiry.

5.   After we concluded taking oral evidence, the Government announced that changes to the remits of several departments, including the Department for Culture, Media and Sport (DCMS). This resulted in the creation of a dedicated Department for Science, Innovation and Technology (DSIT), and the transfer of the digital and technology policy

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10   Radiocentre (TEC0058), News UK (TEC0063)

11   Digital, Culture, Media & Sport Committee, Sixth Report of Session 2019–21, *The future of public service broadcasting*, HC 156, paras 73–88

12   Digital, Culture, Media & Sport Committee, Second Report of Session 2021–22, *Economics of music streaming*, HC 156, para 160

13   Culture, Media & Sport Committee, 'Pre-legislative scrutiny of the Draft Media Bill,' accessed 4 July 2023

14   News UK (TEC0063)

15   Culture, Media & Sport Committee, Tenth Report of Session 2022–23, *Connected tech: smart or sinister?*, HC 157, paras 37–8, 42–52

16   Internet Matters (TEC0044)

17   Culture, Media & Sport Sub-Committee on Online Harms and Disinformation, 'Online harms and the ethics of data,' accessed 31 May 2023

18   Digital, Culture, Media & Sport Committee, Second Report of Session 2022–23, *Promoting Britain abroad*, HC 156

19   Culture, Media & Sport Sub-Committee on Online Harms and Disinformation, 'Online safety and online harms,' accessed 31 May 2023

portfolio and some of DCMS's arms-length bodies—including Ofcom and the ICO—to DSIT. However, as we make clear, there is a strong intersection between digital and tech policy and the culture, media and sport sectors. As such, we retain an ongoing interest in matters where digital and tech policy intersects with sectors in our remit, such as music streaming, video-on-demand, gambling, mis- and disinformation and the use of AI in the creative industries.

6.   Indeed, our inquiries exploring the intersection between tech policy and culture, media and sport are continuing to have an impact. Most recently, the Government announced in May that it would be establishing a creator remuneration working group "to explore and consider industry-led actions on remuneration for existing and future creators"[20] and published a cross-industry agreement on music streaming metadata thanks to the efforts of the metadata working group.[21] We also expect the Government to publish research into equitable remuneration and the outputs (including a Code of Practice) of the industry transparency working group this summer.[22] These outputs were prompted by our July 2021 report on the *Economics of music streaming*[23] and our follow-up report published 18 months later.[24] We welcome the Government's progress in this area to date and intend to revisit this work to explore progress in the music industry and the wider implications for creative remuneration in the near future.

Our reports

7.   We have responded to changes in our remit amid our inquiry by delineating our work into two reports. Our first report, *Connected tech: smart or sinister?*, provided an overview of the benefits, barriers to realising these benefits and the harms associated with applications of connected tech, and discussed data protection and cybersecurity concerns and how devices can broaden and exacerbate patterns of domestic abuse.[25]

8.   This second report focuses on the creative and entertainment potentials of connected tech. The first chapter examines the impact of the development of AI, scrutinising the UK's proposals for regulation of AI and the implications of the proposed copyright exemptions for text and data mining (TDM), which risks reducing arts and cultural production as mere "inputs" in AI development. The second chapter discusses the applications of creative connected technology, from AR/VR to digital and AI-generated art. In particular, it looks at how the skills shortages in the creative and tech sectors are limiting the growth and potential of creative technology in the UK despite headline successes, and how AI outputs are disrupting traditional cultural production.

9.   Taken together, our reports into connected tech underline our overarching findings that while connected technology has the potential to provide new and significant benefits for the UK, it can also have serious consequences that may cause unintended harm if left unaddressed. These consequences are broad and multifaceted and require action from all

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20   "*Government announces industry progress on music streaming*", Intellectual Property Office press release, 31 May 2023

21   Intellectual Property Office, *United Kingdom Industry Agreement on Music Streaming Metadata*, 31 May 2023

22   Department for Culture, Media & Sport and Intellectual Property Office, '*The government's work on music streaming*,' accessed 10 July 2023

23   Digital, Culture, Media & Sport Committee, Second Report of Session 2021–22, *Economics of music streaming*, HC 50

24   Digital, Culture, Media & Sport Committee, Fifth Report of Session 2022–23, *Economics of music streaming: follow up*, HC 874

25   Culture, Media & Sport Committee, Tenth Report of Session 2022–23, *Connected tech: smart or sinister?*, HC 157

sides. The Government must take this seriously if the increasing prevalence of connected tech is to work for everyone.

2   Artificial intelligence

10. Artificial intelligence (AI) underpins many of the functionalities of connected devices, including enhancing data management and analytics, improving operational efficiency and enabling human interactions, including through voice-activated virtual assistants such as Amazon Alexa, Google Assistant and Siri or chatbots like ChatGPT and Bard.[26] The UK has made becoming an "AI superpower" one of its strategic priorities in recent years.[27] AI has developed at a rapid pace, with AI-powered chatbot ChatGPT and other AI tools like DALL-E, Stable Diffusion and Midjourney drawing significant media and public attention.[28] Recent advances in AI have been met with a rush to invest in companies throughout the AI supply chain. OpenAI, the company behind ChatGPT, received a reported $10 billion in a multiyear investment from Microsoft in January 2023[29] and was valued between $27–29 billion following a funding round that closed in April 2023.[30] Nvidia, an American multinational chip designer whose hardware is used to power AI applications, became the first chipmaker to reach a valuation of $1 trillion based on a surge in investment following forecasts that the company would net $11 billion in sales between May and July 2023.[31]

What is "artificial intelligence"?

11. There is no universally-agreed definition of AI; indeed, definitions can vary significantly. The Government Office for Science has defined AI as "[referring] to the analysis of data to model some aspect of the world" where "inferences from these models are then used to predict and anticipate possible future events".[32] The International Organisation for Standardisation (ISO) and International Electrotechnical Commission (IEC) instead define AI as an "engineered system that generates outputs such as content, forecasts, recommendations or decisions for a given set of human-defined objectives".[33] The Organisation for Economic Co-operation and Development (OECD) uses both a general definition and relevant use cases, defining AI as "a machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations, or decisions influencing real or virtual environments" with seven uses: hyper-personalisation, human interaction, pattern and anomaly detection, recognition (i.e., facial recognition, healthcare diagnoses, etc), goal driven systems, predictive analytics/decision support, and autonomous systems.[34] Generative AI, which refers to AI that generate images, text and other types of media in response to prompts (such as ChatGPT, DALL-E and Midjourney), combine several of these use-cases.

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26   *Artificial Intelligence and Automation in the UK*, Briefing Paper [CBP8152](), House of Commons Library, 21 December 2017

27   "[New ten-year plan to make the UK a global AI superpower]()", Department for Digital, Culture, Media & Sport press release, 22 September 2021

28   "[Beyond ChatGPT: 14 Mind-Blowing AI Tools Everyone Should Be Trying Out Now]()", Forbes, 28 February 2023

29   "[Microsoft Confirms Its $10 Billion Investment Into ChatGPT, Changing How Microsoft Competes With Google, Apple And Other Tech Giants]()", Forbes, 27 January 2023

30   "[OpenAI closes $300M share sale at $27B-29B valuation]()", TechCrunch, 29 April 2023

31   "[Nvidia hits $1tn market cap as chipmaker rides AI wave]()", Financial Times, 30 May 2023

32   Government Office for Science, *[Artificial Intelligence: opportunities and implications for the future of decision-making]()*, November 2016, p 5

33   International Organisation for Standardisation, '[ISO/IEC 22989: Information technology — Artificial intelligence — concepts and terminology](),' accessed 5 January 2023

34   Organisation for Economic Co-Operation and Development, [Artificial Intelligence and Responsible Business Conduct](), 4 November 2019, pp 1–3

12.   The Government's 2022 AI Regulation policy paper demurred entirely from providing a general definition of AI, instead setting out two core characteristics for regulation to address: adaptiveness ("[operating] on the basis of instructions which have not been expressly programmed with human intent") and autonomy ("decisions […] made without express intent or the ongoing control of a human").[35] Its 2023 AI Regulation White Paper, published after our evidence gathering concluded, restated that the Government would proceed by defining AI with reference to these two characteristics "to support regulator coordination".[36]

13.   AI is often broadly categorised into two types:

- "Narrow AI" (also called "applied" or "weak AI"), which is only good at a particular task; and

- "Artificial general intelligence", or AGI (also known as "full" or "strong AI"), which is a hypothetical type of system capable of attempting "more or less any problem a human can".[37]

The categorisation of AGI, however, is a contested topic, with little consensus among many industry professionals, researchers and commentators about its definition, timeline for development or even whether it can be achieved.[38] Nonetheless, OpenAI[39] and Google DeepMind[40], a UK-based Google subsidiary researching AI, both hope to create human-like machine intelligences.

14.   AI is underpinned by several technologies that enable its adaptiveness and autonomy. Algorithms, which are simply sets of rules and instructions that a system follows in order to perform a certain task, form the programming that tells the system how to operate on its own.[41] Machine learning (ML), which refers to the use of statistical methods to leverage (typically large quantities of) data to evaluate and improve a system's performance in a supervised and/or unsupervised manner (i.e., where data is labelled by a human or unlabelled), allows a system to learn from "experience".[42] Deep learning is a more modern type of machine learning, using artificial neural networks, where processors are linked together like neurons and synapses in the human brain.[43] There have been recent breakthroughs in types of deep learning methods called large language models (LLMs), which use powerful neural networks called transformer models that learn context and meaning by tracking relationships in sequential data (such as relationships between words in a phrase or sentence).[44] LLMs can recognise, summarise, translate and generate content

35   Department for Digital, Culture, Media & Sport and Department for Business, Energy & Industrial Strategy, *Establishing a pro-innovation approach to regulating AI*, CP 728, July 2022

36   Department for Science, Technology & Innovation and Office for Artificial Intelligence, *A pro-innovation approach to AI regulation*, CP 815, 29 March 2023

37   *Artificial Intelligence and Automation in the UK*, Briefing Paper CBP8152, House of Commons Library, 21 December 2017

38   MIT Technology Review, *Artificial general intelligence: Are we close, and does it even make sense to try?* (15 October 2023)

39   MIT Technology Review, *The messy, secretive reality behind OpenAI's bid to save the world* (17 February 2020)

40   MIT Technology Review, *How Google Plans to Solve Artificial Intelligence* (31 March 2016)

41   *Artificial Intelligence and Automation in the UK*, Briefing Paper CBP8152, House of Commons Library, 21 December 2017

42   *Remote sensing and machine learning*, POSTnote 628, Parliamentary Office of Science and Technology, June 2022

43   Ibid.

44   Nvidia, 'What is a transformer model?,' accessed 9 June 2023

from massive (internet-scale) datasets with hundreds of billions of parameters;[45] it is OpenAI's LLMs, GPT-3.5 and GPT-4, that are the foundation for its generative AI chatbot ChatGPT.[46]

Regulating artificial intelligence

The case for regulation

15.   The breadth of applications of connected tech, let alone of AI more widely, means that there are also a wide range of risks, depending on how the technology is used. Carly Kind, Director of the research organisation the Ada Lovelace Institute, provided several examples of how machine learning and AI-enabled technologies had caused harm during our *Online harms and the ethics of data* inquiry, including:

- Discriminatory pricing on ride-hailing apps like Uber and Lyft for communities of colour;[47]

- A US-based system used to assess whether or not patients would need and should be recommended further care was found to be discriminating against black patients relative to white patients in otherwise factually equivalent cases, due to the system being trained on health insurance data that showed which patients spent more money on healthcare and were better insured overall;[48] and

- Discriminatory targeting of adverts in the job market.[49]

The Government has provided an illustrative list of risks in its 2023 White Paper, including risks to human rights, safety, fairness, privacy and agency, societal wellbeing and security.[50]

The UK's approach

16.   The 2023 AI Regulation White Paper sets out what the Government has characterised as a "context-specific", sectoral framework for regulation of AI.[51] The Government will regulate "based on the outcomes AI is likely to generate in particular applications", allowing sector regulators "to weigh the risks of using AI against the costs of missing opportunities to do so", rather than classifying all applications of AI as *prima facie* high risk.[52] The White Paper also identifies potential capability gaps among regulators, including AI expertise and organisational capacity, and the Government has therefore "prioritised the ongoing assessment of the different capability needs across the regulatory landscape".[53] This critique has been reiterated by the Ada Lovelace Institute who have argued that "the UK will […] struggle to effectively regulate different uses of AI across sectors without

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45   Nvidia, 'Large Language Models Explained,' accessed 9 June 2023

46   OpenAI, 'GPT-4,' accessed 9 June 2023

47   Oral evidence taken before the Digital, Culture, Media & Sport Sub-Committee on Online Harms and Disinformation on 13 October 2020, HC (2020–21) 646, Q177

48   Ibid., Q201

49   Ibid., Q216; see also "*Facebook accused of allowing sexist job advertising*", BBC News, 9 September 2021

50   Department for Science, Technology & Innovation and Office for Artificial Intelligence, *A pro-innovation approach to AI regulation*, CP 815, 29 March 2023

51   Ibid.

52   Ibid.

53   Ibid.

substantial investment in its existing regulators".[54] As Carly Kind told us, "the platforms have a monopoly on excellent talent coming through computer science, for example, but also in other disciplines" as "regulators simply cannot offer the incentives and salary to join that a Google or a Facebook can".[55] However, these assessments may change given the worldwide tech sector job cuts throughout 2022 and 2023 due to economic disruption and market shifts.[56]

17. The Government's framework is underpinned by five cross-sector principles, which aim "to guide regulator responses to AI risks and opportunities":

- **Safety, security and robustness** (AI systems are technically secure and function as intended throughout their life cycle);

- **Appropriate transparency and explainability** (information, such as how, when and what AI is used for, is communicated to relevant people, and relevant people should be able to access, interpret and understand an AI's decision-making processes);

- **Fairness** (AI should not undermine the legal rights of individuals or organisations, discriminate unfairly against individuals or create unfair market outcomes);

- **Accountability and governance** (the supply and use of AI should include effective oversight and clear lines of accountability); and

- **Contestability and redress** (relevant people should be able to contest an AI decision or outcome that is harmful or creates material risk of harm).[57]

These principles broadly align with the OECD's four principles on artificial intelligence, which were adopted in May 2019 by member countries, including the UK.[58] The Government's White Paper states that these principles will not initially be put on a statutory footing, but that it "anticipates introducing a statutory duty on regulators requiring them to have due regard to the principles" following an initial period of implementation and "when parliamentary time allows".[59]

18. The regulatory regime will be further buttressed from within government, which will provide "central support functions required to make sure that the overall framework offers a proportionate but effective response to risk while promoting innovation across the regulatory landscape".[60] These functions include monitoring the regime's effectiveness, assessing risks, horizon-scanning, supporting testbed and sandbox initiatives (i.e., services for innovators to test novel products against regulatory standards before they go to market) and education and awareness, and promoting regulatory cohesion with

54   "*UK rules out new AI regulator*", BBC, 29 March 2023

55   Oral evidence taken before the Digital, Culture, Media & Sport Sub-Committee on Online Harms and Disinformation on 13 October 2020, HC (2020–21) 646, Q178

56   "*What is behind the big tech companies' job cuts?*", BBC News, 16 November 2022

57   Department for Science, Technology & Innovation and Office for Artificial Intelligence, *A pro-innovation approach to AI regulation*, CP 815, 29 March 2023

58   Organisation for Economic Co-operation and Development, Recommendation of the Council on Artificial Intelligence, accessed 12 April 2023

59   Department for Science, Technology & Innovation and Office for Artificial Intelligence, *A pro-innovation approach to AI regulation*, CP 815, 29 March 2023

60   Ibid.

international frameworks.[61] The Government also established its expectations for the Digital Regulation Co-operation Forum (DRCF), which brings together the ICO, Ofcom, the Competition and Markets Authority and Financial Conduct Authority to ensure a greater level of co-ordination in regulating online platforms and digital services. A letter from Michelle Donelan MP, the Secretary of State for Science, Innovation and Technology, to the DRCF's then-Interim CEO Bethan Watts[62] and the four DRCF member regulators' CEOs, set out three areas that it expected the Forum to have a role, namely: facilitating cross-regulator engagement on the five AI principles; horizon scanning for new technologies; and establishing a new multi-regulator, cross-sectoral AI sandbox.[63] In response, Bethan Watts confirmed that "the DRCF will make a concerted effort to involve other regulators within the activities we have planned as part of our 2023/24 work programme" such as inviting non-DRCF members to discussions about AI principles or generative AI, but did not commit to any substantial work with non-DRCF regulators.[64]

19. **We welcome the Government's sensible proposals for regulating AI, including taking a sectoral approach underpinned by six cross-sector principles. However, there are outstanding weaknesses with this approach that the Government should clarify, including ensuring that sector regulators who do not currently regulate in the tech sector will build up technical expertise and are working in a joined-up manner.**

20. *The Government should set out a plan to provide upskilling and resourcing for non-digital sector regulators to ensure they can meet the needs of the new cross-sector regulatory regime for AI.*

21. **The Government has announced that it intends to take on a central support role to buttress the regime for AI regulation and provide cross-sector cohesion.** *The Government should establish a discrete AI regulation co-ordination unit within Whitehall to ensure coherent working and enable robust stakeholder engagement. This unit should publish regular reports to enable Parliament to fully consider the progress of the regime's introduction and implementation.*

Text and data mining

22. AI is underpinned by machine learning, which requires the inputting of large amounts of data to identify and extrapolate correlations, relationships, patterns and trends in that data that can then be used to make inferences, predictions, decisions and recommendations in the future. The process of identifying this information from large data sets is called "data mining" (also known as "knowledge discovery in data");[65] similarly, "text mining" refers to the process of identifying this information from textual materials.[66] There are several broad types of machine learning approaches, including: supervised learning, where algorithms initially analyse data sets that have been cleaned, structured and contextualised into a "training dataset" by a human "trainer";[67] unsupervised learning, where algorithms analyse unlabelled data sets; semi-supervised learning, where the

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61   Ibid.

62   Kate Jones has since been appointed as CEO of the DRCF and started on 2 May 2023.

63   Department for Science, Innovation & Technology and Office for Artificial Intelligence, *A pro-innovation approach to regulating AI: Secretary of State letter to DCRF, March 2023* (17 March 2023), pp 2–3

64   Digital Regulation Co-operation Forum, *Letter to Secretary of State for DSIT, 5 April 2023* (5 April 2023), pp 2–3

65   IBM, 'What is data mining?,' accessed 18 April 2023

66   IBM, 'Text mining,' accessed 18 April 2023

67   IBM, 'Data labelling,' accessed 18 April 2023

training dataset includes both labelled and unlabelled data; and reinforcement learning, where algorithms continually optimise performance based on feedback about its outputs.[68] Textual information and other types of data therefore form the raw materials that are used to test and improve both AI systems and machine learning techniques themselves.

23.   The need for large datasets means that text and data mining (TDM) systems often need to copy copyrighted works for analysis, including for training and development purposes. In UK law, the making of such copies constitutes a copyright infringement unless permitted under licence or exemption.[69] Currently, the Copyright, Designs and Patents Act 1988 provides a limited exemption to copyright by allowing TDM for non-commercial research use only. This was introduced through The Copyright and Rights in Performances (Research, Education, Libraries and Archives) Regulations 2014[70] and followed Article 5 of the European Union's Information Society Directive.[71]

24.   In September 2020, the Intellectual Property Office (IPO) announced that it would be consulting on how the UK's intellectual property regime could encourage the use and development of AI[72] in support of the Government's wider vision for the UK to be a "global leader in [AI] technology" as set out in its 2018 AI Sector Deal.[73] Despite mixed views both on the adequacy and flexibility of the regime and the need for reform,[74] the IPO launched a further consultation in October 2021 on options in three areas: copyright protections for computer-generated works; patent protection for AI-devised inventions; and, further exemptions to copyright for TDM.[75] The IPO responded to the consultation in June 2022, proposing no immediate changes to UK law on computer-generated inventions and patent protection; however, for TDM, it asserted that "we plan to introduce a new copyright and database exception which allows TDM for any purpose".[76] It cited several territories with broad or limited TDM exemptions in its rationale, including the EU, Japan, Singapore and the US.[77]

25.   This "any purpose" exemption was proposed despite concerns raised by copyright owners during the initial 2020 consultation period, who "expressed concerns about moving towards an exception that would allow commercial TDM" and "believed that this could prejudice their legitimate interests" and "would shift the balance unfairly against creators".[78] Since 2020, representatives from across the creative industries—from literary authors to visual artists to musicians—have continued to voice concerns, particularly with the recent advancements in generative AI.[79] Last year, Jamie Njoku-Goodwin, CEO

68   Amazon, 'What is machine learning?,' accessed 18 April 2023

69   Intellectual Property Office, *Artificial Intelligence and Intellectual Property: copyright and patents: Government response to consultation*, 28 June 2022

70   The Copyright and Rights in Performances (Research, Education, Libraries and Archives) Regulations 2014, regulation 3; Copyright, Designs and Patents Act 1988, section 29A

71   Directive 2001/29/EC, Article 5

72   Intellectual Property Office, *Government response to call for views on artificial intelligence and intellectual property*, 23 March 2021

73   Department for Business, Energy & Industrial Strategy and Department for Digital, Culture, Media & Sport, *AI Sector Deal*, 26 April 2018

74   Intellectual Property Office, *Government response to call for views on artificial intelligence and intellectual property*, 23 March 2021

75   Intellectual Property Office, 'Artificial Intelligence and IP: copyright and patents,' accessed 18 April 2023

76   Intellectual Property Office, *Artificial Intelligence and Intellectual Property: copyright and patents: Government response to consultation*, 28 June 2022

77   Ibid.

78   Intellectual Property Office, *Government response to call for views on artificial intelligence and intellectual property*, 23 March 2021

79   "*Generative AI should pay human artists for training*", Financial Times, 27 January 2023

of the British music industry's trade body UK Music, described the plans as a "green light to music laundering", where "AI companies to essentially take music they do not own, use copies of it to train an AI, and then reap the commercial rewards with a legally 'clean' new song".[80] Universal Music, the world's largest music group, has previously warned of "widespread and lasting harm" if creator rights and compensation were undermined by AI;[81] Universal's CEO, Sir Lucian Grainge, reportedly told Chancellor of the Exchequer, Rt. Hon. Jeremy Hunt MP, that "it would be a strange state of affairs if the UK were to choose a regulatory framework that was less committed to basic property rights than the Chinese Communist Party's".[82]

Impact on the creative industries

26. Throughout our inquiry, we considered the impact that a broad TDM exemption would have on the creative industries. Svana Gisla, producer of the virtual concert residency ABBA Voyage (discussed further in Chapter 2), described the exemption as "terrible", asserting that "our emerging, new and existing artists have a hard enough time surviving in life, let alone if they have to compete against computers on top of that".[83] Dr Yiyun Kang, artist and Assistant Professor at the Korea Advanced Institute of Science & Technology (KAIST), opined that "I don't personally love the idea" but speculated that the policy change may happen in "most countries" and was therefore "about how to do it, what sets of boundaries [and] which kinds of data we have access to".[84] Dr Matthew Cole of The Fairwork Project similarly argued in favour of creators continuing to participate in revenues generated from their intellectual property through commercial TDM, explaining that:

> There are obvious harms in allowing large corporations to mine public intellectual property or private intellectual property, whether it is music or art. If it is for profit, this is a problem if those profits are not shared with the people who have created that art. If there is a public library, public music catalogue or film, like the BFI film archives—I like to go down there and see what is available—this is a different question. It depends on how it is used.[85]

27. However, the IPO's proposals should be understood in the context of arguments made by tech companies and developers regarding access to large datasets, including copyrighted works. The IPO's TDM consultation, for example, noted that "users of copyright and database material" had agitated for a wider TDM exemption due to "the costs of licensing and difficulties in obtaining licences, especially when many rights holders are involved" and indicated that it had found compelling the arguments that investment in AI would be focused towards more permissive jurisdictions instead.[86] Additionally, we heard that companies are acquiring intellectual property through investments in arts and culture, which can be explained by the need to access works for technological development. By way of example, Dr Kang told us that:

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80   "*No 10 is giving a green light to music laundering*", The Times, 6 July 2022

81   "*AI song generators threaten 'lasting harm' to artists, warns Universal*", The Telegraph, 12 February 2023

82   "*AI music is danger to artists, Universal chief tells Hunt*", The Telegraph, 21 May 2023

83   Qq258–259

84   Qq260–261

85   Q169

86   Intellectual Property Office, *Artificial Intelligence and Intellectual Property: copyright and patents: Government response to consultation*, 28 June 2022

at the [Royal College of Art] we have a co-operative project with LG, a company in Korea. It has donated 18 OLED panels. That includes transparent panels, transparent TV, which is the cutting-edge technology that is available at the moment.

The main reason that LG is doing this project is particularly acquiring the IP of the students' works. It is in fact the property of the students, but in the meantime, the content of the winning students' work can be shared with LG if it wants to use it during the next five years. IP is a critical issue at the moment.[87]

Government response

28. In response to concerns raised by the creative industries and parliamentarians, including our Committee, about the TDM exemption, the Government appears to have changed course. Julia Lopez MP, jointly a Minister of State in DCMS and DSIT, reflected on the process in evidence to us by noting that the consultation "probably surprised the IPO in terms of the level of concern that was expressed in the creative industries".[88] Minister Lopez continued that "I am pretty confident that some of the options that were looked at by the IPO to try and create a more permissive environment for AI in this space will not be taken forward".[89] This shift was confirmed during a Westminster Hall debate on artificial intelligence and intellectual property rights held the day after our final hearing in this inquiry. George Freeman MP, Minister of State in the then-Department for Business, Energy and Industrial Strategy (BEIS), stated:

> Although the Government needs to be on the front foot in anticipating the regulatory framework and getting it right, the proposals have clearly elicited a response that we did not hear when they were being drafted. We have taken the responses seriously. The Minister responsible for this area—my Honourable Friend the Member for Hornchurch and Upminster [Minister Lopez]—and I have made it clear that we do not want to proceed with the original proposals. We will engage seriously, cross-party and with the industry, through the IPO, to ensure that we can, when needed, frame proposals that will command the support required.[90]

29. The Government has since tried to assuage the creative industries' ongoing concerns on the use of copyrighted works in the development of AI. A report from the *Pro-Innovation Regulation of Technologies Review*, undertaken by Sir Patrick Vallance, the Government's Chief Scientific Adviser, recommended that "Government should announce a clear policy position on the relationship between intellectual property law and generative AI to provide confidence to innovators and investors".[91] The report expanded on this recommendation, saying that "to increase confidence and accessibility of protection to copyright holders of their content as permitted by law, we recommend that the Government requires the IPO to provide clearer guidance to AI firms as to their legal responsibilities, to coordinate

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87   Q261
88   Q404
89   Ibid.
90   HC Deb, 1 February 2023, col 166WH [Westminster Hall]
91   Pro-innovation Regulation of Technologies Review, *Digital Technologies* (March 2023), p 8

intelligence on systematic copyright infringement by AI, and to encourage development of AI tools to help enforce IP rights".[92] The Government has since announced that it will take forward this recommendation.[93]

30. **We are pleased that the Government has been listening to stakeholders on text and data mining intellectual property for commercial benefit and we are encouraged that Ministers are looking again at this. The current framework, which provides an exemption for text and data mining for non-commercial research purposes and otherwise allows creators to licence their work for any further purpose, provides an appropriate balance between innovation and creator rights.**

31. *We recommend that the Government does not pursue plans for a broad text and data mining exemption to copyright. Instead, the Government should proactively support small AI developers in particular, who may find difficulties in acquiring licences, by reviewing how licensing schemes can be introduced for technical material and how mutually-beneficial arrangements can be struck with rights management organisations and creative industries trade bodies. The Government should support the continuance of a strong copyright regime in the UK and be clear that licences are required to use copyrighted content in AI. In line with our previous work, this Committee also believes that the Government should act to ensure that creators are well rewarded in the copyright regime.*

32. *The Government must work to regain the trust of the creative industries following its abortive attempt to introduce a broad text and data mining exemption. The Government should consider how creatives can ensure transparency and, if necessary, recourse and redress if they suspect that AI developers are wrongfully using their works in AI development.*

33. **The Government's initial handing of the text and data mining exemption to copyright for AI development, though eventually correct, shows a clear lack of understanding of the needs of the UK's creative industries. All branches of Government need to better understand the impact of AI, and technology more broadly, on the creative industries and be able to defend their interests consistently. We will continue to look on the Government's progress with interest.** *The Government should provide a substantive update on its direction in managing the impact of AI on the creative industries and any discussions on these matters by the end of 2023.*

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92   Ibid., p 9

93   Department for Science, Technology & Innovation and Office for Artificial Intelligence, *A pro-innovation approach to AI regulation*, CP 815, 29 March 2023

3   Creative technology

34.   Creative technology (often referred to as "CreaTech") describes technology that enables the creative industries to produce new experiences, services, products and other forms of cultural activity. CreaTech intersects two of the most significant, dynamic and fastest growing sectors in the UK economy: the creative industries and digital and tech sector. These sectors contributed £115.9 billion and £150.9 billion respectively in 2019 alone.[94] As such, the UK is a creative technology hub. In 2020, CreaTech companies attracted almost £1 billion in venture capital (VC) funding, up 22 percent from 2019, behind only the US and China worldwide and twice as much as the next biggest European market.[95] CreaTech VC investment constituted over 9 percent of the total tech sector investment in the same year.[96] Tech Nation, formerly a government-backed organisation (since acquired by the Founders Forum Group after Tech Nation's grant funding was cut) that supports the UK tech ecosystem, has projected that CreaTech and Climate Tech will be the two leading tech sectors based on VC capital growth.[97] Despite this, CreaTech companies tend to be more reliant on early-stage sources of finance than non-CreaTech companies and tend to raise between 22 and 34 percent less funding on average.[98]

35.   CreaTech encompasses the creative applications of AI, 5G, AR/VR and other technologies in domains including arts, crafts and design, fashion, music, film and television, museums, architecture, computing, gaming and e-sports, and marketing.[99] The Fashion Innovation Agency at the London College of Fashion, University of the Arts London, has experimented with artificial intelligence, digitisation and AR/VR for projects in forecasting fashion trends, immersive catwalks and showrooms, and sustainable e-commerce,[100] while InFashion Technologies has been leveraging machine learning and other technologies to develop a fashion personalisation platform since 2019.[101] Draw & Code, which uses emerging tech like AR, VR and projection mapping (see paragraphs 41–44) to create immersive experiences, has been commissioned by brands such as John Lewis, Philips, Hyundai, Mercedes and Marks & Spencer to help showcase existing and future products and services, among other partners.[102] New technologies are transforming architectural practice, ranging from 3D visualisation and rendering technology, which can enable collaborative workflows and better design option presentations,[103] to computer modelling, which can autogenerate design aspects, and drone based surveying, which can help conservation efforts.[104]

36.   It is difficult to predict what the next CreaTech success story will be. In recent years, discussions about creative technology have pivoted to massive, shared virtual environments, also referred to as "the metaverse", which describes hypothetical iterations of the internet and/or computer systems that are represented as a single, immersive, holistic

94   "*How CreaTech added 1+1 to make £981m*", Creative Industries Council, 15 March 2021
95   Tech Nation, *The CreaTech Report 2021: Part 1* (March 2021)
96   Ibid.
97   Tech Nation, *The CreaTech Report 2021: Part 2* (March 2021)
98   Creative Industries Policy and Evidence Centre, *Createch Activity in the UK* (20 September 2021)
99   "*What is CreaTech and where are people investing?*", Technology Magazine, 16 April 2021
100   Fashion Innovation Agency, 'About us', accessed 5 July 2023
101   Creative Industries Council, 'Ones To Watch 2021 Showcase: InFashion Technologies Ltd.', accessed 5 July 2023
102   Draw & Code, 'Projects', accessed 5 July 2023
103   Royal Institute of British Architects, 'How real-time technology in the gaming industry is helping to transform 3D visualisation in architecture', 1 December 2022
104   Royal Institute of British Architects, 'How digital technology is transforming architectural practice', 17 January 2019

virtual world where users can socialise, work and play and access a range of other services and experiences.[105] However, commentators have often observed that these ambitions are not entirely new, with *Second Life*, a massive online virtual world launched in 2003, cited as a notable comparison.[106] In October 2021, Facebook rebranded as "Meta" as part of a declaration of intent to expand beyond its existing social media apps and build its own metaverse platform.[107] Interest in shared virtual environments has waxed and waned, even amongst the biggest purveyors such as Meta: advances in other technologies, such as generative AI, capture the zeitgeist and become a priority for investment,[108] only for advances in AR/VR headsets to renew discussions.[109] Given the considerable interest in technologies like the metaverse and generative AI, it is important that the Government ensures that it responds appropriately to these emerging technologies, while also recognising that there is much more to CreaTech.

Applications of creative technology

37.   Despite the interest in a few high-profile emerging technologies, there is a wide range of applications for creative technology. Our inquiry presented the opportunity to consider several case studies, which have shaped our conclusions and recommendations about creative technology. These case studies show just three of many different ways that the creative industries are using technology to develop new, immersive cultural experiences.

Case study: tech and entertainment companies in South Korea

38.   South Korea (officially the Republic of Korea, or ROK) is a global leader in science and technology, cultural production and tourism and a key strategic and economic partner for the UK.[110] South Korea is one of the world's largest exporters of electronics, ranging from semiconductors, memory components and displays to smartphones, TVs and home appliances. In 2019, it became the first country to launch a nationwide 5G network and commercialise 5G services, which enable faster connectivity for faster cloud processing, having already had one of the highest rates of smartphone penetration in the world.[111] The government of the Republic of Korea has recently committed to investing more than $800 million over the next five years to foster its domestic industry in AI chip research, development and manufacturing, which will be integral for advances in and manufacturing of connected tech.[112] South Korea has also leveraged technologies such as social media, streaming and online gaming to become a major global cultural exporter to new fans, consumers and markets in the last 25 years in what is referred to as "the Korean wave" ("*Hallyu*", coined by Chinese media in 1998).[113] Two UK-ROK Creative Industries Forums, held in 2014 and 2016 respectively, demonstrates the UK's recognition of the Korean creative sector's technological strengths in music, visual effects and animation.[114]

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105   "*Apparently, it's the next big thing. What is the metaverse?*", BBC News, 18 October 2021

106   "*Second Life joins the metaverse discussion with the return of its founder — and some key patents*", The Verge, 13 January 2022

107   "*Facebook changes its name to Meta in major rebrand*", BBC News, 28 October 2021

108   "*It's a tough time for Meta. Can AI help make the company relevant again?*", The Guardian, 11 May 2023

109   "*Apple's Vision Pro headset has made the metaverse feel outdated*", Financial Times, 9 June 2023

110   "*UK and South Korea eye bigger deal following bumper year of trade*", Department for International Trade press release, 7 February 2022

111   "*S. Korea first to roll out 5G services, beating U.S. and China*", Reuters, 3 April 2019

112   "*Exclusive: South Korea aims to join AI race as start-up Rebellions launches new chip*", Reuters, 13 February 2023

113   Sangjoon Lee and Abé Markus Nornes, *Hallyu 2.0: The Korean Wave in the Age of Social Media* (Ann Arbor, 2015), pp 1–10

114   "*UK-ROK Creative Industries Forum*", Department for Digital, Culture, Media & Sport and UK Trade & Investment, 10 March 2016

39. Engaging with stakeholders across the tech and creative sectors during our visit to South Korea, we heard how companies have made a priority of leveraging the entertainment potentials of new technology. Representatives at SK Telecom (SKT), one of the country's *chaebols* (large, diversified industrial conglomerates) and its largest wireless telecommunications operator, discussed its ambitions to develop its own metaverse platform as part of its broader development of connected technology and digital infrastructure. SKT has since rolled out its metaverse platform "Ifland" to 49 countries worldwide, with Emirati tech company e& and Singaporean telecommunications group Singtel named as global partners.[115] SKT has also signed a memorandum of understanding with Japanese mobile operator NTT Docomo to explore co-operation on joint production of virtual content and possibilities for connecting the companies' respective platforms.[116]

40. Stakeholders in South Korea with commercial interests across music, TV, film and other creative industries told us that media and entertainment companies had embraced emerging tech and were continually exploring how content could be optimised for AR/VR and metaverse platforms in future. SM Entertainment, for example, told us how immersive technology could enhance the content and concepts of their repertoire, as evidenced by their K-Pop girl group æspa, who debuted with a digital/metaverse theme and aesthetic, as well as fan engagement and participation. It was speculated that even publishers of webtoons (Korean digital comics optimised for smartphone and tablet screens and incorporating vertical scroll and multimedia) have been exploring the commercial potential of the metaverse, NFTs and other technologies[117] to stay ahead of the curve as digital comic creators outside Korea have begun to embrace webtoon design. OCON Studios, who are developing immersive and interactive gaming, entertainment and fitness products, argued that to be successful, creative uses of the metaverse needed to be "physical, social and fun" to overcome the current restrictiveness of AR/VR technology. These aspirations were starkly contrasted to the US tech companies we spoke to, who professed little interest in the metaverse beyond seeing how the technology will develop.[118]

Case study: digital art

41. Focusing on virtual environments, such as the metaverse overlooks the breadth of creative experimentation with emerging and immersive technology. "Digital art" refers to the broad spectrum of creative activity where technology is used to produce and/or present arts and cultural production.[119] For example, Dr Yiyun Kang, in her capacity as the Samsung Digital Art Resident at the Victoria and Albert Museum (V&A) in London, has used digital "projection mapping",[120] where video projectors are used to turn objects into display surfaces in new creative, immersive ways, to reinterpret the Museum's historic Cast Courts, "bridging the gap between old and new technologies and recasting the courts as a spectacular animated space".[121] Used in this way, projection adds "the notion of space" to an image, just as video adds "the notion of time" to a still image.[122] As

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115 "*S. Korea's Ifland metaverse launches globally in 49 countries*", Yahoo! Finance, 23 November 2022

116 "*NTT DOCOMO and SK Telecom to Collaborate on Technological Advancement of Metaverse, Digital Media and 5G/6G*", NTT Docomo press release, 21 November 2022

117 For example, non-fungible tokens (NFTs), which are unique digital identifiers stored on distributed digital databases called blockchains that reference some underlying asset.

118 Q369

119 Victoria and Albert Museum, 'Digital art', accessed 6 March 2023; Tate, 'Digital art', accessed 6 March 2023

120 Examples of projection mapping can be found on Dr Kang's website, here.

121 Q239; see also Victoria and Albert Museum, 'Casting by Yiyun Kang', accessed 6 March 2023

122 Q235

Dr Kang told us, the use of technology "is more like expanding my language from two-dimensional painting with the physical material towards time and space together with the mixed digital reality".[123]

Figure 1: Casting, 2016, projection mapping installation at the V&A Cast Courts.

Image copyright @Yiyun Kang with courtesy of the V&A London.

42. Several local-led placemaking[124] projects and institutions across the country are putting digital art at the forefront of their cultural programmes, including in Cornwall, Stoke-on-Trent and Wolverhampton.[125] Arts Council England offers National Lottery Project Grants supporting creative and cultural work that experiments with different technologies, is created for digital platforms or is distributed digitally.[126] UK Research and Innovation has invested in three multi-year projects to develop digital innovation in the creative industries, including the £39.3m Audience of the Future Challenge in 2017 (supporting innovation in immersive technologies), the £120m Creative Industries Clusters Programme between 2018–23 (funding innovation in regional clusters in fields like digital storytelling) and the £18.9m Towards a National Collection project, for digitising the collection of UK galleries, archives and museums.[127]

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123   Q235
124   As discussed in our report on *Cultural placemaking and the levelling up agenda*, cultural placemaking refers to the role of arts, culture and heritage in shaping the local places where we live. Cultural placemaking is an important concept in the context of the wider long-term decline of town centres, high streets and public spaces across the country.
125   Cornwall Council and Cornwall & Isles of Scilly Local Enterprise Partnership (LEV0030); Bectu Union (LEV0034); Stoke-on-Trent City Council (LEV0090); Newhampton Arts Centre (LEV0105); Culture Mile (LEV0111)
126   Arts Council England, 'Using digital technology', accessed 6 March 2023
127   *The impact of digital technology on arts and culture in the UK*, POSTnote 669, Parliamentary Office of Science and Tech, May 2022

43. However, digital art may challenge the pre-existing conceptions that traditional cultural institutions have to art and culture more generally. Dr Kang noted that the V&A's acquisition of her projection mapping installation prompted a year-long study to examine the best way to preserve digital art, ranging from simple categorisation of the piece to more technical concerns such as the obsolescence of hardware and software.[128] Institutions may also face ethical difficulties in future, such as digitising or digitally regenerating collections of posthumous artists.[129]

44. While Dr Kang said that she was interested in undertaking a metaverse project, she also described several barriers, ranging from the restrictiveness of headsets, gadgets and applications to more fundamental issues with simply transitioning existing art and storytelling methods wholesale into the metaverse without fully understanding the capabilities and drawbacks of the medium.[130] She further warned that "what is happening at the moment, when it comes to the metaverse […], is it is more like money drives the content rather than the makers or the artists" and "the result is the outcomes are not thought-provoking or inspiring".[131] When asked whether the metaverse would become a dominant creative medium, she concluded that:

> I hope that that won't be the only available world for us. It is obvious that the metaverse will be a very powerful form of life that we will have in the future. That is another reason why the experiences in reality will be more precious and even more expensive to have.[132]

Case study: ABBA Voyage

45. During our inquiry we visited ABBA Voyage to learn more about how connected tech is transforming entertainment. The show is stylised as a live, virtual concert residency and features four digital avatars of ABBA performing a 22-song set as the band appeared in the 1970s. To create the digital avatars, ABBA first provided five weeks of motion capture, which was then used to choreograph a performance by younger body doubles and overlayed with the band's 1970s likeness by 800 visual effects (VFX) artists from Industrial Light & Magic (ILM) in three different studios over the span of two years.[133] ABBA Voyage producer Svana Gisla told us that the production initially explored the idea of holograms, but "aborted the idea […] pretty quickly" in favour of motion capture technology and digital avatars to recreate "a sensibility in that that is very tangible and real" by "looking for motion within the characters, […] not just the likeness".[134] The sound is provided by a ten-piece live band, with fifty-to-sixty musicians employed in total.[135] When asked about the creative decision to include a live band, Svana Gisla said that the band was a "vital" element that the team were "incredibly proud of" as "live musicians are the heart and soul of the show".[136] In terms of future developments, Svana Gisla speculated that "the technology of [the avatars] reacting to the audience is absolutely round the corner" as rendering and data transfer rates become quicker, creating even more opportunities for immersive entertainment experiences.[137]

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128   Q239
129   Q245
130   Qq246–247
131   Q247
132   Q249
133   Qq222, 224, 240, 273–274
134   Qq218, 224–225
135   Q252
136   Qq252–253
137   Q228

46. The venue for ABBA Voyage, the ABBA Arena, is a purpose-built, portable structure, designed around a 70-metre diameter performance space with a capacity of 3,000.[138] Central to the space is a 65-million-pixel screen, flanked by traditional concert-style screens showing close-ups and different angles.[139] The venue is located in Stratford, in the London Borough of Newham; Svana Gisla explained that this was "a very conscious decision", arguing that:

> We are also very passionate about the legacy of ABBA, and we have thought a lot about what we are going to leave behind when we leave and the legacy that we can contribute to the area. We felt that being in the foremost deprived borough of London was a good thing and it was a good place to be. We could arrive there, contribute to the community while we are there and hopefully leave something behind […].[140]

47. These creative decisions contrast to livestreamed and metaverse concerts. During our inquiry, into the *Economics of music streaming* two years ago, we heard how performers had already begun to livestream concerts through social media platforms like YouTube, Twitch and Facebook and online battle royale game Fortnite.[141] When asked whether she expected the metaverse to be a greater consideration for creatives in future, Svana Gisla argued that the physical venue and live band underpinned the show's emotive and social ambitions:

> We wanted an emotional experience. We like human emotion. We worry and I worry that technology has made us very insular. It is a very lonely existence to live in technology. It is made to separate people and connect them one to one with a device. We see it in our children. We see it in our grandchildren. Their social skills and interactive emotional experience of being with people and experiencing things with people is getting lost.

> For instance, we ban photography and filming in the ABBA arena because we want people to be present. You can experience things without putting a phone in front of your eye. Things do happen if you don't post them on Instagram. They still happen. People feel quite liberated when they come there and they realise that they don't have to film it and share it with all their friends. They can actually just be present and enjoy it.[142]

48. These three case studies show the value of companies and institutions embracing innovation to develop immersive creative and cultural experiences. They also demonstrate the value of different approaches, ranging from using digital technologies to reframe existing historic spaces, to recreating historic performances in the present, to creating new virtual spaces entirely from scratch. For the UK to thrive in creative tech, it needs organisations willing and able to deliver on these ambitions, and a Government that is serious about supporting innovation in these fields.

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138   Qq219–220

139   "*ABBA's successful avatar show in London offers a glimpse at a daring new direction for live music*", CNBC, 29 December 2022

140   Q219

141   Digital, Culture, Media & Sport Committee, Second Report of Session 2021–22, *Economics of music streaming*, HC 50

142   Q250

49. **While institutions are understandably investing in products such as the metaverse and generative AI, this should not be to the exclusion of novel and emerging technologies, which are enabling artists to innovate and attract audiences.** *In order to encourage a rich and diverse cultural and creative technology ecosystem, the Government and its arm's-length bodies should ensure support for the creative industries encourages artists to push the boundaries of creativity and technology and is not limited to following the narrow interests of the tech sector. Cultural institutions should be encouraged and supported by the Government to invest in, present and preserve the results of creative technology.*

Supporting creative technology

Developing technical skills

50. The development and use of creative technology is hampered by the shortage in technical skills. In our 2022 report on *Reimagining where we live: cultural placemaking and the levelling up agenda*, which discussed grassroots cultural infrastructure and social mobility within the creative industries, we raised concerns about the acute nationwide shortage in technical skills across the sector.[143] The Government's response to our report detailed several initiatives, including:

- £716 million investment in cultural education programmes between the 2016–17 and 2021–22 financial years (approximately £119 million per year);

- £115 million per annum investment in cultural education above core budgets between the 2022–23 and 2024–25 financial years;

- £30 million per year in means-tested bursaries via the Music and Dance Scheme;

- £7 million in developing flexibilities for apprenticeships (such as piloting how sectors with non-standard or short-term contracts can access apprenticeships); and

51. £3.8 billion in further education reforms (like rolling out T-Levels, reforming higher technical education and introducing Skills Bootcamps for the creative industries) over the course of the Parliament.[144]

52. Alongside these initiatives, the Government has said that it would be publishing a Cultural Education Plan in 2023, in collaboration with Arts Council England, British Film Institute and Historic England.[145] In its response, it said that the Plan will include "how best to support young people who wish to pursue careers in our creative, cultural, and heritage industries, including learnings from industry-led schools and colleges such as the BRIT School for Performing Arts and Technology and East London Arts & Music".[146] In August 2022, the Government appointed crossbench peer Baroness Bull as

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143 Digital, Culture, Media & Sport Committee, Third Report of Session 2022–23, *Reimagining where we live: cultural placemaking and the levelling up agenda*, HC 155, paras 76–78

144 Digital, Culture, Media & Sport Committee, Sixth Special Report of Session 2022–23, *Reimagining where we live: cultural placemaking and the levelling up agenda: Government Response to the Committee's Third Report*, HC 1104, pp.21–3

145 Ibid., p.22

146 Ibid.

Chair of the Expert Advisory Panel for the Cultural Education Plan.[147] However, despite the Government's promise to appoint the panel itself that autumn, members were not appointed until July of this year,[148] though the Government has maintained that the Plan will still be published in 2023.[149]

53.   While these initiatives may help to address the issues in the medium- to long-term, the short-term issues have not abated. As Robert Halfon MP, the Minister of State for Skills, Apprenticeships and Higher Education in the Department for Education (DfE), recently told the House of Lords Communications and Digital Committee, "88 percent of employers in the creative occupations find it hard to recruit higher-level skilled individuals, compared to around 38 percent of employers across the economy".[150] As Svana Gisla noted, there are several reasons underpinning the skills shortage in the creative industries, including a lack of awareness about career opportunities in the creative industries for people with technical skills, the perception that a career in the creative industries is economically unviable, unreliable and/or not a serious career, a lack of diversity within the industry, and the attractiveness of applying skills to instead attempting to launch individual pursuits such as influencing or streaming through YouTube and other platforms.[151]

54.   These issues are compounded further by practical barriers that have inhibited education and opportunities for people interested in pursuing interests in developing and working with creative technology. Dr Yiyun Kang noted, from the perspective of someone working within an educational institution, that institutions find it "almost impossible to have all the available software or hardware that students are looking for" while "at the same time, […] the technology develops so rapidly [that] almost every week there is new software, there is another version, there is another [piece of] hardware, so the school cannot keep up with everything".[152] Svana Gisla also commented that while ABBA Voyage had "slotted in" to existing initiatives targeted at improving the talent pipeline, such as apprenticeship and summer school programmes, teacher training, open days and working with the Good Growth Hub (which works with the London Legacy Development Corporation to bring young people and creative businesses together), many of these initiatives lacked the bandwidth to meet the additional demand from applicants and integrate potential partners into their schemes.[153] These capacity issues subsequently leave the full potential for such initiatives unfulfilled.

55.   **As we have repeatedly raised, the tech sector and creative industries are experiencing long-standing skills and personnel shortages that have capped the potential for growth.** *The Government's forthcoming Cultural Education Plan should explicitly discuss how educators can combine digital skills provision with creative and cultural education to nurture the next generation of digital artists, visual effects professionals and innovators in creative technology to address long-running skills shortages in the sector.*

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147   "*Baroness Bull CBE appointed Chair of the Expert Advisory Panel for the Cultural Education Plan*", Department for Digital, Culture, Media & Sport press release, 29 August 2022

148   "*Government appoints new panel to promote cultural education*", Department for Education and Department for Culture, Media & Sport press release, 3 July 2023

149   HM Government, *Cultural Education Plan Expert Advisory Panel Terms of Reference* (July 2023) p.6

150   Communications and Digital Committee, Second Report of Session 2022–23, *At risk: our creative future*, HL Paper 125, para 107

151   Qq240–242, 266

152   Q262

153   Q267

56. **The Government's Cultural Education Plan Expert Advisory Panel has only recently been appointed, almost a year after the appointment of its chair and well over six months after Government said it would appoint its members. We have serious misgivings about the Government's insistence that it will publish the Plan in 2023 as promised, which we believe will now either be rushed or late. Neither of these outcomes will serve the needs and interests of our creative industries.** *The Government must urgently clarify the scope and timescale for the Cultural Education Plan, to ensure it will deliver on its aims for the creative industries.*

Protecting intellectual property

57. Emerging technologies provide a challenge to existing protections for intellectual property enshrined in UK law. These issues are different from those discussed in Chapter 1, which concerned the use of copyrighted material as "inputs" with which AI could be trained and developed; this section considers the impact of "outputs" of AI, within the broader context of out creative technology outputs. Both Dr Kang and Svana Gisla, as creatives working in the sector, discussed the nuances of navigating intellectual property rights. Dr Kang illustrated the ethical issues, citing tensions between digitally regenerating a deceased painter's artwork and the wishes of his family who own his foundation.[154] Svana Gisla similarly noted that she "would be very selective" about posthumous shows in particular, depending on factors including the individual or organisation charged with looking after the artist's legacy, considerations about the artist's personal wishes, and the financial remuneration involved.[155]

58. In the year since our inquiry was launched, the creative potential of AI has improved exponentially, with recent AI-generated multimedia, such as an image generated by Midjourney of Pope Francis wearing a Balenciaga puffer jacket[156] and AI-produced music purportedly featuring musicians Drake and The Weeknd,[157] prompting headlines. However, this has also exacerbated concerns about the ability to establish the provenance and authenticity of online content, which has the potential to mislead or misinform with more serious consequences.[158] Furthermore, some have cited that AI may have a chilling effect for creatives. Equity, the union for performing arts and entertainment professionals, has argued that applications such as AI- and computer-generated performances, known as synthetisation, such as deepfakes (synthetic media designed to deceive), pose particular issues for performers.[159]

59. Currently, under the Copyright, Designs and Patents Act 1988, performers have rights to consent to the making of a recording of a performance and to make copies of recordings.[160] AI-generated performances fall outside the scope of these rights because performances are created without generating a recording of a performance or a copy of a recording. This should be contrasted directly to the case study of the 'ABBAtars' featured in the ABBA Voyage production, which utilises motion capture and voice recordings, were constructed with teams of digital artists, features the performance of a live band and, most importantly, was created with the approval and involvement of ABBA themselves.

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154   Q245
155   Qq243–244
156   "*The swagged-out pope is an AI fake—and an early glimpse of a new reality*", The Verge, 27 March 2023
157   "*What's really going on with 'Ghostwriter' and the AI Drake song?*", The Verge, 19 April 2023
158   "*I thought I was immune to being fooled online. Then I saw the pope in a coat*", The Guardian, 27 March 2023
159   Equity (CRF0010)
160   Copyright, Designs and Patents 1988, section 182

By contrast, a lack of legal recognition of synthetisation prevents performers from authorising the synthetisation of their own likeness or performance in their contracts.[161] Evidence from the UK Research and Innovation Trustworthy Autonomous Systems Hub and researchers from its constituent research projects called for policy guidance and development to "clarify whether and for what purpose systems may be used to generate synthetic content or manipulate image, audio, or video content, including deepfakes".[162]

60. The Beijing Treaty on Audiovisual Performances has been cited as one way of addressing these concerns. In particular, the Treaty provides "moral rights" to performers (which protect their character rather than their economic interests), including an "attribution right" and an "integrity right".[163] The "attribution right" is the right for the performer to "claim to be identified as the performer, except where omission is dictated by the manner of the use"; the "integrity right" is the right for the performer "to object to any distortion, mutilation or other modification of their performance that would be prejudicial to their honour or reputation, taking due account of the nature of audiovisual productions".[164] The UK has been a signatory to the Beijing Treaty since 2013, but was not able to ratify it independently while a member of the European Union.[165] In May 2022, in response to both ongoing work initiated following our inquiry on the *Economics of music streaming* and the Government's broader ambition to develop a new copyright strategy, the Government committed to implementing the Treaty using secondary legislation.[166] At the time of writing, this has not happened.

61. Beyond the impact of AI outputs on creators, it is yet to be settled whether an AI can be truly considered a creator in its own right. In March, the Supreme Court heard a case concerning two British patent applications for two inventions that the appellant stated were created by an AI machine known as DABUS in the absence of a traditional human inventor.[167] The case seeks to clarify the status of two patent applications for inventions by DABUS, including whether UK law provides the grant of a patent without a named human inventor and whether the owner, creator and user of an AI is entitled to the grant of a patent.[168] Above all, the nature of this case shows that AI will continue to have long-term impacts on intellectual property rights.

62. **The rapid growth of generative artificial intelligence and the impact this is already having on the ability of artists to protect their moral rights means that urgent action is necessary.** *The Government should improve protections for creatives to prevent misuse of their likeness and performances by emerging technologies such as generative AI. At minimum, this should involve bringing forward ratification of the Beijing Treaty on Audiovisual Performances by the time it responds to this report.*

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161   Equity (CRF0010)

162   The UKRI Trustworthy Autonomous Systems Hub (TAS Hub), The UKRI Trustworthy Autonomous Systems Node in Resilience, The UKRI Trustworthy Autonomous Systems Node on Security, The UKRI Trustworthy Autonomous Systems Node on Verifiability (TEC0048)

163   Intellectual Property Office, *Beijing Treaty on Audiovisual Performances: Call for views*, 23 April 2021

164   Ibid.

165   Ibid.

166   Intellectual Property Office, *Intellectual Property Office corporate priorities 2022 to 2023*, 12 May 2022

167   The Supreme Court, 'Thaler v Comptroller-General of Patents, Designs and Trademarks,' accessed 15 March 2023

168   Ibid.

Annex 1: Glossary of terms

Term	Definition	Synonyms and *examples*
Actuator	A component that controls or moves a device.	
Artificial intelligence	An autonomous system that generates outputs (e.g., content, predictions, recommendations and decisions) and improves performance based on data inputs to achieve goals set by its programmers.	AI Machine learning
Augmented reality	An interactive experience that combines or overlays computer-generated content over the real world.	AR
Cloud computing	Dispersed, remote computing services, such as data storage or processing, available over the internet and typically on-demand.	*Amazon Web Services (AWS)* *Google Cloud* *iCloud (Apple)* *Microsoft Azure*
Connected tech	An electronic device that can: operate remotely or autonomously; and connect to the internet, networks and/or other devices wirelessly.	*Connected device* *Smart device* *Internet-connected device* *Consumer connectable device* *Internet of Things device*
Connectivity protocols and standards	Rules that dictate how data is sent between and across devices, networks, servers, etc.	
Creative technology	Technology that enables the creative industries to produce new experiences, services, products and other forms of cultural activity.	CreaTech
Cyberattack	An intentional effort to compromise (steal, alter, disable, destroy, etc) data, applications or assets through unauthorised access to a digital device, computer system or network.	
Cyber hygiene	An evaluation of whether an individual or organisation takes regular, precautionary steps to mitigate against the risk and impact of cyberattack, like changing passwords, updating software and scanning for viruses.	
Cyber resilience	The ability for households and organisations to prepare for, respond to and recover from cyberattacks.	

Term	Definition	Synonyms and *examples*
Cybersecurity	The practice of protecting electronic information, digital devices, computer systems and networks from cyberattack.	
Data controller	A person or organisation that determines the purposes and means of the processing of personal data.	
Data processing	A range of activities, including collecting, recording, using, analysing, combining, disclosing or deleting data.	
Data protection	The process of protecting information from unauthorised access, theft, loss or corruption.	
Data subject	An identified or identifiable living individual to whom specific personal data relates.	
Digital twin	A simulation created from data gathered about a person, device or environment, which can then be used to run tests to learn how that subject might respond in hypothetical scenarios.	
Edge computing	Where data processing and analysis happens on data servers in close geographical proximity to devices in the network (in contrast to cloud computing).	
Firmware	Low-level programs that boot up and operate the device's hardware components.	
Gateway	A router or server that connects a multitude of other devices to the internet and aggregates, processes and analyses data and transmits commands to and from those devices at once.	
Generative AI	Artificial intelligence that generates images, text and other types of media in response to prompts.	*ChatGPT (and Bing Chat)* *DALL-E* *Midjourney*
Hardware	Physical components of a device.	*Actuators* *Microphones* *Processors* *Sensors*
Internet of Things (IoT)	Can be used either generally when referring to networks of connected devices, or more specifically to describe the point in time where there are more devices that are connected to the internet than people (estimated approx. 2015).	
Nearables	Devices that only work in close proximity to other devices.	

Term	Definition	Synonyms and *examples*
Operational Technology	Hardware and software that monitors, manages and controls an organisation's industrial operations. Often found in warehouses or outdoor areas like car parks.	OT
Personal data	Data that relates to an identified or identifiable individual.	
Processor	A component that responds to and executes instructions.	
Sensor	A component that detects events or changes in the device's surrounding environment.	
Shared virtual environment	Hypothetical iterations of the internet and/or computer systems that are represented as a single, immersive, holistic virtual world or platform where users can socialise, work, play, etc.	The metaverse *Horizon Worlds (Meta)* *ifland (SK Telecom)*
Smart city	An urban environment with networks of connected technology to collect data from citizens, other devices, buildings and assets. This is then used to manage assets, resources, public services, institutions and city planning and governance.	
Smart environment	Networks of devices in a specific physical location connected together to perform everyday tasks.	*Smart homes* *Smart cities* *Smart manufacturing* *Smart workplaces* *Smart schools*
Smart home	Connected devices within a building that can monitor and control attributes like lighting and climate.	Domotics Home automation
Smart meter	A device that records information such as energy and water usage in a home and enables two-way communication between a supplier and the device. Typically records data on consumption for billing purposes.	
Smart speaker	A loudspeaker that can connect to networks/devices and integrates a voice-activated virtual assistant.	*Amazon Echo, Amazon Echo Show* *Apple HomePod* *Google Nest, Google Home*
Software	Programs, instructions and data that run the device.	

Term	Definition	Synonyms and *examples*
Special category data	Types of personal data that are particularly sensitive. UK GDPR defines these as: data revealing racial or ethnic origin; political opinions; religious or philosophical beliefs; trade union membership; genetic data; biometric data (where used for identification purposes); concerning health; concerning a person's sex life; and concerning a person's sexual orientation.	
Telemetry	Data from measurements taken *in situ* to monitor specific things, ranging from meteorological data taken by weather balloons (to create forecasts) to performance data from a device or its operator.	
Virtual assistant	A computer program that performs tasks based on voice commands or questions. Included in smartphones, smart speakers, computers, etc. Typically activated by a "hot word" that signals to the assistant that the subsequent command should be sent to the cloud for processing.	*Alexa (Amazon)* *Cortana (Microsoft)* *Google Assistant (Google)* *Siri (Apple)*
Virtual reality	A simulated, digitally-rendered experience that immerses the user in a virtual world.	VR
Wearables	Body-borne devices, such as smartwatches, smart glasses and fitness trackers. Often used for health purposes and include sensors like heartrate monitors, accelerometers, altimeters, thermometers, GPS, etc.	*Apple Watch* *Apple Vision Pro* *Fitbit* *Google Glass* *Meta/Oculus Quest)*

Annex 2: Visit to the Republic of Korea

MONDAY 23 MAY	
11:00	Intro meeting and visit pre-brief with Deputy Head of Mission (Chargé d'Affaires) Meeting will discuss political context in Korea, particularly following the recent Presidential elections, as well as the UK's objectives in Korea and the role of the Embassy in working to achieve these objectives.
12:00	Working lunch at local restaurant with BE Seoul officials.
14:00	Meeting with MPs, government officials and creative industry representatives Meeting with three MPs of National Assembly Standing Committee for Culture, Sport and Tourism, two government officials from Ministry of Culture, Sports and Tourism (MCST), five creative industry representatives and an academic from Korea Development Institute, a government think tank.
16:00	Meeting with senior members of SM Entertainment and tour of company Meeting with senior members of SM Entertainment to learn 1) the scope of their business, 2) their international collaboration and audience engagement programmes and 3) their future plans related to use of digital technologies. This follows a 15-minute company tour.

TUESDAY 24 MAY	
09:00	Pre-brief with VisitBritain CEO Patricia Yates
09:35	Roundtable: Beyond London A roundtable discussion with experts from the South Korean outbound travel sector, alongside BE Seoul's Chargé d'Affaires, Nikesh Mehta, and Visit Britain CEO, Patricia Yates. Exam question: why do most South Korean visitors to the UK travel beyond London? What are the barriers that prevent them leaving London and how can we encourage them to explore the rest of the UK?
11:55	Traditional Temple Lunch with Korean Tourism Organisation and tour of temple Discussion on the operations of the Korean Tourism Organisation, and how the promote Korea as a destination for tourism.
13:00	Jogyesa Temple Tour
15:00	Working Holiday Event: Youth Mobility Scheme ROK Ministry of Foreign Affairs will lead this event highlighting the working holiday scheme between ROK and UK. Up to 50 young people who have been granted a visa to come to the UK for up to two years for the working holiday scheme will be in the audience. A former participant in the scheme will discuss their experience visiting Britain and then VisitBritain CEO will give 5 - 10 mins remarks welcoming them to the UK followed by questions.

| 16:00 | Meeting with SK Telecoms (SKT) and tour of SKT T.um exhibit

Meeting with SK Telecom to discuss 1) 5 & 6G, 2) broadband, 3) AI and digital infrastructure, and 4) up and coming tech and tech trends e.g., the metaverse. The meeting will be followed by a one-hour tour of their interactive tech-showcasing exhibit. |
|---|---|

WEDNESDAY 24 MAY	
07:00	Tour of DMZ Joint Security Area
13:30	Working lunch with HMA Colin Crooks
15:30	Roundtable discussion with four creatives

Roundtable discussion with four creatives to listen to their journey for global success, their insight of how K-style has won global attention and their views on how policy can support creative talents working internationally. This session will be facilitated by Fiona Bae, the author of an upcoming book, Make Break Remix: The Rise of K-style. |

THURSDAY 26 MAY	
08:00	BCCK Breakfast Event

British Chamber of Commerce Korea industry event on Korea's Entertainment Industry in 2022: Business Models, Success Stories and Future business Opportunities. |
| 09:35 | Intro meeting with the BCCK Executive Director Lucinda Walker |
| 11:00 | Meeting with National Assembly MPs [Digital Agenda]

Discussion with National Assembly MPs from the Ministry of Science and ICT Committee, and other MPs with an interest on online safety. Agenda will cover 1) the metaverse 2) online safety and 3) protecting human rights online. |
| 14:10 | Meeting with Samsung Electronics Vice President

Meeting with Samsung Electronics representatives to discuss 5&6G, ORAN, Semiconductors, Samsung's predictions/priorities for upcoming important tech trends, and Samsung's business interests in the UK. |
| 14:40 | Guided tour of Samsung Innovation Museum |
| 17:50 | Queen's Birthday Party |

FRIDAY 27 MAY	
10:00	Meeting with KENAZ Studio and studio tour

Meeting with Woojae Lee, CEO of KENAZ to learn 1) the scope of their business and 2) Korean webtoon business, followed by a 20 mins studio tour. |
| 11:00 | One-hour meeting with officials from Korea Creative Content Agency (KOCCA) |
| 12:30 | Meeting with the CEO of Ocon Studio and company tour

Meeting with Ilho Kim, CEO of Ocon Studio to learn 1) the scope of their business, 2) their international collaboration and audience engagement programmes and 3) their future plans related to use of VR/AR technologies. The meeting will be followed by a studio tour. |

15:30	Meeting with National Assembly Representatives with an interest in China Discussion topic: Korean foreign policy navigating the US/China rivalry. Korean Parliamentarians will give presentations, followed by a discussion/ Q&A session.
17:30	Wash-up meeting with HMA and DHM

Conclusions and recommendations

Artificial intelligence

1. We welcome the Government's sensible proposals for regulating AI, including taking a sectoral approach underpinned by six cross-sector principles. However, there are outstanding weaknesses with this approach that the Government should clarify, including ensuring that sector regulators who do not currently regulate in the tech sector will build up technical expertise and are working in a joined-up manner. (Paragraph 19)

2. *The Government should set out a plan to provide upskilling and resourcing for non-digital sector regulators to ensure they can meet the needs of the new cross-sector regulatory regime for AI.* (Paragraph 20)

3. The Government has announced that it intends to take on a central support role to buttress the regime for AI regulation and provide cross-sector cohesion. T*he Government should establish a discrete AI regulation co-ordination unit within Whitehall to ensure coherent working and enable robust stakeholder engagement. This unit should publish regular reports to enable Parliament to fully consider the progress of the regime's introduction and implementation.* (Paragraph 21)

4. We are pleased that the Government has been listening to stakeholders on text and data mining intellectual property for commercial benefit and we are encouraged that Ministers are looking again at this. The current framework, which provides an exemption for text and data mining for non-commercial research purposes and otherwise allows creators to licence their work for any further purpose, provides an appropriate balance between innovation and creator rights. (Paragraph 30)

5. *We recommend that the Government does not pursue plans for a broad text and data mining exemption to copyright. Instead, the Government should proactively support small AI developers in particular, who may find difficulties in acquiring licences, by reviewing how licensing schemes can be introduced for technical material and how mutually-beneficial arrangements can be struck with rights management organisations and creative industries trade bodies. The Government should support the continuance of a strong copyright regime in the UK and be clear that licences are required to use copyrighted content in AI. In line with our previous work, this Committee also believes that the Government should act to ensure that creators are well rewarded in the copyright regime.* (Paragraph 31)

6. *The Government must work to regain the trust of the creative industries following its abortive attempt to introduce a broad text and data mining exemption. The Government should consider how creatives can ensure transparency and, if necessary, recourse and redress if they suspect that AI developers are wrongfully using their works in AI development.* (Paragraph 32)

7. The Government's initial handing of the text and data mining exemption to copyright for AI development, though eventually correct, shows a clear lack of understanding of the needs of the UK's creative industries. All branches of Government need to better understand the impact of AI, and technology more broadly, on the creative

industries and be able to defend their interests consistently. We will continue to look on the Government's progress with interest. *The Government should provide a substantive update on its direction in managing the impact of AI on the creative industries and any discussions on these matters by the end of 2023.* (Paragraph 33)

Creative technology

8. While institutions are understandably investing in products such as the metaverse and generative AI, this should not be to the exclusion of novel and emerging technologies, which are enabling artists to innovate and attract audiences. *In order to encourage a rich and diverse cultural and creative technology ecosystem, the Government and its arm's-length bodies should ensure support for the creative industries encourages artists to push the boundaries of creativity and technology and is not limited to following the narrow interests of the tech sector. Cultural institutions should be encouraged and supported by the Government to invest in, present and preserve the results of creative technology.* (Paragraph 49)

9. As we have repeatedly raised, the tech sector and creative industries are experiencing long-standing skills and personnel shortages that have capped the potential for growth. *The Government's forthcoming Cultural Education Plan should explicitly discuss how educators can combine digital skills provision with creative and cultural education to nurture the next generation of digital artists, visual effects professionals and innovators in creative technology to address long-running skills shortages in the sector.* (Paragraph 54)

10. The Government's Cultural Education Plan Expert Advisory Panel has only recently been appointed, almost a year after the appointment of its chair and well over six months after Government said it would appoint its members. We have serious misgivings about the Government's insistence that it will publish the Plan in 2023 as promised, which we believe will now either be rushed or late. Neither of these outcomes will serve the needs and interests of our creative industries. *The Government must urgently clarify the scope and timescale for the Cultural Education Plan, to ensure it will deliver on its aims for the creative industries.* (Paragraph 55)

11. The rapid growth of generative artificial intelligence and the impact this is already having on the ability of artists to protect their moral rights means that urgent action is necessary. *The Government should improve protections for creatives to prevent misuse of their likeness and performances by emerging technologies such as generative AI. At minimum, this should involve bringing forward ratification of the Beijing Treaty on Audiovisual Performances by the time it responds to this report.* (Paragraph 61)

Formal minutes

Tuesday 18 July 2023

Members present:

Dame Caroline Dinenage, in the Chair

Kevin Brennan

Clive Efford

Rt Hon Damian Green

Dr Rupa Huq

Simon Jupp

John Nicolson

Jane Stevenson

Giles Watling

Draft Report (*Connected tech: AI and creative technology*), proposed by the Chair, brought up and read.

Ordered, That the draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 61 read and agreed to.

Annexes read and agreed to.

Resolved, That the Report be the Eleventh Report of the Committee to the House.

Ordered, That the Chair make the Report to the House.

Ordered, That embargoed copies of the Report be made available, in accordance with the provisions of Standing Order No.134.

Adjournment

Adjourned till Tuesday 5 September at 9.30 am.

Witnesses

The following witnesses gave evidence. Transcripts can be viewed on the inquiry publications page of the Committee's website.

Tuesday 19 July 2022

Silkie Carlo, Director, Big Brother Watch; **Dr Lulu Shi**, Research fellow, Oxford Internet Institute; **Dr Leonie Tanczer**, Lecturer, International Security and Emerging Technologies, UCL; **Antony Walker**, Deputy Chief Executive, techUK   Q1–68

Tuesday 11 October 2022

Matt Lewis, Research Director, NCC Group; **Professor George Loukas**, Professor of Cybersecurity, University of Greenwich; **Simon Moore**, Director for Strategic Engagement, Palo Alto Networks   Q69–146

Tuesday 1 November 2022

Dr Matthew Cole, Postdoctoral Researcher, The Fairwork Project; **Dr Asieh Hosseini Tabaghdehi**, Senior Lecturer in Strategy and Business Economics, Brunel University London; **Dr Efpraxia Zamani**, Senior Lecturer in Information Systems, University of Sheffield   Q147–215

Tuesday 22 November 2022

Svana Gisla, Producer, ABBA Voyage; **Dr Yiyun Kang**, Associate Lecturer, Royal College of Art   Q216–278

Tuesday 17 January 2023

John Edwards, Information Commissioner, Information Commissioner's Office; **Stephen Almond**, Director of Technology and Innovation, Information Commissioner's Office   Q279–369

David Kleidermacher, Vice-President of Engineering for Android and Made-by-Google Security and Privacy, Google; **Leila Rouhi**, Amazon Alexa Vice-President of Trust and Privacy, Amazon   Q279–369

Tuesday 31 January 2023

Julia Lopez MP, Minister of State for Media, Data and Digital Infrastructure, Department for Digital, Culture, Media and Sport; **Erika Lewis**, Director, Cyber Security and Digital Identity, Department for Digital, Culture, Media and Sport; **Sam Cannicott**, Deputy Director and Head of the Office for AI, Department for Digital, Culture, Media and Sport   Q370–427

Witnesses (Sub-committee on Online Harms and Disinformation)

The following witnesses gave evidence. Transcripts can be viewed on the inquiry publications page of the Committee's website.

Tuesday 22 September 2020

Theo Bertram, Director, Government Relations and Public Policy EMEA, TikTok   Q1–141

Yuan Yang, Beijing Deputy Bureau Chief and Technology Correspondent, Financial Times, and **Rui Ma,** Creator and Co-Host, Tech Buzz China   Q142–175

Tuesday 13 October 2020

Dr Jiahong Chen, Research Fellow in IT Law, Horizon Digital Economy Research, University of Nottingham, **Carly Kind**, Director, Ada Lovelace Institute, and **Dr Jeni Tennison**, Vice-President, Open Data Institute   Q176–235

Tuesday 26 January 2021

Elizabeth Denham CBE, Information Commissioner; and **Paul Arnold**, Deputy Chief Executive and Chief Operating Officer, Information Commissioner's Office   Q236–354

Published written evidence

The following written evidence was received and can be viewed on the inquiry publications page of the Committee's website.

TEC numbers are generated by the evidence processing system and so may not be complete.

1   (ISC)² (TEC0066)

2   AMDEA (TEC0056)

3   Age Check Certification Services Limited (TEC0059)

4   Amazon (TEC0065)

5   Anonymised (TEC0002)

6   Antisemitism Policy Trust (TEC0010)

7   Basu, Dr Subhajit (TEC0037)

8   Big Brother Watch (TEC0052)

9   Buckingham, Dr Sarah (TEC0014)

10   Canhoto, Dr Ana; Professor Ashley Braganza; and Dr Asieh Tabaghdehi (TEC0018)

11   Carney, Mr Sean (TEC0036)

12   Connected Innovations (TEC0030)

13   Department for Culture, Media and Sport (TEC0054)

14   Dodson, John (TEC0038)

15   Dodson, John (TEC0022)

16   EM Radiation Research Trust (TEC0026)

17   Electrical Safety First (TEC0055)

18   Electrosensitivity UK (TEC0008)

19   Goaman, Dr Karen (TEC0042)

20   Good Things Foundation (TEC0061)

21   Horizon Digital Economy Institute, University of Nottingham (TEC0046)

22   Information Commissioners Office. (TEC0051)

23   Internet Matters (TEC0044)

24   Jamieson, Mrs Gillian (TEC0015)

25   Jarvis (TEC0031)

26   Kanungo, Dr Rama (TEC0057)

27   Kenton, Mrs Amanda (TEC0033)

28   Loukas, Professor George; Professor Mina Vasalou; and Dr Laura Benton (TEC0034

29   Marshall, Susan (TEC0019)

30   Milne, Claire (TEC0041)

31   NCC Group (TEC0024)

32   News UK (TEC0063)

33   Petterson, Christina (TEC0027)

34   Physicians' Health Initiative for Radiation and Environment (PHIRE) (TEC0035)

35   Raith, Mr Stuart (TEC0003)

36   Rephain - the National Research Centre on Privacy, Harm Reduction and Adversarial Influence Online (TEC0043)

37   Radiocentre (TEC0058)

38   Rebel, Tanja Katarina (TEC0023)

39   Refuge (TEC0012)

40   Rudnicka, Dr Anna; Dave Cook; and Professor Anna L Cox (TEC0050)

41   Save Us Now (TEC0032)

42   Sengul, Dr Cigdem (TEC0016)

43   Shi, Dr Lulu P.; Prof Ekaterina Hertog; and Prof Victoria Nash (TEC0039)

44   Smith, Darren (TEC0001)

45   Steward, Dr Alison (TEC0009)

46   Tanczer, Dr Leonie (TEC0021)

47   techUK (TEC0049)

48   The Centre for Care, University of Sheffield (TEC0017)

49   The Restart Project (TEC0053)

50   The UKRI Trustworthy Autonomous Systems Hub (TAS Hub); The UKRI Trustworthy Autonomous Systems Node in Resilience; The UKRI Trustworthy Autonomous Systems Node on Security; and The UKRI Trustworthy Autonomous Systems Node on Verifiability (TEC0048)

51   The University of Gloucestershire (TEC0020)

52   The University of Manchester (TEC0064)

53   Turner, Sarah; and Dr Jason Nurse (TEC0029)

54   UK Research and Innovation (UKRI) (TEC0062)

55   University of Exeter; and Coastline Housing (TEC0040)

56   Which? (TEC0045)

57   Wood, Mr John (Retired) (TEC0004)

58   Zamani, Dr Efpraxia (TEC0011)

List of Reports from the Committee during the current Parliament

All publications from the Committee are available on the publications page of the Committee's website.

Session 2022–23

Number	Title	Reference
1st	Amending the Online Safety Bill	HC 271
2nd	Promoting Britain abroad	HC 156
3rd	Reimagining where we live: cultural placemaking and the levelling up agenda	HC 155
4th	What next for the National Lottery?	HC 154
5th	Economics of music streaming: follow-up	HC 874
6th	Current issues in rugby union	HC 1018
7th	Sustainability of local journalism	HC 153
8th	Appointment of Richard Sharp as Chair of the BBC	HC 1147
9th	Football governance	HC 1288
10th	Connected tech: smart or sinister?	HC 157
1st Special	Major cultural and sporting events: Government Response to Committee's Ninth Report of Session 2021–22	HC 452
2nd Special	Influencer Culture: Lights, camera, inaction?: ASA System and CMA Responses to the Committee's Twelfth Report of Session 2021–22	HC 610
3rd Special	Influencer Culture: Lights, camera, inaction?: Government Response to the Committee's Twelfth Report of Session 2021–22	HC 687
4th Special	Rt Hon Nadine Dorries MP	HC 801
5th Special	Promoting Britain abroad	HC 1103
6th Special	Reimagining where we live: cultural placemaking and the levelling up agenda	HC 1104
7th Special	What next for the National Lottery?: Government and Gambling Commission Responses to the Committee's Fourth Report	HC 1208
8th Special	Economics of music streaming: follow-up: Government Response to the Committee's Fifth Report	HC 1245
9th Special	The sustainability of local journalism: Government Response to the Committee's Seventh Report	HC 1378
10th Special	Appointment of Richard Sharp as Chair of the BBC: Government Response to the Committee's Eighth Report	HC 1641

Session 2021–22

Number	Title	Reference
1st	The future of UK music festivals	HC 49
2nd	Economics of music streaming	HC 50
3rd	Concussion in sport	HC 46
4th	Sport in our communities	HC 45
5th	Pre-appointment hearing for Information Commissioner	HC 260
6th	Pre-appointment hearing for Chair of the Charity Commission	HC 261
7th	Racism in cricket	HC 1001
8th	The Draft Online Safety Bill and the legal but harmful debate	HC 1039
9th	Major cultural and sporting events	HC 259
10th	Another pre-appointment hearing for Chair of the Charity Commission	HC 1200
11th	Pre-appointment hearing for Chair of Ofcom	HC 48
12th	Influencer culture: Lights, camera, inaction?	HC 258
1st Special Report	The future of public service broadcasting: Government Response to Committee's Sixth Report of Session 2019–21	HC 273
2nd Special Report	Economics of music streaming: Government and Competition and Markets Authority Responses to Committee's Second Report	HC 719
3rd Special Report	Sport in our communities: Government Response to Committee's Fourth Report	HC 761
4th Special Report	The future of public service broadcasting: Ofcom Response to Committee's Sixth Report of Session 2019–21	HC 832
5th Special	The Draft Online Safety Bill and the legal but harmful debate: Government Response to the Committee's Eighth	HC 1039

Session 2019–21

Number	Title	Reference
1st	The Covid-19 crisis and charities	HC 281
2nd	Misinformation in the COVID-19 Infodemic	HC 234
3rd	Impact of COVID-19 on DCMS sectors: First Report	HC 291
4th	Broadband and the road to 5G	HC 153
5th	Pre-appointment hearing for Chair of the BBC	HC 1119
6th	The future of public service broadcasting	HC 156
1st Special Report	BBC Annual Report and Accounts 2018–19: TV licences for over 75s Government and the BBC's Responses to the Committee's Sixteenth Report of Session 2017–19	HC 98

Number	Title	Reference
2nd Special Report	The Covid-19 crisis and charities: Government Response to the Committee's First Report of Session 2019–21	HC 438
3rd Special Report	Impact of Covid-19 on DCMS sectors: First Report: Government Response to Committee's Third Report of Session 2019–21	HC 885
4th Special Report	Misinformation in the COVID-19 Infodemic: Government Response to the Committee's Second Report	HC 894