CoSTAR
THE UK R&D NETWORK FOR CREATIVE TECHNOLOGY

UKRI Arts and Humanities Research Council

ForesightLAB

Driving UK-wide competitiveness in creative technologies

Evidence submitted to the House of Lords Communication and Digital Committee inquiry on Scaling Up in AI and Creative Technology

A Foresight Lab policy briefing

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The CoSTAR Foresight Lab

Driven by the UK's leading Creative Industries experts, the CoSTAR Foresight Lab is researching the adoption, use and impact of new, emergent and convergent technologies in gaming, TV, film, performance and digital entertainment.

Our findings will inform research, development and innovation across the Creative Industries, including the R&D taking place through the convergent screen technologies and performance in real time (CoSTAR) programme, the UK R&D network for creative technology.

CoSTAR is a £75.6 million national R&D network of laboratories that are developing new technology to maintain the UK's world-leading position in gaming, TV, film, performance, and digital entertainment. Delivered by the UKRI Arts and Humanities Research Council, the programme is supporting new innovations and experiences that will enrich the UK's creative industries, economy, and culture. The network comprises the National Lab, the Realtime Lab, the Live Lab, the Screen Lab and the Foresight Lab. CoSTAR is funded through UK Research and Innovation's Infrastructure Fund, which supports the facilities, equipment and resources that are essential for researchers, businesses, and innovators to do groundbreaking work. You can find out more by visiting www.costarnetwork.co.uk.

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Executive summary

This inquiry response provides evidence to support UK-wide competitiveness in creative technologies, with an open invitation to pilot new applications and ideas related to AI and creative technology via the CoSTAR Foresight Lab's ongoing work on the adoption and use of AI and advanced digital technologies across the creative industries.

Based on collated evidence and work undertaken in the lab's set-up phase (2023-24), this response poses three central recommendations:

1. **Further incentivise creative technology innovation across the UK by developing targeted interventions that respond to government mission areas.**
   Prioritise further investment in targeted interventions in and for the creative industries that relate to technology innovation and R&D. Such interventions can readily speak to the 5 mission areas set out by the Government.

2. **Develop policy and strategy that accounts for the convergence of technologies, using the creative industries as a case study for other sectors.**
   Within the creative industries, convergence, especially in digital workflows, reflects a high-impact opportunity. Strategy and policy can be designed around solutions, rather than siloed technology pillars.

3. **Make the creative industries central to the UK's ambitions to be a global leader in responsible AI, prioritising international export and global collaboration opportunities.**
   The UK's global leadership in the creative industries should be leveraged to drive global partnerships and private investment in technology and AI.

Submission introduction

1. The Creative Industries generate £126bn in GVA and the sector has been recognised as a key growth-driving sector in the UK[1]. The combination of the creative industries and digital technologies, and the UK's world-leading strengths in these areas respectively, provide an underexploited opportunity to drive national growth.

2. When creative skills and emerging technologies combine, the result is significant growth and investment. The UK already leads in some of the most notable areas at this intersection, including responsible AI innovation, video games, live performance, XR technologies, virtual environments and digital content. The Data City suggests that the annual turnover of the 'Digital Creative Industries' sector, defined as "using new technologies and digital practices in creative markets such as advertising, film, design and music," is £33.2bn with average company growth at 8.4% annually[2].

3. The broader impact of AI use and its increasing adoption across the sector, however, is yet to be comprehensively understood and evidenced. This was acknowledged within a previous 'At risk: our creative future' inquiry (2023) which specifically acknowledged the scale of disruption posed by new technologies to the sector and rapidly increasing international competition[3].

4. Whilst rapid advancements in technology inherently pose novel challenges and disruptions to existing workflows, the creative industries sector is at the forefront of responsible and innovative use cases. AI is already heavily adopted across workflows across the sector; as one example, a recent Unity survey found that 62% of video games studios are already using AI in workflows for rapid prototyping, asset creation and worldbuilding[4].

5. Driven by the UK's leading creative industries experts, the CoSTAR Foresight Lab is leading a programme of research to assess the adoption, use and impact of new, emergent and convergent technologies across the creative industries, including gaming, TV, film, performance and digital entertainment. Our findings will inform research, development and innovation across the sector.

6. The Foresight Lab is a partnership comprising experts across Goldsmiths University of London, Loughborough University, Edinburgh University and the BFI, alongside partners from ARUP, Data Thistle, Julie's Bicycle, the Creative Industries Policy and Evidence Centre (PEC), i2 Media Research, Olsberg SPI and Station 12. The Foresight Lab board includes representatives from world-leading industry players such as Industrial Light & Magic, Factory International and Microsoft.

1 https://assets.publishing.service.gov.uk/media/670cde8692bb81fcdbe7b745/industrial-strategy-green-paper-final.pdf
2 https://thedatacity.com/rtics/digital-creative-industries-rtic0064/
3 https://publications.parliament.uk/pa/ld5803/ldselect/ldcomm/125/125.pdf
4 https://unity.com/resources/gaming-report

7. The broader CoSTAR programme is a £75.6 million national R&D network of laboratories that are developing new technology to maintain the UK's world-leading position in gaming, TV, film, performance, and digital entertainment sectors. Delivered by the UKRI Arts and Humanities Research Council, the programme is supporting new innovations and experiences that will enrich the UK's creative industries, economy, and culture. The network comprises the National Lab, the Realtime Lab, the Live Lab, the Screen Lab and the Foresight Lab. CoSTAR is funded through UK Research and Innovation's Infrastructure Fund, which supports the facilities, equipment and resources that are essential for researchers, businesses, and innovators to do groundbreaking work.

8. This inquiry submission from the CoSTAR Foresight Lab centres upon **opportunities for the UK to grow its global competitiveness in the application and adoption of creative technologies – enabling the growth potential of SMEs in AI and creative technology across all parts of the UK**. It builds on the work that will be undertaken by the lab over the course of the next 5 years and complements additional inquiry submissions being delivered by other labs across the CoSTAR network.

9. It will speak most readily to the following questions posed in the inquiry:

- *Q3(a): What outcomes are being achieved and how effectively are existing organisations (such as UKRI), catalyst programmes, industry schemes and other Government initiatives addressing these issues?*
- *Q4. What further measures are needed to address barriers to scale in AI and creative technology?*
- *Q6. What can the UK learn from overseas?*

The response is split into three subsections centred upon the central recommendations posed in the executive summary, providing relevant evidence and insight.

Recommendation 1: Further incentivise creative technology innovation across the UK by developing targeted interventions that respond to government mission areas

Growth

10. The UK has the potential to be a world leader in creative technology innovation. The government has identified the creative industries as a central growth-driving sector and that innovation will remain a priority to achieve its central growth mission within the new Industrial Strategy Green Paper[5]. This is in addition to the announced establishment of the new Regulatory Innovation Office which will focus on boosting the adoption of new technologies across a range of sectors[6]. Whilst the adoption of new technologies is recognised as critical to certain sectors like healthcare and energy, as well as within government itself, there remains a lack of awareness of the central role the creative industries play in technology innovation - not only of the development of content and experiences using technology, but of new products and services. The sector is still seen as a lower priority for investment than traditional sectors[7].

5 https://assets.publishing.service.gov.uk/media/670cde8692bb81fcdbe7b745/industrial-strategy-green-paper-final.pdf

6 https://www.reuters.com/world/uk/britain-sets-up-regulatory-innovation-office-boost-growth-2024-10-07/

7 https://assets.publishing.service.gov.uk/media/652fc7ac92895c0010dcb980/Harnessing_Research_and_Development_in_the_UK_Creative_Industries.pdf

11. The sector is primed to innovate; a DCMS-sponsored survey revealed that 55% of creative businesses were undertaking R&D activity (2020)[8]. The success of existing targeted and place-based R&D interventions is testament to the potential of the creative industries in driving new technology-driven products. For example, the Creative Industries Clusters programme, funded by the Arts and Humanities Research Council led to 179 new products, services and tools developed each year of the programme, with a total of 383 minimum viable products being brought to market with programme support (including examples like text-to-speech plug-ins for games, and new immersive experiences); this in addition to training 691 businesses and broadly improving the understanding of the benefits of applied research in the creative industries for businesses less accustomed to R&D. The programme also led to R&D co-investment of £276.8m[9].

12. Whilst such programmes illustrate the benefits of targeted R&D and innovation interventions to support scaling technology businesses in the creative industries, the sector still only accounts for a total of 1% of UK Research and Innovation funding, despite making up 6% of the UK's overall economy[10]. This lack of investment will impact the ability for companies working in AI and creative technology to scale

13. As such, the government should prioritise further investment in targeted interventions in and for the creative industries that relate to technology innovation and R&D. Such interventions can readily speak to the 5 mission areas set out by the Government:

Breaking down barriers to opportunity

14. As acknowledged in Creating Growth: Labour's Plan for the Arts, Culture and Creative Industries (2024), the creative industries sector is critical to fostering pride in place and contributing to community cohesion[11]. Creative technology innovation interventions across the UK foster the potential to break down barriers to opportunity that can be accessed by scaling businesses, and subsequently enrich the local communities around them.

15. Regional productivity performance is closely linked to R&D and innovation – stimulating growth and innovation particularly for SMEs[12]. A recent LPIP report notes that decentralising national funding and policy controls related to R&D can enhance local innovation and focus on community-specific challenges[13].

8 https://assets.publishing.service.gov.uk/media/5f6483a5e90e0759fdaaba44/4565_-_DCMS_RD_in_Creative_Industries_Survey_-_Report_-_D8_PDF.pdf

9 https://www.ukri.org/wp-content/uploads/2024/07/AHRC-01072024-FRONTIER-BOP-CICP-CRDP-final-evaluation-report-STC2-20240524.pdf

10 https://craic.lboro.ac.uk/essays/how-much-does-the-uk-invest-in-publicly-supported-rd-in-the-creative-industries-and-how-does-this-compare-to-other-sectors/

11 https://labour.org.uk/wp-content/uploads/2024/03/Labours-Arts-Culture-Creative-Industries-Sector-Plan.pdf

12 https://orca.cardiff.ac.uk/id/eprint/157919/1/A%20place%20based%20system%20Regional%20policy%20levers%20and%20the%20UK%20s%20productivity%20challenge.pdf

13 https://pure-oai.bham.ac.uk/ws/portalfiles/portal/239379524/LPIP_Hub_Innovation_Evidence_Review_-_October_2024.pdf

16. As a national creative technology R&D network, CoSTAR marks a significant investment that will provide infrastructure specifically developed for the sector; developing four bespoke physical labs that will enable access to virtual production and realtime capabilities, the network will drive new-found collaborations and foster local networks between industry and academia.

17. As part of the CoSTAR Foresight Lab's work, we are conducting a series of regional engagements to better understand local challenges related to creative technology. Liverpool City Region, as one example, is currently in the process of establishing a local Creative and Digital Cluster; despite there being over 6500 companies working in creative tech in the region, the central challenge is scale-up opportunity for these businesses. This is compounded by a lack of investment and infrastructure locally.

18. Further investment to enable creative technology innovation and scale-up opportunity for businesses around the UK, that respond to local challenges (whether that be skills, infrastructure, etc.), will lead to more (and evenly distributed) high-growth companies, enabling the finance, talent and support ecosystem to grow the UK economy in the long term. Place-based interventions are more proximal and impactful to local communities and enable spillover into other areas, including new innovations for public services, healthcare and education.

Clean Energy Superpower

19. Publicly funded interventions can also be designed with this spillover in mind – for example, to encourage new AI and creative technology solutions that support the government's clean energy superpower mission. Whilst AI compute and enabling infrastructure are critical to enabling further technological innovation, this should be balanced with active clauses that seek to respond to consequent environmental impact.

20. Ensuring that UK creative businesses are supported through strong climate policy and green infrastructure has the potential to strengthen the UK's position in the global market, especially with the rise of legislation such as the EU's Corporate Sustainability and Responsibility Directive which will lead EU companies to look for lower-carbon suppliers which are able to support reporting and disclosure[14].

21. The delivery of the clean energy mission in the UK, alongside a focus on regional grid capacity, requires planning that will permit on-shored data centre connection to clean electricity – driving digital growth for the UK's creative industries and ensuring that the sector is able to access net zero aligned infrastructure on an equal footing to other sectors like energy and manufacturing. This applies particularly to creative SMEs which will likely be more dependent on software-as-service providers and face more constrained choices about self-hosting AI tools and other digital platforms.

14 https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en

22. Scaling AI and creative businesses need opportunities and support to adopt sustainable practice and measure carbon impact – and any new interventions should be designed with this at the centre. The Netherlands Film Fund, building out of the Government's Film Production Incentive[15], introduces sustainability as a critical component in the project development phase and encourages the use of carbon-calculation tools[16]. Austria, too, has established a legal basis for the implementation of ecologically sustainable production via their film production incentive[17].

23. We do not know what the likely carbon impact of AI compute infrastructure will be. The creative industries are likely to play a central role in determining how to measure this impact; recent commitments from the sector include the Climate Charter developed by the Creative Industries Council[18] and sector-specific PhD opportunities aligned to digital decarbonisation[19]. Alongside existing efforts, the CoSTAR Foresight Lab, in collaboration with ARUP and Julie's Bicycle, is undertaking a programme of work to assess the carbon and sustainability impacts of advanced digital technologies and their use in the creative industries. An initial report will be published in December 2024 that will use foresight techniques to assess key trends and examine carbon impacts using future scenario mapping. The report will form the basis for ongoing collaboration with creative technology stakeholders to determine the best approaches for measuring the carbon impact of AI and technologies across the sector and establish best practice for businesses operating in this space.

Recommendation 2: Develop policy and strategy that accounts for the convergence of technologies, using the creative industries as a case study for other sectors

24. Current policy approaches to technology and its use across sectors often consider individual technologies in a structurally pillared approach; that is to say, the UK often establishes technologies of focus individually – for example in the previous government's establishment of 5 critical technologies (AI; engineering biology; future telecoms; semiconductors; quantum)[20]. This is subsequently reflected in innovation funding opportunities which tend to be separated by technology types.

25. Whilst this approach is successful in determining which technologies are central to growth ambitions, it does not accurately reflect products and services that are developed that uniquely combine and integrate different technologies - also referred to as technological convergence – and the unique growth potential enabled by such convergence. For example, new immersive interfaces will uniquely combine AI-rendered worlds with immersive technologies like virtual reality, haptics and robotic capabilities. And AI is being used to enhance motion capture technology to create more realistic animations in film and video games. It is at this level of convergence that technologies are likely to have the biggest impact on businesses and most drastically disrupt existing workflows.

15 https://business.gov.nl/subsidy/film-production/

16 https://cineuropa.org/en/newsdetail/455411/

17 https://www.thecreativeindustries.co.uk/site-content/creative-climate-charter

18 https://filminstitut.at/en/aid/green-filming

19 https://www.lboro.ac.uk/schools/business-school/digital-decarbonisation/design-group/

20 https://assets.publishing.service.gov.uk/media/65c9f67714b83c000ea7169c/uk-science-technology-framework-update-on-progress.pdf

26. To that end, the CoSTAR Foresight Lab is conducting qualitative and quantitative research with relevant stakeholders, such as the BFI's Screen Sector Task Force, to assess what this convergence looks like in practice, asking respondents to outline which technologies they are already adopting and how this is shaping their workflows, talent needs, investment and infrastructure requirements. Technologies need to be regarded as a connected ecosystem of tools that provide the underpinning infrastructure for sectors to operate through and within; we will be collecting robust data to assess the impact of convergent technologies, and which technologies are being most readily adopted, across the sector.

27. Existing R&D and innovation activity in the creative industries is enabling new products and services that are driving new forms of technological convergence; this context is central to UKRI's investment in the national CoSTAR Network. Each of the five labs are centred upon specialist convergent application areas that combine a variety of technologies to drive innovation across different creative industries workflows. For example, the work being undertaken at the CoSTAR Live Lab (led by the University of York) will look specifically at the convergence of technologies in the live entertainment sector and ways of developing new live experiences, combining virtual production environments with advanced AI and compute power that will drive new live entertainment experiences[21]. ABBA Voyage is a popular example of what this kind of convergence looks like in practice, driving new live audience experiences that engage the public and drive significant economic growth[22].

28. As such, the lens of convergent creative technologies should form the basis of policy and strategy, as opposed to strategies that speak to individual technologies in silos. This would more readily speak to the ways creative businesses are using and innovating with a vast toolkit of different technologies, including AI, future networks, XR, IoT, blockchain and games engines. Within the creative industries, convergence, especially in digital workflows, reflects a high-impact opportunity, incentivising the development of new solutions that crowd around a problem space (e.g. skills, hardware, infrastructure) as opposed to an individual technology.

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Recommendation 3: Make the creative industries central to the UK's global positioning and partnerships related to AI and technology innovation

29. The UK's global leadership in the creative industries should be leveraged to drive global partnerships and private investment in technology and AI.
As frequently referenced, the creative industries sector to date has delivered more economic value than the life sciences, aerospace and automotive sectors combined[23], but is not a visible priority sector in existing AI policy and strategy in comparison to STEM sectors. The AI Opportunities Action Plan is a timely opportunity to explore the ways creative businesses can develop new and responsible products and services and support economic growth in regions across the UK[24].

21 https://www.ukri.org/councils/ahrc/remit-programmes-and-priorities/convergent-screen-technologies-and-performance-in-realtime-costar/costar-live-lab/

22 https://www.musicradar.com/features/abba-voyage-how-does-it-work-best-of-2022

23 https://assets.publishing.service.gov.uk/media/652fc7ac92895c0010dcb980/Harnessing_Research_and_Development_in_the_UK_Creative_Industries.pdf

24 https://www.gov.uk/government/news/ai-expert-to-lead-action-plan-to-ensure-uk-reaps-the-benefits-of-artificial-intelligence

30. Scaling businesses require certainty. This is increasingly important in the global context of use of creative IP in the development of generative AI models, and the uncertainty that this creates for businesses in the absence of a comprehensive national legal framework; this applies both to those wanting to build and use Generative AI tools, as well as creators producing the material on which these models are trained. Such uncertainty has compounded in strike action in the film and television industries across the globe.

31. It is critical that we get ahead and proactively balance technology adoption, IP protection and enabling talent in the UK to avoid future disruption for scaling businesses and the subsequent impact on economic growth. Whilst global efforts like the EU AI Act are being looked to by global governments, UK businesses require certainty and opportunity when it comes to technology innovation and regulation. This should be central to the ambitions of the Government's recently announced Regulatory Innovation Office[25], building upon and aligning previous horizon scanning work done by UK regulators as part of the Digital Regulation Cooperation Forum to assess the impact of emerging technologies[26].

32. Indeed, the UK has a unique opportunity to lead in this space given its strengths in creative industries and the digital sector respectively, as well as its global positioning and commitment to responsible AI to date.

33. Over the next 5 years, the CoSTAR Foresight Lab will be assessing global best practice in policy interventions that drive AI and creative technology innovation and opportunities for growth and scale-up – including key developments across upskilling and workforce activities, incentives, infrastructure and investment. Trend analysis undertaken to date has illustrated that there are new and emerging approaches to fostering further opportunities in AI and creative technology. In particular, there is an increase in global provisions for the inclusion of digital media and other content format in incentive systems. In Illinois, for example, a new tax credit for producers of interactive digital media projects is being explored – where applicants spend production and labour costs in-state, they can claim up to 30% of qualifying expenditure as a tax credit[27]. Similar options are being considered to explore state-focussed post-production provision and media production, including video games, in New Jersey and Massachusetts[28].

34. In addition, global M&A and investment activity is growing across the global media and live digital entertainment sectors, with a particular focus on digital content and technological innovation. For example, in Saudi Arabia, a government-backed entertainment initiative under the Public Investment Fund has provided debt and equity to live entertainment company HyperSpace, which has subsequently launched a $55m Series A funding round focussed on technology-powered physical

25 https://www.gov.uk/government/news/game-changing-tech-to-reach-the-public-faster-as-dedicated-new-unit-launched-to-curb-red-tape

26 https://www.drcf.org.uk/

27 https://www.njleg.state.nj.us/bill-search/2024/S3369 and https://malegislature.gov/Bills/193/H2773

28 https://www.ilga.gov/legislation/BillStatus.asp?DocNum=4847&GAID=17&DocTypeID=HB&SessionID=112&GA=103

entertainment experiences[29]. This is in the context of the continued growth of technologically driven live entertainment experiences; global companies like Netflix are developing permanent immersive entertainment venues across the US that will drive immersive live activities themed around popular streaming series[30].

35. As mentioned in Recommendation 1, environmentally sustainable practice is a growing priority in global creative technology markets, as technological practices like virtual production become more embedded in the media industry's efforts to improve pre- and post-production efficiency and explore the ways new technologies in the sector can enable carbon efficiency. The BAFTA Albert Sustainable Production Certification[31] marks the start of ongoing progress in this area in the UK, but this should be more actively written into policy. The New Zealand Film Commission, for example, has updated its sustainability criteria for qualifying applicants for its Screen Production Grant[32].

36. Aligning technology innovation with sustainability is equally important. The prominent EU AI Act mandates the publishing of information about the environmental impact of creating AI models. If brought into law in the UK, this would ensure larger UK-based AI companies are held to the same account as international counterparts, whilst also enabling UK-based creative SMEs to have access to the same level of information when making choices about which AI services and models to use. Such regulations also engender greater investor and consumer confidence and protection, whilst driving new innovation opportunities. Investments like the DESNZ AI for Decarbonisation programme are promising, but are yet to prominently feature any specific focus on the creative industries. The Foresight Lab is working closely with the Creative Industries Policy and Evidence Centre, the Creative Industries Council and Julie's Bicycle, to align on new opportunities for the sector to be at the front and centre of sustainable innovation activity.

37. Balancing ongoing pro-innovation regulatory approaches in the UK is critical, as well as harmonisation of UK policy with global legislation to drive investment and business certainty and confidence as international competition grows.

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29 https://www.arabnews.com/node/2434866/business-economy

30 https://www.netflix.com/tudum/articles/netflix-house

31 https://wearealbert.org/

32 https://www.nzfilm.co.nz/resources/nzspr-5-uplift-sustainability-action-plan-template

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