CATAPULT Digital

CREATIVE DEEP TECH

An emerging catalyst for the global economy

Foreword

Susan Bowen
Chief Executive Officer,
Digital Catapult

> Creative deep tech – a term coined by Digital Catapult – is fast becoming central to the UK's innovation future, transforming the creative industries and driving growth across the wider economy.

For over a decade, Digital Catapult has championed creative technologies, building the foundations for a national creative deep tech capability. Our work has supported the rise of pioneering companies such as Target3D, Camera Intelligence, MOONHUB, Loud Parade, Gravity Sketch and AudioStack. We've invested in and collaborated closely with many of these innovators as part of our commitment to strengthening the UK's creative deep tech ecosystem.

Our collaborative approach brings together partners across the UK creative landscape to tackle shared challenges and unlock new opportunities. This paper, the first in a series of three, sets the stage for creative deep tech: defining the concept, exploring its potential, and examining how the fusion of creativity and technology can power the UK's next wave of innovation-led growth.

We are at a pivotal moment. Advances in AI, spatial computing and immersive media are accelerating the convergence of creativity and technology faster than ever before, while global attention on the UK's creative industries continues to grow. Creative deep tech represents a strategic opportunity to harness that momentum for national prosperity, scaling our most exciting companies, and positioning the UK as the creative technology engine for the global economy.

We welcome the UK Government's renewed focus on the creative economy through the Creative Industries Sector Vision and Industrial Strategy. Scaling creative deep tech will require targeted investment in R&D, startup support, digital infrastructure and skills. It needs a coordinated vision, powered by collaboration across industry, academia and government, through UKRI, Innovate UK and beyond. We hope that this series of papers can contribute towards that goal and support the UK's ambitions and strengths in this area.

By investing, partnering and pushing the boundaries of UK leadership, we can ensure creative deep tech cements the UK's position as a global hub for innovation at the intersection of creativity, technology and enterprise.

Creative deep tech
The new frontier in creative technology innovation

The UK's creative industries represent one of the nation's fastest-growing sectors, projected to contribute £132.1 billion to the economy by the end of 2025.

At the intersection of this creative excellence and the UK's growing deep tech capabilities lies 'creative deep tech', a term coined by Digital Catapult to describe the powerful convergence of:

- creative industries
- creative technologies
- deep tech capabilities such as artificial intelligence (AI), extended reality (XR), advanced connectivity technologies, and digital twins

Digital Catapult has spent over a decade driving innovation at this intersection, establishing ourselves as a critical catalyst for creative deep tech development in the UK.

Through state-of-the-art facilities including Advanced Media Production studios and Immersive Labs, alongside programmes like CreativeXR, Augmentor, and MyWorld, Digital Catapult has:

- supported over 400 creative companies
- facilitated £263 million in early-stage investment since 2018

This work has nurtured globally impactful companies including:

- Camera Intelligence (formerly Alice Camera)
- Gravity Sketch
- MOONHUB
- Meaning Machine

These successes demonstrate the transformative potential of the creative industries' alignment with deep technology.

Digital Catapult

Our support in developing the UK's foundations for creative deep tech

There are a number of challenges facing UK creative deep tech market development that we have been addressing over the past 10+ years.

- **Limited investment in emerging media:** Through our work in CreativeXR (2017-2020), we have supported 60 immersive prototypes with £1.2 million in R&D funding, establishing the UK as a leader in XR content creation and demonstrating viable business models for immersive experiences.
- **Responsible technology development:** From publishing groundbreaking research on immersive ethics (2020) to developing the interactive artificial intelligence (AI) Avatar "KAI" (2024), we have proactively addressed concerns around AI, deepfakes, and digital identity, ensuring creators remain at the centre of technological innovation.
- **Sustainability challenges:** Through initiatives such as Terra Datum and the Textile & Fashion Supply Chain Testbed, we have pioneered research into energy-efficient virtual production and circular economy models, demonstrating how creative deep tech can reduce environmental impact.
- **Advanced network understanding:** Through projects, including the 5G Smart Tourism initiative, 5G Orchestra, and 5G Festival, we proved the transformative potential of advanced connectivity for creative applications for events, from distributed live performances to immersive tourism experiences.
- **Human-computer interface Evolution:** Through Surroundscapes (2019) and haptics research (2020), we explored emerging interaction paradigms, helping the industry understand and adopt spatial audio, haptic feedback, and immersive interfaces.
- **Creative AI development:** The recent BridgeAI programme partnership and the MyWorld AI accelerator with leading industry players support creative industries AI startups, addressing the critical gap in AI adoption within creative sectors while ensuring responsible development practices.
- **IP and ownership innovation:** Early blockchain experiments (2017-2018) with partners like Blokur and the UK Games Fund established foundational understanding of distributed ledger technologies (DLT) for creative rights management and new business models.

Our role in creative deep tech since 2018

400+

Creative companies supported

4

Local creative deep tech innovation clusters developed

10

Creative deep tech R&D facilities and labs developed and operated since 2018

129

Creative deep tech companies supported to raise investment

£263 million

Creative deep tech early stage investment raised since 2018

Creative deep tech
Unlocking the potential

To unlock the full potential of creative deep tech and maintain UK global leadership, we recommend a coordinated strategy across four key areas:

1. **Create Smarter National Programme**
   As referenced in the government's 2025 Creative Industries Sector Plan, establish a unified 'Create Smarter' initiative modelled on the Made Smarter programme, serving as the national front door for creative industries innovation. This should include regional creative industries engagement, a comprehensive directory of innovation assets, showcase events, and cross-government policy coordination to maximise creative deep tech's transformative potential across the economy and frontier industries and promote the UK's role overseas.

2. **Accelerate creative deep tech capabilities**
   Launch an AI & real-time creative computing centre of excellence, establish a UK creative deep tech innovation fund focused on multi-sector demonstrations, and invest in connected innovation infrastructure linking advanced media production facilities nationwide. Support should include inclusive entrepreneur programmes and creative AI data R&D facilities to ensure responsible, scalable development.

3. **Spatial internet strategy & investment**
   Position the UK as a global leader in spatial computing and the metaverse through a flagship UK spatial computing living lab & testbed, comprehensive national strategy, and cross-sectoral creative spatial R&D fund. This includes supporting distributed ledger technology infrastructure for improved IP and royalty automation, leveraging the UK's creative strengths in storytelling and design.

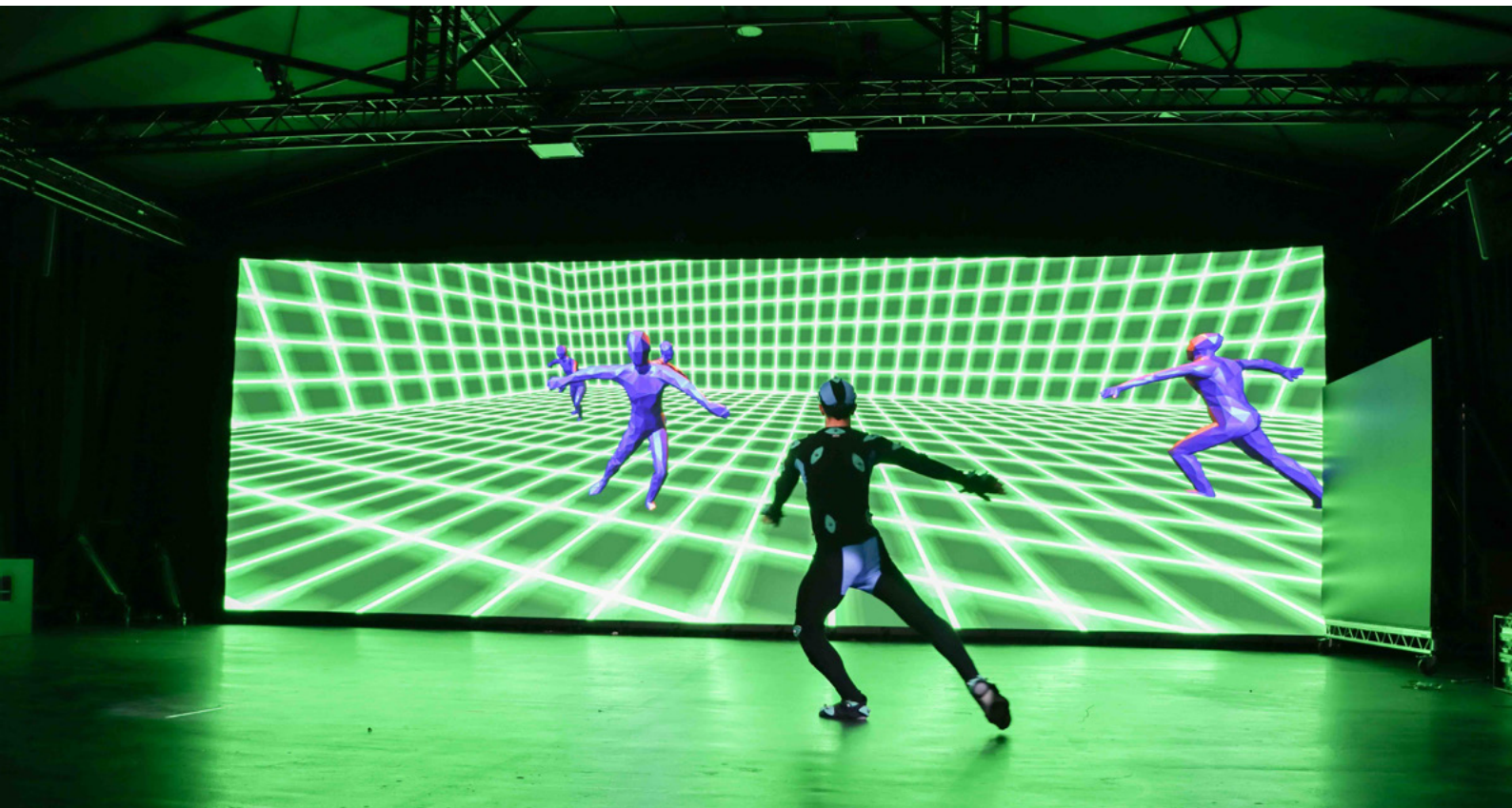
4. **Creative supply chain transformation**
   Establish a creative supply chain innovation Hub to improve resilience, economic security and sustainability across fashion, media production, and music. Support energy consumption analysis, sustainable production challenges, and creative supply chain digital twin pilots to reduce emissions, improve transparency, and enhance operational efficiency.

These recommendations, if implemented collectively, would help to cement the UK's position as the global epicenter for creative deep tech innovation, driving economic growth while ensuring technology serves creativity and puts creators at the heart of the digital future. They are explored in the third paper of this series *Our vision for the future of UK creative deep tech*.

What is creative deep tech?

> The creative industry is central to the UK's identity in innovation. It is the UK's fastest-growing sector, contributing £125 billion in GVA, at almost 6% of the UK economy (Creative UK). The creative industries are about much more than technology, digital, and technology transformations. They play a critical role in the creation, distribution, operation and consumption of content.

The influence of deep tech extends beyond media, entertainment, and gaming, and is driving tech breakthroughs with spillover effects across industries. Global tech giants like Meta, Apple, Nvidia, and Google are investing in areas pioneered by the UK's creative sector, including 3D design, gaming, and AI: while industrial players are using game engines through digital twins to power next-gen simulations, and are fast-becoming the future of digital and data infrastructure.



The rise of creative deep tech

Technologies such as extended reality (XR) exemplify the fusion of creative tools – gaming, 3D design, media production – with deep tech capabilities such as AI, digital twins and advanced networks. This convergence is driving the emergence of a cyber-physical internet and a new class of deep tech-enabled creative platforms. To stay competitive, the UK must build sovereign capabilities and shift from short-term innovation to sustained, R&D-intensive development.

When creative industries, technologies, and deep tech align, they generate global impact. Companies like DeepMind, alongside UK unicorns such as FiveAI, Synthesia and Improbable, all have roots in the UK's creative sectors, and show what is possible. To build on this success, the UK must cultivate new companies and scale existing ones to build new value chains. The UK is leading in creative deep tech, attracting investment, creating markets, and building a globally competitive ecosystem that leverages our identity and strengths in these areas – but more needs to be done to support it further. This includes ensuring the responsible use and development of technology, making sure it enhances and supports the creative industries, and puts creators at the centre of the innovations.

Digital Catapult's role in creative deep tech

Digital Catapult has spent over a decade driving innovation across the UK's creative and deep tech sectors in areas such as XR, AI, digital twins, blockchain, and advanced communications. Investing early into emerging and experimental areas such as volumetric capture and 5G enabled experiences in 2017/2018 and working with researchers through to high growth businesses, is vital to keeping the UK at the forefront of creative technologies. Our wide-reaching work with stakeholders from researchers through to high growth businesses is vital to keeping the UK at the forefront of creative technologies.

Creative deep tech
An emerging definition

What are the creative industries?

Creative industries have their "origin in individual creativity, skill and talent and which have a potential for wealth and job creation through the generation and exploitation of intellectual property." (UK Government's Department for Culture, Media and Sport) This includes sub sectors such as product and fashion design; film, TV, video and radio; museums and galleries; and music, performing arts.

What are creative technologies?

Creative technologies, or CreaTech, is where technology capabilities, products, and services have been born from use cases and opportunities developed within the creative industries. It brings together creative skills and emerging technologies to create new ways of engaging audiences and to inspire business growth and investment. It is often a set of technologies that artists, creatives, and designers use for creative expression such as modelling tools for virtual assets, games engine software for creating interactive environments, or virtual production pipelines for screen content.

What is deep tech?

Deep tech refers to technology-based innovations rooted in advanced scientific or engineering research, often requiring significant time and capital to develop, but with the potential to deliver transformative impact across industries and society.

What is creative deep tech?

Born from the creative industries, creative deep tech is an emerging market with significant opportunities for the UK economy. It forms its foundations from the connection of three key drivers of innovation:

Creative deep tech is often a convergence of creative technologies and innovative deep technologies together, such as the combination of games engines, advanced media-enabled production techniques, 3D design and immersive workflows with the transformative potential of AI, extended reality, advanced connectivity and sensors, distributed ledger technologies, and quantum computing.

The advanced capabilities emerging from the creative industries are fast becoming general purpose technologies, manifesting in transformational capabilities such as spatial computing, digital twins, and creative applications such as large language models.

Creative deep tech
A deeper breakdown

Creative deep tech sits at the intersection of deep technologies – those requiring significant R&D and offering transformative potential – and creative technologies, which are born from or used within creative industries. It goes beyond tools and workflows, representing a convergence of innovation that can reshape entire creative value chains and user experiences.

Key characteristics of creative deep tech

- Convergence of tech stacks, combining multiple deep tech domains (such as XR, blockchain, and digital identity) with creative workflows or outputs
- High R&D intensity, often involving long development cycles and academic/industrial research partnerships
- Transformative user experiences that enhance and redefine how stories are told, content is created, and users engage – within and outside the creative industries
- Cross-sector impact, with technologies often applied in sectors such as health, education, finance, defence, and manufacturing
- Novel IP, often protectable and commercially scalable, which is critical for global competitiveness

Example applications of creative deep tech

- The use of game engines in industrial contexts for 3D visualisations and interactive applications, including digital twins that visualise physical systems by integrating data with games engines for simulation and 3D design tools
- Remote maintenance and collaboration applications with mixed reality interfaces
- Virtual characters that use large language models (LLMs) to produce lifelike conversations for creative or educational contexts
- Creative asset governance leveraging distributed ledger technologies
- AI-assisted content generation for virtual environments and creative content through the use of various machine learning techniques, agentic AI, large language or other generative AI models
- Cloud-rendered immersive content for broader access to high-fidelity audio and visuals
- Connected advanced media production capabilities for distributed live performances
- New workflows and tooling for media production such as camera and 3D scanning technologies

Creative deep tech
From spark to scale

Over the past decade, creative deep tech has emerged as a transformative global capability – from AI models trained on creative media, the rise of spatial computing and mixed reality headsets, to the introduction of advanced media production techniques underpinned by advanced networks. But this early momentum faces real headwinds. In the UK, most activity is driven by startups and SMEs, and the market remains fragile with an overreliance on a subset of companies for the underpinning infrastructure.

Scaling innovation

Emerging creative deep tech startups lack access to the patient capital and infrastructure they need to grow from app builders into platform leaders. Funding is fragmented and fiercely competitive.

Skills gap and talent shortages

The emerging creative deep tech market suffers from a shortage of skilled professionals in areas such as extended reality, spatial computing, AI, and other emerging technologies. Cross-sector fluency is rare, and the talent pipeline is not keeping pace.

Diversity and inclusion deficit

The creative sector has long been dominated by a narrow demographic. Without broadening participation, there is a risk of stifling innovation and relevance.

Regional inequality and fragmentation

Support for creative tech is patchy and disconnected across the UK. Without a coordinated national approach, promising companies fall through the cracks.

Limited R&D access

Startups struggle to access the specialist facilities – advanced networks, media labs, compute power – essential for building next-gen creative technologies.

Slow tech adoption

Creative industries often lag in R&D investment and tech uptake, limiting their ability to spin out new products or break into adjacent sectors.

Rising global competition

While the UK delays, others move fast. Global players are scaling their ecosystems, attracting talent and investment that the UK risks losing.

Digital Catapult's work, including our Metaverse meets Web3 report, has exposed critical blockers for creative deep tech: a fragmented landscape, lack of concerted and long term support for R&D and innovation, and a lack of clarity in talent pipelines, terminology, and strategy. This work has been part of our mission to accelerate the practical application of deep tech and translate creative blue sky research into commercial reality.

To unlock the full potential of creative deep tech, we must overcome persistent and long-term challenges already outlined.

2015-2025: Challenges and opportunities in creative industries adoption of deep tech

In addition to the persistent challenges already outlined, over the last decade intervention has been required in a number of areas to support the foundational development, innovation, and adoption of deep technologies in the creative industries.

Limited investment into creative content and tooling for emerging media

Despite immersive technologies experiencing notable growth for UK creative industries and the emergence of new advanced media production techniques and tools, investment in creative content for extended reality has been modest compared to other creative industry subsectors.

Responsible development and application of creative deep tech

Rapid advancements in deep tech in the creative industries have led to increased concerns over their responsible development with challenges in data privacy, deep fakes, fair representation of creators, and misinformation.

Utilising deep tech to support creative industries sustainability

Sustainable production in the creative industries has become one of the defining themes over the years, including the green transition in content production, combatting fashion waste, and sustainability of value chains.

Lack of knowledge and understanding of advanced network benefits

Despite the creative industries being increasingly data reliant, requiring significant compute power, little regard has been given to the connectivity infrastructure required to support scaled applications, content and experiences.

Emerging new human computer interfaces for creative experiences

From screen to headset, touch to haptics – new ways of presenting, interacting with and embodying digital products and services have been prevalent over this time.

Exploring early use cases for AI's application in the creative industries

Since 2015, early use cases and exploration of AI in the creative industries have begun to lay the groundwork for AI's wider adoption, building the pathways to more substantive and complex applications.

Using DLT to manage creative IP and ownership

Experimentation in the application of distributed ledger technologies has led to exploration of new decentralised business models that can help creatives to manage ownership and intellectual property rights.

The future of UK creative deep tech

> Creative deep tech represents the next evolution of the UK's creative industries and CreaTech, where creativity and advanced technologies converge to generate new forms of value, innovation, and global competitiveness. To secure leadership in this area, the UK must continue to advance from the less sophisticated and scalable applications of CreaTech over the past 10 years, towards the deeper, more research-driven, and technology-enabled innovations that can create new opportunities and transform markets.

We will continue to build on the programmes, facilities, and foundations that we have built over the past 11 years. Our work to date is outlined in the second report of this series: *Developing the UK's creative deep tech market* which shows how the steps we take today can help to accelerate the creative deep tech of the future.

As the journey continues, we will build further partnerships with industry, work with government, support startups and scaleups, and collaborate with key innovation partners and UKRI to scale capabilities, strengthen the ecosystem, and ensure the UK remains at the forefront of a global deep tech revolution that will be powered by creativity.

Further exploration of what the future of creative deep tech innovation and R&D support could look like and the interventions that are need to get us there, can be found in the third paper of this series: *Our vision for the future of UK creative deep tech*.

CATAPULT Digital

For more information on how to get involved with creative deep tech and Digital Catapult's work, email **creativedeeptech@digicatapult.org.uk**

Or visit our website **www.digicatapult.org.uk**