

**Disclaimer:** This is a preliminary working draft, developed to serve as a basis for discussion. Feedback is sought from colleagues across faculties to help develop it further.

## ***Cultural and creative-tech ecosystems***

### **Context**

Cultural and creative industries are important for ensuring the continued development of societies and are at the heart of the creative economy, contributing over £119bn (6%) to UK GVA (2019). Knowledge-intensive and based on individual creativity and talent, they generate considerable economic wealth. More importantly, they are critical to a shared sense of identity, culture, and values. In February 2020, the Department for Culture, Media and Sport (DCMS) revealed that the sector is growing more than five times faster than the national economy<sup>1</sup>.

Sir Peter Bazalgette in his Independent Review of the Creative Industries stated that ‘the digital era, often referred to as the Fourth Industrial Revolution, represents an enormously exciting opportunity for a further wave of growth and innovation. We need to reimagine this as a ‘creative-tech’ sector’<sup>2</sup>.

The City of Bristol has a thriving cultural and creative sector, and is a world-renowned hub of immersive industries, creative technologies, and screen media<sup>3</sup>. It is home to an ecosystem of talented creative tech freelancers and SMEs, community-based arts organisations, cultural venues, and larger innovative businesses such as the award winning Aardmann Animations and the BBC Natural History Unit. Bristol is recognised as a globally significant high-growth creative cluster<sup>4</sup> with in excess of 4,000 business units making up 10% of the local business community.<sup>5</sup>

The area can point to cultural and creative assets which, for many, are a defining feature of an outstanding quality of life. This in turn has led to the development of a labour market that is characterised by its ‘thickness’ (in the sense of the wide range of skills within it) and ‘stickiness’ (with for instance high levels of graduate retention and a deep-rooted tangible commitment to ‘the place’).<sup>6</sup>

Universities play a central role in the cultural and creative industries:

- **Talent, skills, and entrepreneurship** - equipping people with the skills, knowledge, and expertise for working in the cultural and creative industries.
- **Research and innovation** – co-creating new products and services; stimulating new ideas that drive innovation; and providing a space for R&D
- **Clusters** – a hub for regional growth in the cultural and creative industries

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<sup>1</sup> [UK's Creative Industries contributes almost £13 million to the UK economy every hour - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/news/uk-creative-industries-contributes-almost-13-million-to-the-uk-economy-every-hour)

<sup>2</sup> <https://www.gov.uk/government/publications/independent-review-of-the-creative-industries>

<sup>3</sup> UNESCO City of Film [Bristol | Creative Cities Network \(unesco.org\)](https://www.unesco.org/en/creative-cities-network/bristol)

<sup>4</sup> Industrial Strategy Creative Industries Sector Deal <https://www.gov.uk/government/publications/creative-industries-sector-deal>

<sup>5</sup> NESTA Creative Nation [https://media.nesta.org.uk/documents/creative\\_nation-2018.pdf](https://media.nesta.org.uk/documents/creative_nation-2018.pdf)

<sup>6</sup> SQW Bristol-Bath Innovation Cluster <https://www.sqw.co.uk/insights-and-publications/bristol-bath-innovation-cluster/>

## **What does “Cultural and Creative-tech ecosystems” mean for the University of Bristol?**

Cultural and creative-tech ecosystems are complex, diverse and dynamic - they are at the heart of shaping 21<sup>st</sup> century society and economy. University of Bristol (UoB) is a key co-producer in the local ecosystem with global connections and reach. Creative-tech is a priority sector for the City of Bristol, West of England CA, and the Western Gateway.

Inclusive participation and cluster growth are underpinned by the increasing overlap between cultural, creative and digital sectors which are fusing into a creative-tech ecosystem.<sup>7</sup> This Creative Continuum is where UoB can add maximum value, applying the breadth of research expertise (across engineering, computer science, arts, humanities, psychology, business, and social science) through inter and cross-disciplinary collaborations to build new sustainable business, civic and technical models which society will need as it transitions into the digital age.

Through collaborative research we engage communities, creative, and immersive industries in co-designing technologies and technology solutions. Combining expertise across creative arts and technology we co-create solutions to important civic and commercial challenges. Our work also translates to impact in other sectors (Section 5).

We are shaping the delivery and co-production of new products and services and contributing to new digital creative, cultural and heritage content. Using innovative digital platforms and media to engage audiences in cultural and creative experiences.

Responsible, equitable and inclusive innovation is central to our collaborations and is embedded within our methodologies for co-designing with citizens, communities, and users. Generating mutual benefits rather than being extractive and transactional.

## **Existing track record and some of our most noteworthy achievements in this area to date**

The UK Government has recognised the significance of our region through major awards including the ISCF [Bristol+Bath Creative R&D](#) and UKRI SIPF [MyWorld](#). MyWorld is a beacon for the UK's creative sector and will position the region amongst the best in the world for screen-based media by building on regional strengths in creative media production, technology, and research. It will drive inward investment, increasing productivity, and delivering important employment and training opportunities.

UoB have partnered with cultural and creative industry partners, social enterprises, charities, and communities across the world (Appendices 1 & 2). We have a number of strategic partnerships with local and regional cultural and creative industries, including Bristol City Council Culture Team, Watershed, Aardmann Animations, BBC Studios and Knowle West Media Centre. Through [Brigstow](#), our researchers have collaborated with 131 creative industry partners since 2015.

UoB's distinct strengths can be identified across three cross-cutting areas:

### **Creative technologies**

UoB has a strong history of innovation in creative technologies. Collaborative industry programmes fused creative and technology expertise positioning the local cluster (Appendix 1) as early adopters of digital and mobile technologies. [Bristol Vision Institute](#) (BVI) has developed strategic relationships

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<sup>7</sup> DCMS Economic Estimates <https://www.gov.uk/government/collections/dcms-sectors-economic-estimates>

with global partners<sup>8</sup> and has attracted c. £70m of research funding since its formation in 2008. It has fused UoB expertise from science, engineering, and arts to work on fundamental challenges and applications. This has been recognised by an EPSRC Platform Grant and the MyWorld programme.

### **Content creation and consumption**

Our research contributes to the understanding of, and engagement with, cultural and creative industries, shaping content, production, and practices (Appendix 2). With expertise in [screen-based media](#), ranging from television drama, film comedy and the Western to colour in film, global cinemas, and animation. [Prof Street's research](#) has increased understanding of the preservation of colour films and expanded their presentation to today's audiences through collaboration with media partners. The [Virtual Reality Oracle](#) project brings together researchers from ancient history, neuroscience, psychology, and HCI to recreate a sensory immersive experience. Collaborating with cultural and creative partners to understand cognitive and sensory responses of users.

### **Inclusion in research and innovation**

Through relationships with global partners our research addresses inequalities in creative production and engages marginalised communities in collective storytelling via digital platforms. See Tucker (Politics) and Brown's (Modern Languages) [Quipu](#) project.

### **Three potential aspirational challenges for this theme**

UoB must play a visionary leadership role investing in research, skills, and spaces alongside cluster development to accelerate innovation and sustainable exploitation of the research for local and global benefit. Through co-created research in engineering, computer science, arts, humanities, psychology, business, and social science we will address the following challenges:

Co-designing new pervasive digital technologies to be exploited in industry, economies, and societies:

- User focused technology innovation: understanding the impact of acquisition, production and delivery on experience.
- How can we codesign future technology-based experiences?
- How do we live in new hybrid environments - immersive, augmented, automated, located - media and experiences?
- Addressing inequalities, ethics, diversity, bias, and security
- How will concepts of community and place develop?
- New networked business models
- The future of work – the role of creative jobs in an automated workforce

The future of narrative:

- How will we make and share meaning in a local global world with multiple cultural contexts and communities?
- Human mobilities and the role of nations and nationality. Time and temporalities and imagined futures in relation to human movement as a way of developing shared futures
- Who will make the narratives and how will they be communicated - what is literacy in the digital age?
- Understanding and developing diversity, skills and technologies: inclusion and exclusion
- How does technology shape narrative and narrative inspire technology?

Creativity in the digital age as a driver of production, delivery, and consumption - building value in the Creative Continuum (Appendix 3):

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<sup>8</sup> BBC, Netflix, YouTube, NTT, Tencent, Amazon, Aardman, BT

- Exploiting dependencies and interactions across production, delivery, and experience
- Seamless real and virtual spaces (time and space) - techniques and technologies for production and interaction. Working, living, and playing in the metaverse
- Efficiency vs energy, bandwidth and latency vs quality of experience.
- The role of AI as an assistant to the creative process.

Working seamlessly across these areas we will unlock previously unattainable opportunities for collaboration, funding and exploitation.

## Appendix 1

UoB led R&D initiatives have provided academic foundations and had a positive impact on regional cluster development. They led to the establishment of cluster development hubs such as Pervasive Media Studio (2008), Bristol Games Hub (2013) and the Centre for Innovation and Entrepreneurship (2016).

Our ground-breaking research collaborations in creative technologies includes:

<b>Research programme / project</b>	<b>UoB lead</b>	<b>Partners</b>	<b>Funded by</b>
Bristol Creative Technology Network	Prof David May	Bristol media industry	EPSRC (1998-2002)
Mobile Bristol	Prof David May	HP (lead) and The Appliance Studio	DTI (2002-2005)
<a href="#">REACT</a> & Rooms Festival	Prof Tim Cole (Arts)	UWE (lead) University of Bath, University of Exeter, Cardiff University and Watershed	AHRC (2012-2016)
<a href="#">PROVISION</a>	Prof David Bull (BVI, Engineering)	Netflix, YouTube, TUB, BBC, Aachen, Fraunhofer HHI Berlin), Univ Nantes.	EU H2020 MSC (2013-2016)
<a href="#">Vision For the Future</a>	Prof David Bull (BVI)	AMPAS, BBC, HHI, Purdue	EPSRC Platform Grant (2015-2020)
5GUK Test Networks & <a href="#">layered realities first public 5G demonstration</a>	Prof Dimitra Simeonidou (Smart Internet Lab)	Watershed, University of Surrey and Kings College London	DCMS (2017-2018)
<a href="#">Virtual Realities - Immersive Documentary Encounters</a>	Prof Ki Cater, Engineering	UWE and University of Bath	EPSRC (2017-2020)
<a href="#">Multiidrone Media Experiences</a>	Prof David Bull, Prof Andrew Calway (BVI, Engineering)	AUTH (Lead), RAI, DW, UPC	EU H2020 (2017-2020)
<a href="#">Bristol+Bath Creative R+D</a>	Prof Tim Cole (Arts) & Prof Dave Bull (Engineering/BVI)	UWE (lead), University of Bath, Bath Spa University and Watershed	UKRI ISCF (2018-2023)
<a href="#">Bristol Digital Futures Institute</a>	Prof Dimitra Simeonidou (Smart Internet Lab) & Prof Susan Halford (Social Science & Law) (Bull Co-I)	>20 industry partners	Research England (2019-2029)
<a href="#">5G Create: 5G-Edge XR</a>	Prof Andrew Calway, Prof David Bull (BVI, Engineering)	BT (lead), Condense Reality	Innovate UK (2020-2022)

<a href="#">Connecting through culture as we age: digital innovation for healthy ageing</a>	Dr Helen Manchester (Social Science & Law)	Creative & cultural partners and third sector & community partners	ESRC (2021-2024)
<a href="#">MyWorld</a>	Prof David Bull, Prof Andrew Calway, Prof Ki Cater (BVI, Engineering), Prof Mary Luckhurst (Arts), Prof Martin Parker (Social Sciences), Prof Iain Gilchrist (BVI, Psychology)	>30 regional and global partners inc Netflix, Google, NTT)	UKRI SIPF Programme (2021-2026)

## Appendix 2

Through co-production and collaborations our research shapes creative and cultural production and practices. These can be categorised into the following sub-themes. Note, there are crossovers across these sub-themes:

- Audience experience and engagement
- Curation, preservation, and commemoration
- Placemaking and spatial humanities
- Performance
- Visual and textual cultures
- Empowering communities
- Storytelling and narrative
- Translating cultures

Sub theme	Research strengths	Selected examples
Audience experience and engagement	<p>Understanding audiences and shaping policy.</p> <p>Creating engaging immersive experiences for audiences and embedding audiences within the process of production.</p>	<p>Eidinow (Classics): AHRC <a href="#">The Virtual Reality Oracle Project</a> creating sensory immersive experience</p> <p>Finglass (Classics): Major Leverhulme Fellowship <a href="#">Sappho and Alcaeus: a new critical edition</a></p> <p><a href="#">Sedgman</a> (Theatre): Shaping audience behaviour policies and social media practices</p>
Curation, preservation, and commemoration	<p>Expertise in interpreting artefacts, archives, and collections; and working with museum and heritage professionals to preserve and curate exhibitions.</p>	<p>Hodos (Anthropology): <a href="#">Globalising Luxuries</a> with The British Museum</p> <p>Hutton (History): <a href="#">Stonehenge Visitor Centre</a></p> <p>Mukherjee (History): Indian Suffragettes and <a href="#">The British Library Unfinished Business Exhibition</a></p> <p><a href="#">Street</a> (Film &amp; TV): AHRC and Leverhulme-funded research has increased understanding of the preservation of colour films and expanded their presentation to today's audiences</p> <p>The <a href="#">Theatre Collection</a></p>
Placemaking and spatial humanities	<p>Using digital technologies in participatory and place-based performance.</p> <p>Shaping policy through expertise in the history of heritage sites, understanding how communities engage and interact with physical and virtual places and heritage sites.</p> <p>Mapping communities through time.</p>	<p>Ailes (French): <a href="#">Tackling uncertainty across the centuries: medieval and moderns in conversation</a></p> <p>Bickers (History): <a href="#">Know Your Bristol</a>, empowering engagement with local history and heritage</p> <p><a href="#">Burch Brown</a> (Philosophy): Contested heritage and public memory of slavery and colonialism. Collaborating with Ben Stephenson, Place Maker, to develop practical policy responses to the debate surrounding controversial statues, monuments, and place names.</p>

	Contested heritage.	<p>Clarke (Theatre): <a href="#">Future Places Toolkit</a></p> <p>Fulton (English): <a href="#">Making Bristol Medieval</a></p>
Performance	Using historical research to inform, shape and co-create performances.	<p>Brockington (History of Art) worked with Impermanence Dance Theatre and the Paul Mellon Centre to create a <a href="#">film and exhibition centred on experimental theatre in London in the First World War.</a></p> <p>Cole (Classics): <a href="#">Punchdrunk on the Classics</a></p> <p><a href="#">Siviter</a> (French) working with professional actors to explore approaches to acting in eighteenth-century France and how these might inform contemporary practice.</p>
Visual and textual cultures	Research in visual and textual cultures expressed in such cultural artefacts as video games, graphic novels, manga, landscape design and artwork from video installation to graffiti.	<p><a href="#">Daniels</a> (Italian): Collaborating with artists <a href="#">CreativeShift</a> in using printing techniques to evaluate the impact of creative activity on mental health during lockdown.</p> <p>King (HiPLA) and Krishnan (English) in collaboration with <a href="#">Creative media company Grapevine worked with visual artists and writers to develop prototypes of creative works that connect print media to digital audio in new ways.</a></p>
Empowering communities	<p>Global inequalities in creative production and social inclusion.</p> <p>Using innovative digital platforms and media to engage marginalised communities in collective storytelling.</p>	<p>Brown (HiPLA) <a href="#">Quipu</a> and <a href="#">MEMPAZ</a> projects developed innovative digital platforms to capture collective memories and give voice to victims of social injustice.</p> <p><a href="#">Bush</a> (French) and <a href="#">Krishnan</a> (English) have transformed the African literary landscape; strengthened training and professional networks for literary translators enabling a sustainable literary infrastructure.</p> <p>Morelli (Anthropology) working with Aardmann Animations on British Academic Funded '<a href="#">Animating the Future: Exploring the Life-Trajectories of Indigenous Youth in Amazonia through Ethnographic Animation</a>'.</p>
Storytelling and narrative	Using storytelling to connect people with histories and literature, often through digital and creative technologies.	<p>Pooley (History): <a href="#">Creative Histories of Witchcraft</a></p> <p>Putter (English): <a href="#">North Sea Crossings</a> project uses storytelling to bring literary heritage back to life in a puppet animation co-produced with Aardman</p>



	Creative writing.	Animations, and a major exhibition in The Bodleian's Weston Library.
Translating cultures	Understanding and promoting multilingual cultures, values, and histories.	<p>Ellison (Music) ERC and AHRC <a href="#">Beyond East and West</a> project working with creative practitioners to model new ways of navigating between different cultures' musical traditions, transmission and learning styles.</p> <p><a href="#">Zhang</a> (Translation): Translating Video Games workshop with Creative Youth Network exploring how video games are adapted and localised for different cultures.</p>

### Appendix 3

