The Networked Shift

A Creative Industries Foresight Study

Rachel Coldicutt OBE, Anna Williams
and Dominique Barron

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Careful Industries

Commissioned by

**Creative Industries
Policy & Evidence Centre**
Led by **nesta**

MyWorld

This project was commissioned by the Creative Industries Policy and Evidence Centre and MyWorld to identify and anticipate changes in the next three to five years that will have a bearing on the development of the creative industries, both in the UK and internationally.

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Funded by the UKRI Strength in Places Fund, MyWorld is the flagship for the UK's creative sector and is part of a UK-wide exploration into devolved research and development funding. Led by the University of Bristol, the £30 million programme is made up of 13 partners from the West of England region's creative technologies sector and world-leading academic institutions to create a unique cross-sector consortium.

Launched in April 2021, MyWorld will run for 5 years and has a mission to catalyse the region's creative economy, creating new jobs, driving inward investment and supporting sustainable and inclusive business growth.

To achieve this, the programme will enable the research and development of new products, processes and services that advance regional capabilities in creative digital production, network distribution and audience evaluation research. With its unique set of creative partners and research collaborators, MyWorld will also deliver ground-breaking experimental productions, invest in innovative research and production facilities, create new skills programmes and develop the region's creative business ecosystem.

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The Networked Shift

A Creative Industries Foresight Study

Introduction

"The creative industries are a mycelial network"

Expert interview

This report gathers a number of trends unfolding in the creative industries. It describes ways in which creative and consumer behaviours are both changing and being changed by digital technologies and automation, surfaces some of the tensions emerging as a result of those changes, and identifies a broader shift in where, and how, innovation is occurring.

Throughout the project, we have observed that technological change is only one driver of innovation in the creative industries: creative production is also a social process, developed through relationships and networks. And unlike formal R&D, which might be systematic and aimed at knowledge creation (Hasan Bakhshi 2017), creativity does not always follow a set path. While Runco and Jaeger suggest that the *"standard definition of creativity"* encompasses *"originality and usefulness"* (Runco and Jaeger 2012), Gregory Sholette raises the issue of how little of the creative process is actually tangible or countable. Sholette terms this *"creative dark matter"*, and he describes it as comprising *"makeshift, amateur, informal, unofficial, autonomous, activist, non-institutional, self-organized practices"* (Sholette 2010).

As such, in considering the future of the creative industries, our field of enquiry has attempted to surface some of the dark matter at the intersection of creativity, technology, and innovation. This digital dark matter includes the ways creative people and practices adapt and shape technologies and the power of hype and narrative in shaping new trends.

The overall shift this report anticipates is a networked one.

Digital tools and processes are already enabling creative practitioners and audiences to reconfigure their outputs and interests in new ways, beyond traditional industry genres or verticals. It seems probable this shift will continue, resulting in the emergence of a more adaptive, networked constituency within the creative industries, operating beyond the constraints of many existing organisational and bureaucratic norms.

For creatives, informal and adaptive innovation plays a significant role in driving new methods of creation, production, and distribution. This is apparent at both ends of the financial and organisational spectrum, with major corporates and independent creatives both exploiting the distributive and creative potential of digital technologies.

This networked shift is also giving rise to what BBC creative technologist Henry Cooke described in an expert interview as *"nucleated audiences"* – groups that cluster around specific interests. The coexistence of many nucleated audiences – which, at scale, we have termed 'deep fandoms' – has resulted in the growth of a culture of subcultures, in which

belonging and identity are shaped by engagements with complex, often multi-platform storyworlds. Legibility across and between these subcultures and interests can be difficult to acquire, meaning that subcultures or fandoms can feel artificially remote from one another.

Using Bill Sharpe's Three Horizons model (Sharpe 2020), we have termed this networked shift a new third horizon, and we propose it may unfold at speed.

We have also located three tensions, or sticking points, that are emerging within the existing innovation environment. These are points at which established approaches come into conflict with unfolding social or technical innovations.

Sticking points	Factors affected
The Opportunity Contradiction: content creation and distribution has been democratised by digital tools yet the UK creative industries are not representative of the entire country.	commercial implications
	the changing shape of the workforce
	the propensity of the creative industries to innovate
The Impact of Automation on the Creative Industries: it seems probable that narratives about the potential impact of automation on the creative industries are (and will continue to be) heightened – but it is difficult to predict exactly how heightened.	the human process of technical adaptation
	the impact of hype and narrative
	the changing shape of the workforce
	new ethical dilemmas
	data and other infrastructures
Platform Dependency in a Post-Lockdown World: pandemic-era norms have yet to emerge; this makes data-driven decision-making difficult for many businesses, giving rise to new levels of uncertainty. This uncertainty is increased by the propensity of platform businesses to pivot quickly in response to changing conditions.	data
	business models
	supply-side focus
	the changing shape of the workforce

In conclusion, we propose that this new digitally networked opportunity can be catalysed by building networks of people and funding across the creative industries, organised beyond traditional industry or technology-focussed silos. This would enable a range of big challenges – from better quality data sets to workforce resilience – to be addressed cooperatively, collaboratively, and creatively, while also building resilience and technical and narrative confidence across the creative industries.

Methodology

This project was commissioned by the Creative Industries Policy and Evidence Centre and MyWorld to identify and anticipate changes in the next three to five years that will have a bearing on the development of the creative industries, both in the UK and internationally. The aim is to make clear potential future directions in the creative industries, exploring how what is currently known might evolve in the light of new technologies, significant industry shifts, and changes in consumer behaviours.

Careful Industries engaged in a rapid, immersive process between December 2022 and February 2023. The original intention was to conduct a series of collaborative, relational foresight workshops with experts from across the creative industries, but a number of constraints meant the project was reshaped while in progress, and took the following format:

- A series of workshops with expert participants and project partners to shape the field of enquiry. Through this process seven vignettes describing preoccupations and emergent themes were developed (see Section 1).

- A grey literature review, including trade and expert commentary alongside traditionally published sources to identify connections and trends between the seven emergent themes.

- The vignettes were used as stimulus for a second set of workshops and a process of consultation and co-creation with the project team. The second round of workshops focussed on future potential policy interventions, working backwards from identified possible and plausible futures. This process helped to identify a range of current conditions that might enable and inhibit innovation in the creative industries, leading to the identification of three cross-cutting, complex factors, or sticking points. Each sticking point is made up of a number of dynamic components: some of these components facilitate or are a product of social and technical innovation, other components inhibit change or actively maintain the status quo (see Section 2).

- In parallel with further desk research activities, we conducted qualitative interviews with fifteen industry experts who shared their perspectives and experiences relating to the future implications of the three sticking points.

- These inputs were then analysed with the aim of identifying potential and plausible future signals and shifts.

Figure 1: Diagram showing the field of enquiry for this project
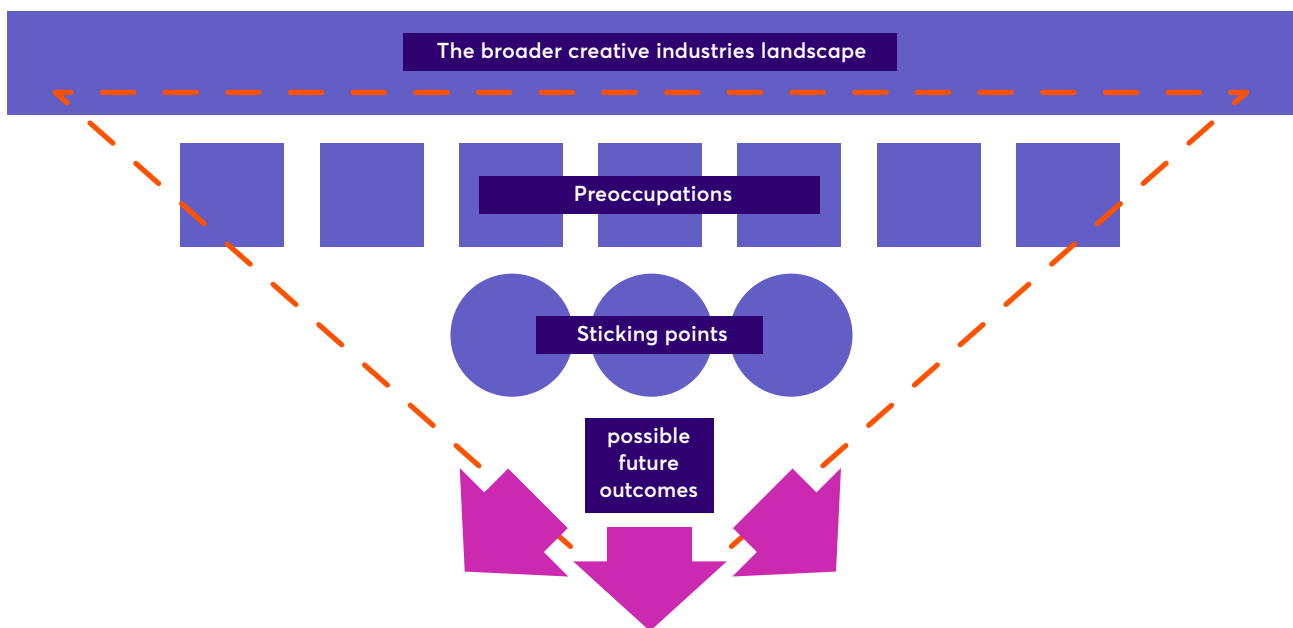
This report suggests some of these possible future outcomes, and begins by unpacking the themes and emergent factors that produced them.

The Three Horizons model

Throughout this report, we reference and build upon Bill Sharpe's Three Horizons Model. Sharpe describes the model as giving:

A deeper understanding of the significance of what we usually call short, medium and long term futures. The model is based on the observation that businesses, technologies, political policies and even whole civilizations exhibit life-cycles of initiation, growth, peak performance, decline and even death. These cycles can be viewed as waves of change in which a dominant form is eventually overtaken and displaced by another.

(Sharpe 2019)

Figure 2: Three Horizons Model, Bill Sharpe, H3Uni.org (2019)
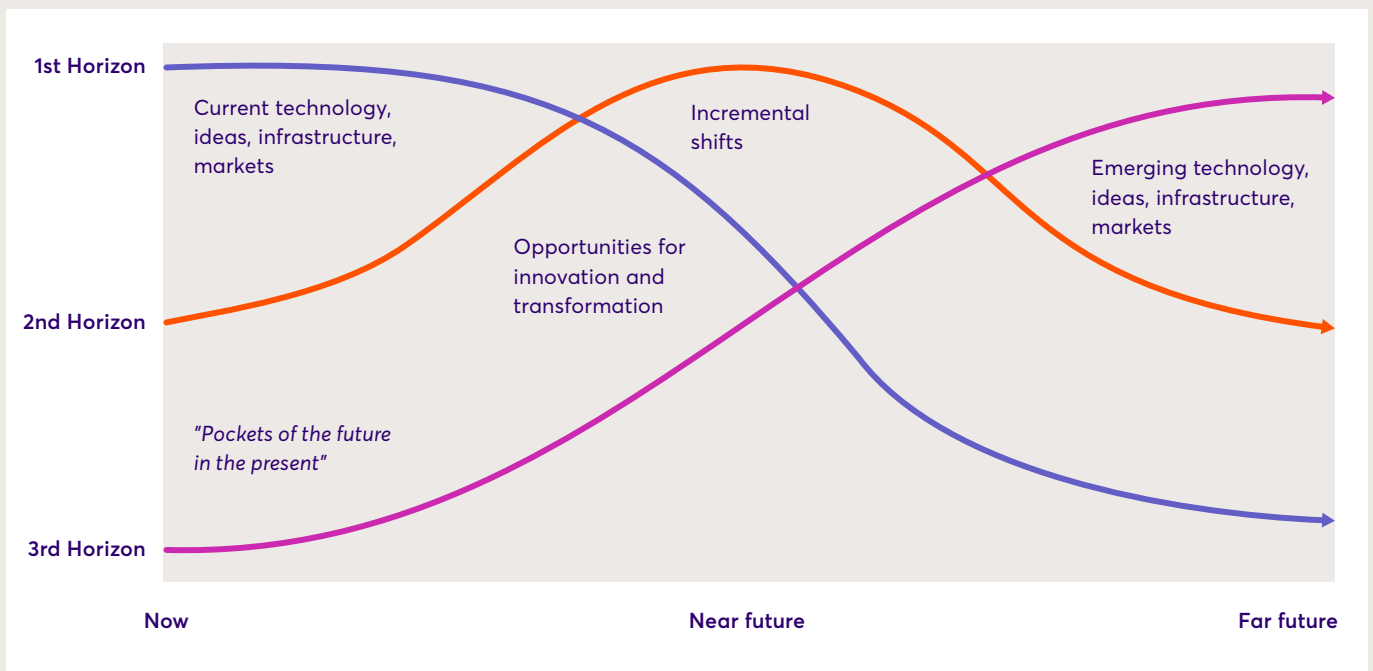
The purpose of the Three Horizons is not to necessarily indicate change over time, but to indicate the nature and scale of change, and to provide a mental model for understanding complexity.

Sharpe describes the horizons as such:

Horizon One is *"the dominant system at present. It represents 'business as usual'."*

Horizon Three *"emerges as the long term successor to business-as-usual. It grows from fringe activity in the present that introduces completely new ways of doing things but which turn out to be much better fitted to the world that is emerging than the dominant H1 systems."*

Horizon Two is *"a pattern of transition activities and innovations, people trying things out in response to the ways in which the landscape is changing."* (Ibid.)

In speculating on possible future outcomes, this report seeks to understand both states of change and their potential impacts. We have used the Three Horizons model as a framework for describing and conceptualising complex change as a continuous process. More resources are available at www.h3uni.org.

Some interviewees requested to be quoted anonymously.

1

Emergent themes

1.1 Implosion mapping

Careful Industries conducted two rounds of Implosion Mapping with the commissioning teams.

The implosion mapping format[1] we have developed is based on the approach outlined in Joseph Dumit's *Writing the Implosion: Teaching the World One Thing at a Time*. Drawing on the writings of Donna Haraway and Giles Deleuze, Implosion Mapping is a method of *"waking up to connections"* (Dumit 2014) and externalising existing, often unspoken, knowledge. The process begins by breaking down relevant material objects into their physical and symbolic components, mapping connections and trends, and then exposing areas of established knowledge, points of uncertainty, and future areas of enquiry.

Understanding objects as points of connection that combine *"technical, textual, organic, historical, formal, mythic, economic, and political dimensions of entities, actions, and worlds"* (Haraway 1988) is a useful way of rapidly surfacing tacit knowledge. Workshop participants mapped their observations and connections onto a simplified version of the Johari Window, indicating where trends and insights were well-established, emergent, and hidden from view.

Figure 3: One of the knowledge maps created through the implosion process

Known knowns

inbuilt elitism

how people use existing and old innovations in the creative work they do

similarity of this to the hardware

hidden labour involved in processes - moderators, makers, administrators, creating automation

democratising distribution

disappearance of wires as promise of freedom of movement and pervasiveness but leads to labour all the time

"at some point we won't even need screens anymore" hides the labour, precious resources, adaptability of humans

I have the means of production and distribution!

linearity and non-linearity of innovation

Reminder

totemic nature of physical objects

Significant during war times

Social, environmental & economic costs of technical requirements

Known unknowns

what does consent mean in this context?

what are the physical outcomes of that

ethics, regulation, copyright

who holds the power now?

transference of resource, money and access

is this the cultural dark ages? so much of our art will not exist - nothing for archaeologists to look at - will we be the hole in the canon?

new classes created

social and economic costs

nostalgia and craft and identity

impact of servers and just running the Internet - what does that mean for the future of creative technologies

e2e encryption and the difference between physical and digital privacy

who holds the power?

what are the ethics of AI generated content

archiving

new kinds of labour created

Copyright & legal implications

frictions and impacts of technologies being adopted

Server requirements

Climate impact

Creators compensated?

Unknown knowns

Postal service

illusion of what the tech is

centralised SM vs decentralised vs substack

Unknown unknowns

obsolete?

moonshot thinking without understanding how things work

Globalisation vs localised strengths

This high-level classification offers a starting point for surfacing some of the dark matter that accretes around different areas of knowledge.

Clearly observable trends and personal perspectives are shared on the left-hand side of the board. Known knowns are trends or activities unfolding in plain sight, visible to all or most of the workshop participants; unknown knowns are pieces of expert or contextual information only available to the individual making the observation.

The right side of the board is a space for sharing observations that happen at one or two removes from the clearly observable; known unknowns are things participants have observed but do not necessarily understand or can offer context for; unknown unknowns are new areas of enquiry that unfold during the process.

Topics that surfaced on the right-hand side of the Implosion boards were then grouped and mapped by the Careful Industries team.

1.2   Seven preoccupations

The Careful Industries team then developed these preoccupations and emerging trends into seven vignettes that combined participants' observations with research outputs from the grey literature review.

These vignettes draw on observations made about the emerging state of the creative industries by project participants: they bring together second- and third-order effects of observable trends with expert knowledge to offer a range of probable outcomes and dilemma spaces.

I.   High tech vs low tech

There is a significant gap emerging between the uses of 'high tech' and 'low tech' in the creative industries. On the one hand, highly advanced technologies are transforming the world of visual effects, requiring more specialist skills[2]; on the other, independent creators have access to a wide-range of free and very cheap off-the-shelf tools and apps with 'what you see is what you get' (WYSIWYG) interfaces that require little or no technical training to operate. These two approaches have very different implications for the creative workforce and the future skills pipeline and require different accompanying business models and routes for commercial exploitation.

II.   Support structures are out of date

Digital business models are changing the way some sections of the creative industries workforce work, creating new demands of existing support structures including intellectual property, contracts, payment and taxation models, and the role of intermediaries such as agents and managers[3]. Questions of moral and human rights are coming to the fore as AI and automation become more prevalent[4], while dependence on digital platforms is introducing new forms of uncertainty for some parts of the creative industries.

III. New aesthetics

Digital aesthetics are shaping new kinds of art forms, such as generative art and NFTs, and creating financial value in ephemeral, virtual assets – what does that mean for the creative industries over the next 10 years?

IV. Technical obsolescence and the circular economy

There is an ongoing tension between the push towards reuse and circularity with ongoing technological advancements and shifts in business models that make hardware and software obsolete and incompatible[5]. The environmental impact of new technology use in the creative industries – including the data storage and compute power demanded by generative AI models and other emerging technologies – create an important set of challenges, often in tension with the push to innovation.

V. Representation and inclusion

While there may appear to be more inclusion and diversity in the creative industries, money and power still tend to sit with traditionally powerful actors, and there are concerns that innovation is valued over safety of marginalised people[6]. Meanwhile, audiences are demanding more representation but there is a risk that this diversity is commodified and seen as novelty.

VI. Deep fandom

Deep fandom is being leveraged across traditional verticals and formats, and existing story worlds and intellectual property rights are being mined and extended – both formally, through brand extensions and 360-degree commissioning, and informally through fan fictions and interventions. Interest groups that previously presented as niches are benefiting from the network effects of digital distribution to become highly profitable markets.[7] As Bobby Duffy comments, *"People of all generations are identifying more with their own group and differentiating themselves from others"* (Duffy 2021), with brand and story affinities being used as markers of personal identity.

VII. Algorithmic co-curation

Content discovery is increasingly driven by algorithmic recommendations and digital-first content is becoming increasingly data driven, shaped by audience approval[8]. This can make it difficult for content and creators to break through and also risks leading to algorithmic smoothing of taste. Data and algorithmic bias might also risk entrenching social divisions and access to content and experiences[9]. How might the creative industries shape algorithmic co-curation, and what impacts might this have on creative practice and outputs?

1.3   Probable and emerging outcomes

These preoccupations were used as stimulus for a second set of workshops and a process of consultation and co-creation with the project team. The second round of workshops focussed on future potential policy interventions, working backwards from identified possible and plausible futures to understand probable and emerging outcomes for the creative industries[10].

Through this process we identified three sticking points. The next section unpacks these sticking points in more detail.

2

Sticking points

The seven sets of preoccupations outlined in Section 1 relate to very broad swathes of activity. In order to narrow these, and informed by outputs from the future policy-development workshop and ongoing desk research, we proceeded to look for connections and overlaps.

Through this phase, we paid particular attention to factors that occurred in the context of more than one preoccupation; the purpose of this was to identify effective leverage points, where one intervention might contribute to a range of alternative outcomes.

The areas of connection we identified tended to be clusters of social, economic, and technical conditions. Some of these conditions were enablers for change in the current innovation environment; others were inhibitors. Using the Three Horizons Model (Sharpe 2020), we mapped these factors to understand points where Horizon Three – what Sharpe terms *"pockets of the future found in the present"* – intersect with the prevailing technologies, ideas, and infrastructures of Horizon One and the more incremental shifts found in Horizon Two.

Our assessment was that these points of intersection created tensions, which we have termed 'sticking points". These are places where a number of countervailing forces meet and interact to heighten uncertainty. In each of these cases, the sticking points make a range of different near–future outcomes – including regression, progression, or deadlock – possible.

Figure 4: Three Horizons Model with sticking points, Bill Sharpe, H3Uni.org (2019)
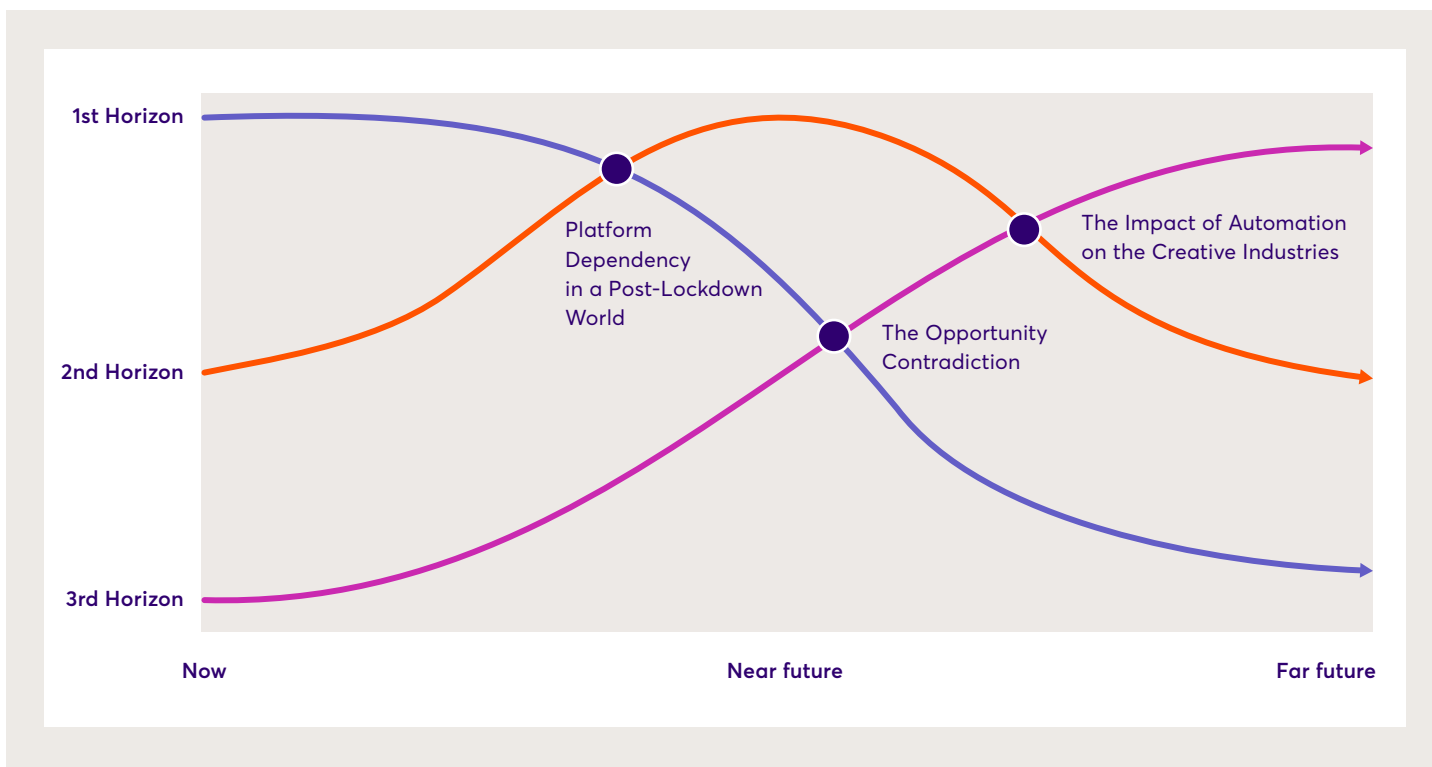
These sticking points are:

1. **The opportunity contradiction**

   The means to create and distribute creative content has been democratised by digital tools, platforms, and Internet connectivity – however the creative industries are not yet representative of the UK population. This contradiction creates a possible future sticking point not just for workforce growth, but for market reach and future propensity to innovate.

2. **The impact of automation on the Creative Industries**

   It seems probable that narratives about the potential impact of automation on the creative industries are (and will continue to be) heightened – but it is difficult to predict exactly how heightened.

   Our findings suggest that overly optimistic predictions about the potential of automation to rapidly transform the creative industries do not give sufficient weight to frictions produced by the interaction of human, social, and economic factors. Automation will clearly have some impact on the creative industries in the coming five years, and there is a need for useful capabilities and infrastructures to improve resilience and adaptability. The 'known unknown' in this case is the speed at which this change will occur.

3. **Platform dependency in a post-lockdown world**

   Pandemic-era norms have yet to emerge; this makes data-driven decision-making difficult for many creative businesses, giving rise to new levels of uncertainty. This uncertainty is increased by the propensity of platform businesses to pivot quickly in response to changing conditions; responding to this may come at the expense of building anticipatory and strategic, market-shaping capabilities.

These sticking points were expanded and interrogated through further desk research and qualitative interviews; a summary of our findings is given in the rest of this section.

2.1 The opportunity contradiction

Relates to	Factors
High tech vs low tech; support structures are out of date; representation and inclusion	Commercial implications; workforce; propensity to innovate

The 'do it yourself', low-tech revolution of the last two decades shows no sign of abating.

The rapid improvement of consumer technologies such as smartphones and cloud storage and the abundance of free and easy-to-use Web services and apps means that the technical and financial barriers for creating and distributing media have been dramatically lowered.

A person or team with a good idea no longer has to master complex technical skills, buy expensive equipment, work with large specialist teams or be 'discovered' by a major media company to get their idea out into the world. This process of disintermediation – which BBC creative technologist Henry Cooke described as a *"shifting system of gatekeepers"* – means that auteur creators can use consumer and platform technologies to create, publish, promote, and collect revenue without being constrained by industry conceptions of genre and format[11]. Entertainers such as Alice Levine, Munya Chawawa, and Dan Middleton are prominent examples of 'breakthrough' digital artists whose audiences follow them across media formats and distribution opportunities[12].

However, a 2021 report for the APPG for Creative Diversity found that:

> Women, racially minoritised people, those with a working class background, people with a disability, and those living outside of London and the South East, are all significantly underrepresented in the creative and cultural industries, particularly in senior decision-making roles and key creative professions (see for example Bain, 2019; Brook et al, 2020; Creative Industries Federation, 2014; Conor et al, 2015; Giles et al, 2020; Oakley et al, 2017; Randle and Harvey, 2017; and Saha, 2017). This is despite greater financial returns for companies with more women and racially and ethnically diverse workforces (Dixon-Fyle et al, 2020), greater likelihood of innovations and success in international markets (Nathan and Lee, 2013) and higher chances of producing 'game changing' hits (de Vaan et al, 2015). (Wreyford, O'Brien, and Dent 2021)

This contradiction was brought to life by one interviewee from the broadcast industry who commented that:

> The creative industries have simultaneously never been more porous [but] at the same time traditional areas of content creation or curation find it persistently difficult to open their doors to a non-elite group.

2.1.1 Possible commercial implications

It seems probable that the 'Opportunity Contradiction' is reshaping commercial markets for creative content and products in a number of ways. Our hypothesis is that the following factors are contributing to the wider trend of audience fragmentation:

1. A tendency for some established commissioners and programmers in mainstream media outlets and cultural institutions to hold on to Horizon One, leading to reduced profile for some diverse creators and reduced audience appeal for underserved and diverse audiences

2. The opportunity for some underserved creators and audiences to take a 'self-service', Horizon Two approach, using social and self-publishing platforms to bypass established models and develop relationships directly with audiences

3. The risk that creators who self-serve in this way are also responsible for supporting their own distribution and publicity; while this can be very lucrative for a few, for others this may limit both their potential audience and the resulting commercial opportunity

Overall this encourages the creation of a more fragmented audience, in which specific groups are deeply bound by 'in-group' preferences. This has the effect of shrinking the mainstream and reducing the number of potential crossover events that will appeal to multiple audience segments.

2.1.1.1 Horizon one commissioning

Several interviewees expressed the view that some high-profile commissioning, programming, and acquisitions strategies were not keeping pace with either creative output or audiences' interests.

Literary agent Rachel Mann gave the example of publishing Jade LB's *Keisha the Sket* in 2022. LB originally published the novel on social media in 2005, and the text became a cult classic for young black women. The book then took seventeen years to find a publisher, despite being *"for Black Brits as fundamental to canon as Shakespeare and Dickens"* (LB 2022; Darko 2021). Mann commented that although *"the commercial imperative"* to meet diverse audiences' needs had changed

The system hasn't changed to get through more representative acquisitions… [even though] the money that there is to be made through untapped markets is significant.

Speaking to arts and culture, another interviewee shared that:

Audiences respond better when you're responding to climate change, diversifying collections, having open conversations about restitution; but boards, funders, and government respond less well, so that's a big challenge.

In the report *The Creative Majority*, sociologist Sam Friedman describes this disconnect as being due to:

> A kind of historical legacy of who's done this kind of work in the past and how they've been able to embed, even institutionalise, their own ways of being that still, in the present, are able to shape taken-for-granted ideas about who is appropriate to promote and progress, and that's basically the legacy of white, privileged men in this country in almost every elite industry. (Wreyford, O'Brien, and Dent 2021)

2.1.1.2 Self-service subcultures

Digital tools and platforms enable content creators to skip past the institutional layer and build relationships directly with audiences. While these platforms are subject to what one interviewee termed *"a different set of gatekeepers"* (explored in more detail in Section 2.3), they are not inhibited by the Horizon One behaviours described above.

Musicians and short-form video creators may be among the most well-known digital creators, but there are also sizeable numbers of podcasters, journalists, indie game creators and creative writers who publish directly to audiences. Overall younger audiences (under 34) show greater curiosity to explore digital-first formats, but as both audiences and formats mature they attract a wider range of audiences over time (YouGov 2022; Ofcom 2022a).

Despite being one of the first new formats of the smartphone era, podcasting has remained a plural medium; in the UK charts, successful local independent productions rub shoulders with, and often outnumber, content produced by major media companies[13]. Polling at the end of 2022 by YouGov found that 'listening to podcasts' was the second biggest growth driver for UK audiences after attending more live and in-person events (YouGov 2022), and the growth of political podcasts and recent migration of established talent from linear broadcast to on-demand and streaming audio indicates a degree of format maturity. Meanwhile, self-publishing tools such as Substack are giving established writers and journalists the chance to build their own brands, audiences, and revenue streams (Maher 2023).

The success of a social community is not just its size but the level of engagement shown by its members: Reddit, Discord, and Facebook are bustling with smaller, organic fan communities who enjoy talking to others about their favourite podcasts, games, and serially published ebooks, often in forensic detail. While these smaller fandoms may not realise significant income streams for creators, they can often be relied upon to support hosting and other costs through crowdfunding campaigns, merchandise sales, and tickets sales for live events; this model enables creators to maintain a degree of creative and commercial independence.

Meanwhile, the continued and growing success of social video platforms with younger demographics (Ofcom 2021; 2022a) can be inferred to demonstrate an affinity for a wider-range of creators and types of content than is currently found on established broadcast and media platforms.

2.1.1.3 Community as a distribution channel

Creators with the time and financial means to invest in what Henry Cooke termed *"discoverability, getting found, building and retaining an audience"* can unlock significant loyalty.

For instance, fantasy writer Brandon Sanderson, who recently raised over $4.1 million to fund the self-publication of four books[14], is well-known in the science fiction community for nurturing deep relationships with his fans (Codega 2022), while Jimmy Donaldson (Mr Beast), recently named by Forbes the first *"YouTube billionaire"*, is understood to closely analyse community activity to optimise the contents of his stunt videos (Colin and Samir 2022; Forbes 2021). These levels of financial success are extraordinary rather than representative, but they do point to the fact that, even after platform deductions, significant revenue is in some cases flowing directly to creators rather than through traditional media companies and intermediaries.

However, not every creator is in a position to optimise their online presence. Community cultivation takes time and money, and this investment may not be possible for creators with other commitments, such as paying work or caring responsibilities.

The lack of publicity and distribution support for independent creators also means that earnings for creators from Black and other minoritised backgrounds may be capped because creators are staying within well-defined niches and so not reaching their full potential audiences. Given that the 2022 UK Black Pound Survey estimates that *"the average monthly disposable income of the Multi-Ethnic consumer is £375 million equating to an annual disposable income of £4.5 billion"*, the potential of this relatively untapped market would benefit from further investigation (Backlight 2022).

2.1.2 Possible workforce implications

Interviewees from arts and culture, publishing, public-service media and broadcasting all referred to Horizon One behaviours within gatekeeping organisations that maintained the status quo. Speaking of the art world, one interviewee shared:

There is no alternative model that is not fancy parties in London and private views – the cultural sector in established institutions is not accessible to people who are not middle-class, tertiary educated, and who live with someone who can support them – and there are huge challenges facing those organisations in terms of diversity and inclusion and equity and belonging, which means there are big challenges to relevance and [ensuring they are] a place where people might want to work.

Literary agent Rachel Mann commented:

> Publishing is an industry that thrives on canon and elitism and doing things in ways they have always been done … all the parties and the meetings are still in London, and because we fetishise the industry in a certain way it is exclusive – the majority of the manuscripts in my submissions inbox are written by people who have the time and resources to write.

The networked shift outlined above may also change creative workers' future conceptions of status and success in the creative industries. For instance, current high-status institutions and professions that are not inclusive or well-paid may, over time, become less attractive to workers who can use digital tools and platforms to reach audiences and revenue directly.

2.1.3 Possible innovation implications

This lack of permeability between the mainstream market and independent creators may also stifle informal digital innovation – the kind that takes place in social spaces rather than in firms.

Flexible portfolio careers have long been commonplace in the creative industries, with many creative practitioners supporting their practice by combining freelance work with second and third jobs and short-term contracts (Harry Josephine Giles 2020; The White Pube 2020; Comunian and England 2020; Eikhof 2020). For freelance creators, artists, and producers, the ability to seize opportunities to build audiences and create new work is an essential economic activity (Davies 2017; Potts et al. 2008) so it makes sense that creative practitioners have been drawn to experiment with social media platforms and new digital tools. However, this informal cultural production is not always visible beyond its immediate context and can be considered to be transient and gossamer. Three interviewees discussed the extent to which innovations rooted in either popular culture or in particular subcultures or younger age groups were not always 'legible' to senior figures in Horizon One organisations, and so might either be dismissed as trivial or simply misunderstood.

This informal activity, which leads to network building and audience creation, often takes place in a liminal space: in public, but – for those operating outside of the commercial influencer economy – often unmonetised[15]. Referring to Twitter, Rachel Mann observed that *"because writers are sitting at home trying to create, they like to talk online"*, while Dr Jo Twist of UKIE described the importance of Twitch and Discord servers to indie games producers, saying *"games are nothing without their communities"*. Similar activities can be seen on Instagram, TikTok, and YouTube which many visual artists and performers use to workshop and create new work (TikTok 2019; Moss 2021).

The result of these online habits and behaviours is a symbiotic relationship between creators and the platforms they use; content creation has helped to shape the platforms and, in turn, creators benefit from being able to share their work. But this value exchange is often asymmetric and opaque, particularly for creatives and practitioners without access to traditional support structures (Doctorow and Giblin 2022; Bishop 2021; DCMS Committee 2022). Deborah Williams OBE, Chief Executive of the Creative Diversity Network, described this as part of a wider pattern in which *"innovation comes from those with the least"* while the value *"goes to those with the most"*.

2.2 The impact of automation on the Creative Industries

A note on terminology: in the following sections, we use the term 'AI' in its broadest sense, to mean 'data-driven automation'.

Relates to	Factors affected by this include
High tech vs low tech; new aesthetics; representation and inclusion; support structures; algorithmic co-curation	The human process of technical adaptation; the impact of hype and narrative; the changing shape of the workforce; new ethical dilemmas

The workshops and interviews took place between December 2022 and February 2023, at what may prove to be the peak of speculation and excitement about ChatGPT-3 and other generative AI technologies.

It is notable that automation – rather than the broader CreaTech sector or any other emerging technology – was front of mind for some workshop participants. In the workshops, speculation on necessary future policy developments tended to assume that generative AI products would rapidly reach their full potential. Interviewees were on the whole rather more sanguine, tending to focus instead on the additional capacity that automation might bring and the potential human factors – such as skills, ethical concerns, and creative capacity – that would affect the rate of adoption.

This disconnect between the extraordinary imagined potential of AI and the more mundane expectations of those working with it day-to-day is a signal in and of itself.

A pragmatic view of our findings would suggest that the imaginary potential of AI to replace human creativity is currently being over-hyped and so is not an accurate indicator of the future progress of Horizon Three. What is less clear is the extent to which this hype 'runs hot': whether our interviewees were speaking from the reality of delivering incremental change in Horizon Two, or from the transformational perspective of Horizon Three. If the former, it is possible that interviewees were under-rating the potential of AI; if the latter, it may be that the rate of technological transformation in the broader creative industries is less vertiginous than in a 'pure play' technology environment. Our interviews suggest that the process of creative and human adaptation requires facilitation, at least in the short term, as well as a range of supportive infrastructures, including high-quality data sets and agreed legal frameworks.

2.2.1 Adapting to new technologies

It's almost like creating a new space for a craft to emerge, which doesn't necessarily replace the old one, as the old one is still more developed. [...] That just creates a new area for human creativity.

Alex McLean, musician and researcher

The sudden emergence of tools that can generate or edit images and texts (such as ChatGPT, Lensa, and DALL-E) is creating new uncertainties for the sector: some commentators view these tools as a threat to creativity and an attempt by the tools' creators to insist that art produced by humans has no meaning (Golumbia 2022).

However, all of our interview subjects interpreted automation as having a much broader definition than these generative tools, discussing the potential for AI to enhance rather than replace human-computer workflows. The outputs generated by AI were regarded as ways of augmenting creative work rather than as a full replacement, and several interviewees shared the fact that they sometimes used automated tools as a way of 'warming up' and 'filling in the gaps, creating previews to visualise things much sooner'. For Aardman CTO Steven Shapiro the overall goal of using automated tools is to *"leverage and apply new and existing technologies and apply them so people can improve their quality of life."*

In considering the near-future applications of automation, workshop participants – who worked backwards from the future to the present day – were more likely to see both the positive and negative transformative potential of these technologies for creating entertainment experiences. The practitioners we interviewed – who worked forward from the present – were more likely to be grounded in the realities of facilitating human-machine collaboration.

Sarah Ellis, Director of Digital Development at the Royal Shakespeare Company, was pragmatic about the pros and cons of automated processes, saying:

[AI] currently cannot provide a humanistic approach to care within job roles, but what it can do is provide systematised efficient, accurate productivity, which could be better than a human interface.

This was reflected in discussions of how people are important to facilitate automated processes. Steven Shapiro characterised his role as a CTO as being *"a conduit between technology and creativity"*, while Hannah Redler-Hawes (curator and Director of the Open Data Institute's Data is Culture programme) offered a reminder of the importance of *"carving out the space for humans, and carving out the space to respond to the impact [automation] has"*. This ongoing mediation is an intentional practice, and it is not one that can be taken for granted, particularly while the moral and legal norms of using automation are still in flux.

Contrary to the exciting narratives that fuel hype around new technologies (see Section 2.2.2) many of the uses of automation that interviewees shared tended to be administrative or preparatory, focussed on replacing what Dr Caitlin McDonald called *"onerous tasks"*, while Dr Jo Twist asked, *"Why would you make a chair [in a game], when you can adapt the one from Unity?"* The potential for automation to free up both time and *"the whole realm of computer language"*[16] was regarded as a significant opportunity, although the labour of implementing and supervising automation was frequently invoked as a counterweight to the additional time it might create.

While digital art is a well-established field, the acknowledgement of AI as a potential creative material was still tentative for several interviewees, particularly for those working in larger teams and established organisations.

Exceptions to this included Alex McLean, who spoke about how his practice as *"as a live coder… is turning programming languages into artistic material or artistic language"*, while Dr Jo Twist shared the extent to which the engagement of the games industry with technology *"over the last forty years"* resulted in more confident creative applications of emerging technologies:

> From a games perspective, AI and games have gone hand in hand. A lot of AI is trained in games – for instance using Grand Theft Auto as training data – and there's a lot of sophistication with NPCs [non-playing characters] because you can use AI to get more interaction. Hello Games and No Man Sky are entirely procedurally generated.

2.2.2   Coming to terms with hype

All of our interviewees could see positive and negative outcomes of increased automation in the creative industries; none invoked it as an existential threat to creativity specifically or to the creative industries overall. In workshops, however, the speculative, near-future potential of generative AI to overtake all aspects of the creative industries had much greater traction.

The reasons for this are not readily apparent, but we speculate that some potential causes include:

- Pragmatism about automation tended to reflect familiarity with existing workflows and rates of transformation within existing Horizon Three innovation projects. This was an embedded view, situated in the reality of delivery, and perhaps tempered by the practical challenges of intersections with Horizon Two.

- High-levels of engagement with automation – and the ability to imagine significant disruption – tended to reflect a less hands-on, more strategic engagement across multiple sectors. This technical optimism may have under-rated the friction of human factors and over-rated the speed of technological progress; this was perhaps enabled by the speculative freedom of being remote from delivery responsibility.

- Many of the technologies that disrupt the creative industries are developed in other contexts. The symbiosis between social networks and creative practitioners discussed in Section 2.1 shows how new opportunities can emerge from the creative industries absorbing and adapting new technologies on its own terms; the vulnerabilities to platform pivots that we raise in the next section demonstrate some of the risks of simply reacting to rather than being able to absorb and adapt to a complex or emerging technology. We suggest this disconnect gives rise to an overall mood of technical ambivalence for some leaders and practitioners not directly involved with CreaTech.

Hype is an established part of the new technology adoption cycle – so much so that technology consultancy firm Gartner regularly updates its *"hype cycle"* ('Gartner Hype Cycle Research Methodology' 2023). The predicted rise, fall, and rise again of a technology from the initial *"Innovation Trigger"* to the *"Plateau of Productivity"* is now an industry standard indicator of a technology's maturity. At the time of writing, Generative AI is at the *"Peak of Inflated Expectations"* (Gartner 2022), an early adopter space that Gartner characterises as *"produc[ing] a number of success stories – often accompanied by scores of failures"* ('Gartner Hype Cycle Research Methodology' 2023).

These early success stories can be destabilising and as George Oates, Executive Director of the Flickr Foundation, commented, *"a lot of the utopian promise of Generative AI is hot air about unimaginable scales and hugeness"*. Goldfarb and Kirsch's history of innovation Bubbles and Crashes (2019), which examines 150 years of technology hype, puts this diffusion of early stories into historical context:

> When investors have trouble understanding how a new technology will fit into a system… this will encourage investment… Different types of investors will get caught in different webs of stories…. The longer it takes for these competing narratives to resolve, the more time is available for speculation to develop.

Goldfarb and Kirsch set out four likely causes of speculative bubbles. These are:

1. The nature and degree of uncertainty surrounding the innovation

2. The existence of 'pure-play' firms whose fortunes are tightly coupled with the commercialization of the innovation

3. The availability of narratives that coordinate and align beliefs about the likely development of the innovation

4. The presence of novice investors to fund these firms

At the time of writing, all of the above can be said of generative AI, and the hype is being further fuelled by high levels of investment from Microsoft and Google (Waters 2023; Waters and Kinder 2023). The objectives of those investments are not yet clear, leading to more ongoing speculation, further compounding the hype.

In *The Innovation Delusion*, Lee Vinsel and Andrew L. Russell (2021) offer a close reading of the ways narrative is deployed in the early stages of the hype cycle. Their conclusion is that what they call *"Innovation speak"* happens at the intersection of optimism and fear, making it *"a dialect of perpetual worry"*, designed to reduce confidence and cultivate market uptake rather than promote genuine technical understanding.

2.2.3   Jobs and automation

The House of Lords Communications and Digital Committee report At Risk: Our Creative Future stresses that the scale of automation in the creative industries cannot be predicted, addressing in particular the workforce risks produced by precarity and low pay in the sector (Lords 2023).

One factor that does not surface in the Lords' analysis is that the implementation of automated processes is a skill in itself, and is not without some friction. Peter Law, Executive Producer at creative agency Flying Object, commented that *"the blocker"* to further automation *"is a sort of inertia. It takes a lot of energy to work out how we work. And then it takes more energy to change it."* Getting over this inertia requires a forcing function. Steven Shapiro described how the Covid-19 pandemic provided an animating force for a different technological change, instituting remote and hybrid working:

> A side effect of the pandemic is that external forces required changes that would have been difficult to catalyse without the pandemic: for instance, digitising the writers' room. Typically the way it works in most film and TV series is that a bunch of people get together in a physical room and put notes up on boards and visualise what the story might be – taking that and putting it in the digital form wasn't something they wanted to do, but those external constraints made it necessary.

Shapiro went on to explain that the creative team had yielded many benefits from the flexibility that hybrid working enabled, but that facilitating this change required continual care and maintenance:

> I do believe the way forward is a hybrid way of working, but that's the most challenging model to fit in in a creative environment: you have to account for people being in person and remote, and there's a lot of accommodations. But I've also seen a lot of people adapting in interesting ways and leveraging the tools in different ways, such as working with people in different geographic locations.

This was supported by Alex McLean's assertion that, *"when you try and automate something, you still have to look after it to keep it running"*, and it is important to remember that few technologies run without any kind of human supervision.

It also seems probable that automation will roll out incrementally through the creative industries, sometimes in ways that are not visible to policymakers. The elasticity of some creative and cultural working patterns can make it challenging to size the freelance and portfolio workforce in detail. While it is possible to understand types of employment at a high level (Comunian and England 2020; Easton and Beckett 2021; Bakhshi et al. 2021), the flexibility of practitioners with blended working patterns – for instance, people who subsidise either creating their own work or establishing their artistic career with a variety of freelance or contract activities, such as teaching or delivering creative services – is not always visible to the data.

Some interviewees raised the possibility that the demand for freelance background artists (Lords 2023), voice-over artists (Cecco 2023), commercial artists (Salkowitz 2022), and copywriters is likely to shrink: reducing access to these kinds of secondary and

complementary income streams might have the unintended consequence of reducing the size of the overall creative industries' workforce. Participants in our backcasting workshop worked through the ripple effects of this: a theatre director who loses their side-hustle as a film extra or a copywriter might have to swap their portfolio career for a secure job in a different industry. Several interviewees shared anecdotal examples of this occurring to colleagues and collaborators over the previous twelve months, but it is not clear if or where these statistics would be captured, and how they might be anticipated at scale before creative commissioners and producers are faced with scarcity (McDonald and Jordan 2023).

2.2.4 Social, ethical, and legal norms

Automation within the creative industries raises a number of ethical challenges; the following is a small sample of potential issues, based on topics that arose during our qualitative research.

For practitioners we interviewed who already work with automation, data quality was a recurring issue, building on concerns raised in the wider machine learning and ethical AI communities.

It is now a well-established principle in machine learning that many large language models and large-scale data vision sets do not draw upon representative data sets and so create biassed outputs (Prabhu and Birhane 2020; Bender et al. 2021; Crawford and Paglen 2019). The demand for very large training data sets can mean the overall quality of data can be low and self-reinforcing. For instance, the corpus of data trawled by OpenAI's GPT-3 contains the English text of Wikipedia and WebText2, a dataset containing all websites linked from Reddit[17]. Both of these data sets over prioritise the input of a technically savvy, male-skewing demographic sub-sector: for instance, an analysis of Reddit demographics by technology magazine Alphr in 2021 uncovered "a picture of a younger, majority white and male audience with access to higher education" while one-third of all English-language articles on Wikipedia have been edited by one man, named Steve Pruitt (Sattelberg 2021; Eghbal 2020; Wikipedia 2023).

Building high-quality large datasets is expensive, and is another stumbling block for creative businesses wishing to use AI. Steven Shapiro, CTO of Aardman, shared that:

> The machine learning side of our business and technology is still very immature because of the high levels of data needed to train the network: if you train a person there is a lot that they are able to gather and create themselves but the network that you're training with machine learning does not have that flexibility. The automated system will be biassed and only be able to use what you're putting into it: that's a very challenging set of problems that are not going to go away any time soon.

The process of using new technologies and building new data sets also brings renewed uncertainty and legal and moral challenges. George Oates of the Flickr Foundation noted that the creative industries needed more long-term thinking about data stewardship, including:

> The programmatic use of creative materials at scale, where these datasets will end up as a larger resource, and how they will be managed once they are there.

One interviewee shared the problems of using new types of data as a starting point for creative work, such as images of people:

> Legal teams and researchers are struggling with this, and there are more lawsuits. That means many people are steering clear of using data where there might be ambiguity, which is hindering growth in this area of technology. There is less investment in and application of those tools because of worry about the legal and moral implications.

There are considerable intellectual property concerns around using large data sets to generate new creative work. At the time of writing there are a number of legal cases in play between copyright owners and AI companies to establish new precedents (United States District Court for the District of Delaware 2023; Dixit 2023), while in the UK the need to *"to provide clarity on IP rules"*, particularly regarding to text and data mining, is an ongoing area of political concern, raised as a priority in the Chancellor of the Exchequer's Spring Budget speech (HM Treasury 2023; Hansard 2023). As anthropologist Dr Caitlin McDonald commented,

> [For AI art ethics] probably the areas I would focus on would be the use of other people's work, or other people's images of them, their voices and faces. I do think we're at a moment where there might be some clear moral guidance around that, but there isn't necessarily clear ethical and legal guidance.

Musician and researcher Alex McLean also made the point that independent artists are perhaps the most vulnerable to having their intellectual property exploited through automated tools:

> [There are] strong profit motives … [and] there are lots of people who don't have resources to enforce their own copyright, because it's such a small scale. They are the people whose styles are being ripped off, who rely on working within the realm of copyright.

The confluence of impacts on jobs with these social, ethical, and legal challenges highlights the range of new support structures that increased automation gives rise to.

On the one hand, individual artists and practitioners require training to enable them to adapt to the changing technological landscape, and also access to a new range of automation-era expert-led services and mechanisms to facilitate tasks such as copyright management. Meanwhile, several interviewees spoke to the difficulty of solving cross-sector problems – including lack of access to large-scale data, the social and ethical impacts of biassed data, and the need for new legal norms – through project-based funding and structures.

The need for interdisciplinary, cross-sector programmes of work that bring together firms, cultural institutions, creatives, and researchers to solve these and other emerging infrastructural problems was raised by interviewees working in a number of contexts, from funding through to production.

2.3 Platform dependency in a post-lockdown world

Relates to	Factors
High tech vs low tech; support structures	Data; business models; supply-side focus; workforce

2.3.1 The challenge of post-lockdown decision making

Decision making is difficult in 2023.

Audience and consumer behaviours in 2020 and 2021 were radically constrained by the Covid-19 pandemic and lockdown measures; meanwhile, it is not yet clear whether behaviours in 2022 illustrate the beginning of new norms or show an artificial level of bounceback. This uncertainty is felt even in data-driven technology companies. For example, in November 2022, payment company Stripe's CEO Patrick Collison published an open letter on the company's website that said:

> At the outset of the pandemic in 2020, the world rotated overnight towards e-commerce. We witnessed significantly higher growth rates over the course of 2020 and 2021 compared to what we had seen previously. As an organization, we transitioned into a new operating mode and both our revenue and payment volume have since grown more than 3x. The world is now shifting again. (Collison 2022)

The difficulty of confidently forecasting the outcomes of this next shift is cemented by a number of other uncontrollable external factors, including:

- The cost of living crisis and rising energy costs (Earwalker 2022)
- Pandemic-era shifts in social behaviours and working patterns (The Audience Agency 2022; Digital Cinema Media 2022; ONS 2022)
- Adaptation to the climate emergency (Rasbash 2022)

Interviewees shared how this intensification of uncertainty meant that some social and technical innovations of recent years have rolled back, with a suggestion that some leaders in Horizon One contexts had become more tentative in response to what economist Adam Tooze has described as the *"global polycrisis"* (Tooze 2022). For instance, although digital content production boomed in the cultural sector during 2020 and 2021, one interviewee observed that risk appetites had *"swung very quickly back"* to 2019 as *"the priority went back to getting people in the building"*, while Deborah Williams OBE observed that:

> Coming out of the pandemic, the push has been to go back to normal, [but] for a lot of people [that means] the infrastructure that pre-existed the pandemic, which was inherently unequal.

2.3.2 The power of the pivot on the Creative Industries

The ability of technology companies to both respond quickly to emerging conditions and, in some circumstances, set the pace of those conditions has had a range of specific impacts on different creative industries sub-sectors over the last two decades.

Shifts including the introduction of the smartphone, the impact of music streaming on the music industry and artists' income streams, the impact of Amazon on book publishing, and the disintermediation of broadcast TV have combined to reshape the creative and economic landscape of the creative industries. BBC creative technologist Henry Cooke characterised this as creating *"a shifting system of gatekeepers"* in which established institutions such as the BBC and individual creative practitioners were constantly having to adapt and relocate their practice.

Further shifts are probable, but interviewees shared frustration about access to limited horizon scanning to spot where these future changes might arise.One significant short-term risk to the creative industries is the potential for a slew of pivots to occur across the big platform technology companies. *"Silicon Valley culture is built around big pivots"* (Klebahn 2011) and, at the time of writing, US tech companies have cut almost 60,000 jobs in the last month (Ivanova 2023), while the site https://layoffs.fyi/ estimates that, in the first six weeks of 2023, 344 tech companies worldwide had between them laid of 103,767 members of staff. The impacts of these pivots could be far reaching.

In 2022, UK regulator Ofcom determined that:

Few digital communications and broadcasting services are delivered to end customers without the involvement of a multinational tech company, whether in the development, distribution, or through the device in the consumer's hand. (Ofcom 2022b)

Figure 5: From Ofcom's Approach to Competition and Consumer Issues in Internet-Based Communications Markets (2022)
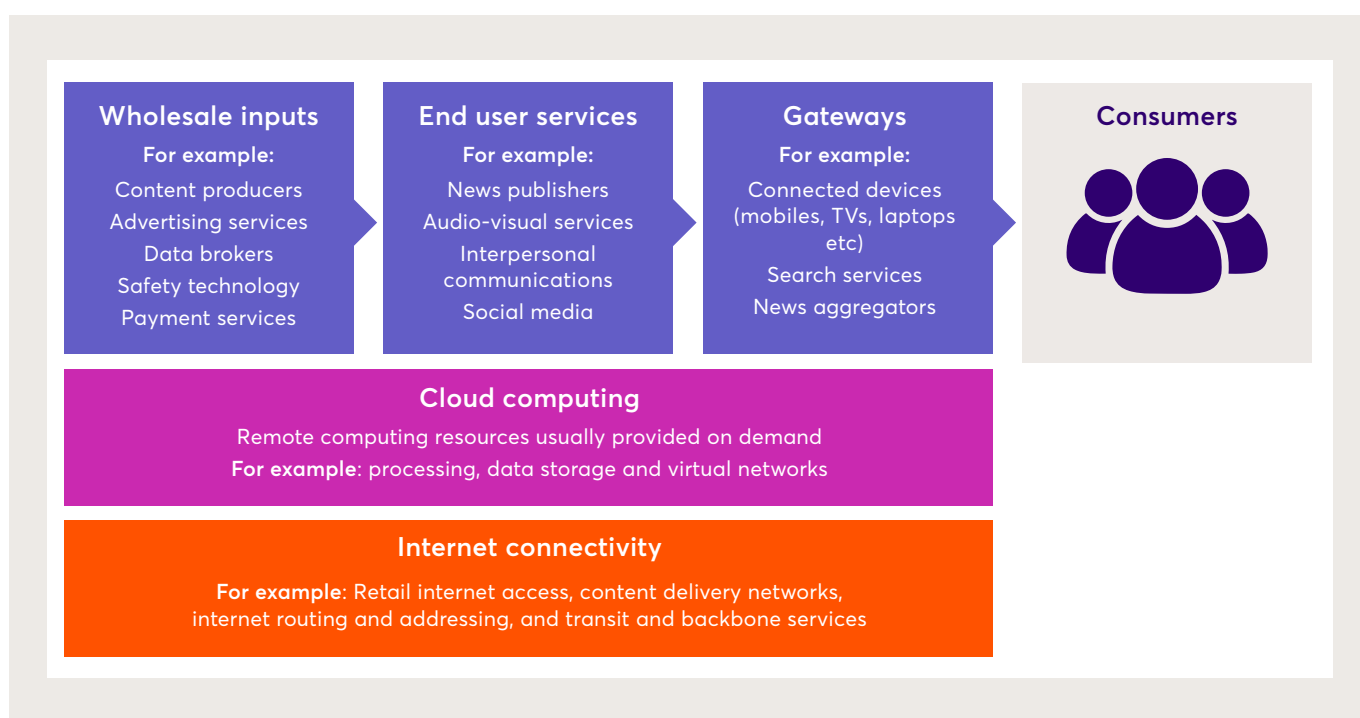
This means that a small number of multinational technology companies are gatekeepers for the underlying infrastructure that deploys content platforms, as well as the platforms themselves. As George Oates said,

> The raw materials of Flickr are stored on Amazon Web Services, along with most of the rest of the Internet and I see this as a risk for the longevity of the archive. Even though Amazon Web Services is absolutely technologically amazing, it is not in Flickr's control, and certainly not under any of the photographers' control.

Tech billionaire Elon Musk's acquisition of Twitter is one example of how a tech platform pivot can have diffuse impacts on the creative industries. Recalibration of the algorithm (Broderick 2023), changes to user verification methods including prioritising the rank of paid-for Twitter Blue users, and a predicted significant decline in the numbers of overall users (Sweney 2022) mean that Twitter's status as the Internet's *"public square"* (Pariser 2022) is changing. Creatives who built audiences and relied on Twitter as a direct route to market have lost a free and effective marketing and publicity tool, while new and emerging practitioners who have built their reputations and professional networks on the platform are concerned about the loss of access to peers and mentors (Vershbow 2023). The social and labour costs of building a presence on a new social platform are considerable, and equivalent levels of reach and influence may take many years to rebuild.

Although, as discussed in Section 2.2, it seems probable the first wave of pivots will turn towards automation, broader economic conditions may have other impacts on platforms' risk and investment approaches across their portfolios; this will have numerous second- and third-order consequences.

2.3.2 The power of the pivot on the Creative Industries

One area of rapid expansion that may be at risk of a future Silicon Valley pivot is the UK broadcast production sector.

Subscription Video-on-Demand (SVoD) platforms grew rapidly both in reach and in number during the first two years of the pandemic, with the total number of global subscriptions reaching 1.18 billion, the biggest annual increase on record (Ofcom 2021). While this growth has now tailed off, the market remains competitive, and *"there is significant pressure on SVoD providers to be more creative and innovative than ever"* (Ofcom 2022a). In particular, this has led to what Ofcom observe as a historic spike in high-end TV productions made in the UK in 2021.

This rapid expansion has highlighted a number of challenges felt by the UK production sector, including particular workforce shortages across visual effects, skilled production and craft. This has been exacerbated by freelancers leaving the industry during the pandemic and *"a slower pipeline of skilled new starters"* (Ofcom 2022a; Sweney 2022; Lords 2023). In spite of this, the drive to commission and create big budget productions continues and in September 2022, Amazon debuted the most expensive television season ever created, the £715 million show *Lord of the Rings: Rings of Power* (Gruenwedel 2022).

Both Amazon Prime and AppleTV are interpreted by industry analysts as being 'loss leaders' for the technology companies, designed to drive the purchase of other products. The impact of their high-investment, high-growth approaches is having a disruptive impact on more established media companies, but it is unclear whether either business has a long-term interest or commitment to streaming. Even Netflix – whose access to high budgets has been a disruptive force for UK broadcasters for the last decade (RTS 2018) – is finding the tech companies' investment destabilising:

> Amazon and Apple, new to the game and eager to stock their libraries, have been writing big-tech sized cheques that have raised costs for everyone. "We sit around and go, 'Can you believe what Apple's paying?'", Netflix's boss Reid Hastings said at a recent conference. (The Economist 2023)

These high levels of spend on-screen are also out-of-kilter with the slowdown in subscriber growth caused by market saturation and the cost-of-living crisis that all SVoD services experienced in 2022 (Ofcom 2022a). In particular, this has prompted Netflix to alter its business model, launching a basic tier with advertising at the end of 2022 and removing multi-household password sharing in early 2023 (O'Flaherty 2023).

In evidence to the Lords' Creative Future Committee, PACT – the independent producers' trade body – shared that:

> The current skills shortage is widespread across the sector, with all genres and all regions of the UK being affected. However, there are certain roles where the shortage of talent is far greater. In a review of the Production Industry Skills Shortage for Pact, 82% of respondents identified either unscripted production management, scripted production (line producer, production manager, production co-ordinator), and scripted production accountants as the single biggest area of shortage. (PACT 2022)

This mismatch creates a dilemma for the creative industries: Horizon One thinking would indicate that the current spike in demand points to a need to increase the skills pipeline for production and craft roles, but a skilled workforce of the required size may take years to build.

Meanwhile, the broader conditions of the polycrisis and the propensity of tech platforms to pivot means that there is no guarantee this demand will continue at the same levels while the workforce grows. For instance, the development of a strong library of archive titles or a change to Amazon Prime's cross-selling strategy might see the company reduce its commitment to new commissions; meanwhile, Apple could pivot away from its TV product and prioritise other forms of content or other hardware and subscription products.

Interviewees from the broadcast industry pointed to the UK's reputation as a centre of excellence for broadcast production, but this is not matched by spending power at a commissioning level, which positions the UK as a supplier, rather than a market shaper. One short-term mitigation would be to improve on-the-job training and reskilling for creative practitioners, enabling more flexibility for creative skills to move across the sub-sectors as demand arises, which could be further facilitated by increased capacity sharing across the sector. More strategically, this also raises the question of how the UK creative industries might be able to both better anticipate and influence demand as the streaming model reaches maturity, pointing to both a need for improved horizon scanning and analysis and perhaps a change in approaches to innovation and commissioning.

3

A new Horizon Three

Our analysis of the project inputs also pointed to another unfolding change: the fact that more than one Horizon Three is currently unfolding.

Figure 6: Three Horizons model with the networked shift, Bill Sharpe, H3Uni.org (2019)
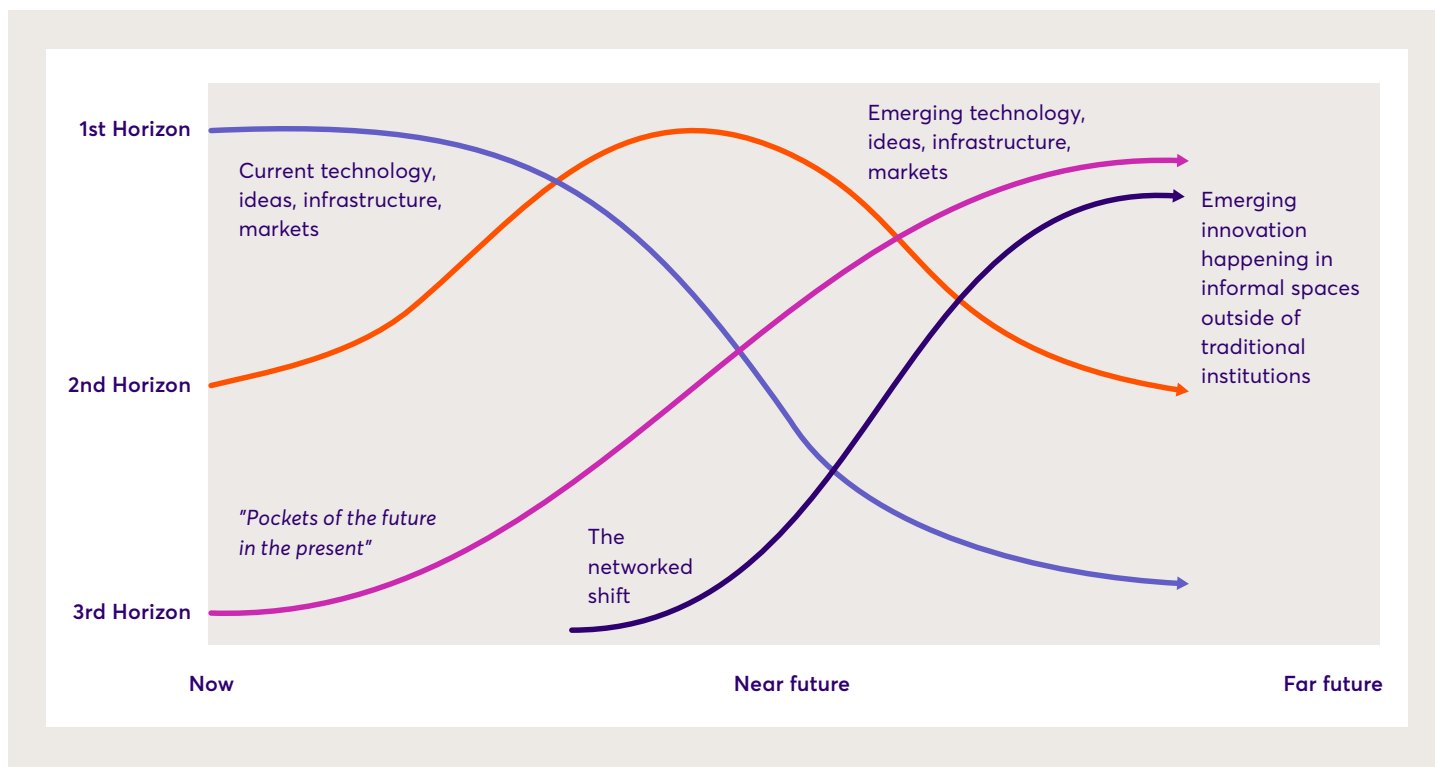
We have called this additional Horizon Three 'the networked shift'; this refers to a more digital-by-default, networked set of practices that are emerging across the creative industries.

As one interviewee put it, the modern creative industries are *"a mycelial network"*, relying on creating connections with others and the mutual transfer of knowledge and resources[18]. Drawing on findings laid out in Section 2, we observe that this networked shift is characterised by:

- The emergence of a more 'informal' and adaptive strand of the creative industries, across and between sub-sectors, and not necessarily aligned with existing definitions of R&D

- Operating outside of a sub-sectoral approach, both at the margins (via independent creators) and within market-shaping corporate actors, such as Disney

The following draws together signals from across the project that point to this conclusion.

3.1   Beyond sub-sectors

Policy-making for the creative industries is currently underpinned by an understanding that professions with a 'high intensity of creative activity' are divided into nine verticals, or subsectors, defined in part by the Standard Industrial Classification (SIC) Codes that creative businesses select when they first register with Companies House (Creative Policy and Evidence Centre 2022; Companies House 2021). These verticals are:

- Advertising and marketing
- Architecture
- Crafts
- Design and designer fashion
- Film, TV, video, radio, and photography
- IT, software, and computer services
- Publishing
- Museums, Galleries, and Libraries
- Music, performing and visual arts

However, in a global industry that is becoming defined by cross-pollination – one in which, for instance, Apple makes TV shows and Netflix makes games – the concept of 'sub-sectors' is no longer the only useful paradigm for understanding how innovation is sparked and developed.

Over the last two decades, digital technologies have made it easier for creative practitioners and producers to move across sub-sectors to exploit storyworlds and develop good ideas in a variety of media and formats. This has led to the development of immersive experiences such as ABBA Voyage and Lightroom on the one hand, and to the rise of the independent creator, as discussed in Section 2.1.

Meanwhile, platforms and technologies created in the games industry are crossing into other sectors: for example, Unreal Engine is used to render digital twins for real-world physical planning and games studio Improbable has a wing that specialises in defence and security, supporting 'accelerated response(s) to modern threats'. There is not a typical linear path that either a creative practitioner or a creative business might take to break through.

This shift is bringing more of the creative industries in line with ways of working and creating that are already common in the games industry. Dr Jo Twist of UKIE describes the UK games industry as being, *"all about change, its very fabric is all about creating these incredible worlds with technology"*.

Twist described how meeting audiences' needs – rather that emphasising the use of a particular technology or tool – is the animating factor of the industry:

we embrace tech because it's part of our business, it's how we create… [but the games industry] is not technologically driven or technologically deterministic. We use tech to create experiences that people demand so the very nature of that is disruptive.

This shift is inline with Potts et al.'s identification of the creative industries as having their basis in a communications, rather than an industrial, model, characterised by *"the adoption of novel ideas"*. Writing in 2008 – as YouTube gathered pace as a cultural and creative force – the authors propose that the creative industries *"are defined as the domain of new rules that are both ostensibly socially produced and consumed"* (Potts et al. 2008). Analysis of the outputs from this project suggests that this process of adaptation has gathered speed in recent years, so that what was previously regarded as *"hidden innovation"* (Miles and Green 2008) is now happening in plain sight, but beyond conventional categorisation.

3.2 Leveraging fandoms

The availability of higher-quality data about audience experiences is another driver, and deep pockets of audience interest – otherwise known as fandoms – are being leveraged across formats and verticals.

This shift towards leveraging fandoms is being adopted by big studios and independent practitioners, and is exemplified by the exploitation of brands and storyworlds across an increasing range of verticals. This signals a reorientation toward more networked and multidisciplinary types of creative practice, and away from works being siloed into sub-sectors.

Merchandise and 'TV tie-in' content extensions are well-established as ways to exploit intellectual property, and in recent years this strategic approach has been tweaked and amplified to meet the needs of growing fandoms: franchises such as Harry Potter, Star Wars, and the Marvel Cinematic Universe have expanded their creative content to grow audiences by simultaneously attracting and retaining multiple demographics.

In January 2023, The LEGO Group advertised for a Head of Membership Experiences, Deep Fandoms and AFOL (Adult Fans of LEGO), with the following responsibilities:

• Build collaborative relationships across digital and physical product, content and marketing teams, driving outcomes for the audience and business.	• Drive optimised user journeys which facilitate audience growth and conversion and sign up to membership.	• Leverage data and analytics to build a proven foundation of insights on audience needs and behaviours to guide audience growth strategy and objective setting.

This shows an explicit focus on using data to follow audience preferences and behaviours across traditional vertical categories.

The mechanics of cultivating such deep and wide fandoms are often speculated upon, and in 2018 researchers from INSEAD and the BI Norwegian Business School analysed publicly available information about the Marvel Cinematic Universe. They determined that Marvel's strategic approach was to *"leverage a stable core"* of characters and tropes across formats and genres by bringing in new talent and involving fans in co-creating storylines and generating excitement (Harrison, Carlsen, and Škerlavaj 2019). In order to meet the demands of their new streaming platform, Disney have applied the same strategy to *Star Wars*, with one commentator observing:

> If *The Mandalorian* is a Western procedural, but make it *Star Wars*, then what else could be done in this universe? Could you make a horror film? Could you make a political drama? Could you make a sitcom? (Quagliata 2020)

A similar model is used in the games industry, which Twist characterised as being both *"community driven"* and *"less top down and more adaptive"*, able to leverage technical capability to rapidly meet shifting audience interests and behaviours.

This expansive approach to exploiting intellectual property is also affecting the kind of creative talent likely to find mainstream success. Rachel Mann explained that platforms' desire to own and exploit ancillary rights has a ripple effect:

> Increasingly [successful authors] understand that they need to be the full package and that their work might be sold to a platform. Those writers have cinematic immediacy and an ability to create a brand as an individual.

Another external influence on the creative industries is the multi-sectoral presence of YouTube and Instagram influencers who – sometimes with the help of sophisticated management teams and multi-platform campaigns – have leveraged loyal audiences into customers for physical products. Kylie Jenner's $1 billion make-up line, Mr Beast's virtual dining experience, and Logan Paul and KSI's Prime drink[19] (Beast 2022; Partridge 2022; Ilchi 2019; Colin and Samir 2022) are all examples of highly profitable fast-moving consumer goods businesses, driven by a digital fandom. While this level of monetisation is still relatively rare, it speaks to the cross-sector mindset of younger audiences.

Similar mechanisms are increasingly being adapted and adopted by independent creative practitioners. High-profile UK comedians including James Acaster and Joe Lycett have been able to transfer loyal audiences between TV and streaming services, podcasts, and self-hosted, crowdfunded indie productions – leveraging popularity built on social media or via broadcast media to gain greater creative control (Lewis 2022; Fox 2022; King 2022), with the referred benefits of gaining an increased share of revenue and a direct, unmediated relationship with their audience, supported by Kickstarter and Patreon campaigns[20].

3.3 The networked shift

This networked shift is relatively diffuse, happening across sectors, at blockbuster studios and among independent creators. While all the components are familiar to anyone who has recently been reminded about a video game inspired by a new Disney+ show because they saw a TikTok hype video made by an influencer who became famous on YouTube, this cross-genre, cross-format, cross-media approach is not yet reflected in how the creative industries are supported.

As discussed in Section 2.1, the relational quality of creativity is well-suited to the networked nature of digitally enabled creation and production. It seems highly likely that this networked shift will continue to imprint itself upon the creative industries, outside of the formal constraints of SIC codes, and that this will help shape the pattern of the creative industries of the future.

4

Conclusion: The networked opportunity

By necessity, some kinds of innovation will initially form and flourish outside of traditional structures. As they mature, these new practices may coalesce and form new institutions and traditions – over time creating a new Horizon One – while others may diffuse, transform, or disappear.

This process of change takes place at different speeds in different contexts; in support of the networked shift, it seems probable that these changes will also take different forms to previous adaptations in the creative industries, eventually reshaping the institutions, infrastructures and markets that are needed.

The shift to more informal innovation we have noted here would benefit from the support of adaptive formal infrastructures that share characteristics with this networked shift; these would be more able to keep pace with the speed at which creative practice develops and focus on supporting the kinds of creative innovations that begin in and are unique to the creative industries. Doing so would also reduce the potential for technical ambivalence that we point to in Section 2.2, leading over time to increased technical confidence and resilience.

Network building as a catalyst for innovation

One expert interviewee shared their view that major funding programmes were under-rated as spurs to network building. They observed that the sometimes inadvertent networks that developed around funds often endured much longer than the short-term, more easily measurable and intended impacts of the original programme, commenting *"even when funding doesn't have the impacts we want, people learn a great deal"*.

Developing cross-sector collaborative networks would be a way of bringing together people and funding from across traditional sub-sectors and silos to provide infrastructure, share skills, and tackle big emerging challenges. The Creative Clusters, multi-sectoral networks funded by the AHRC, demonstrate the benefits of this kind of collaboration; while Creative Clusters are focussed on innovation-in-place, it would be useful to position new networks around specific emerging challenges.

These challenges might include:

- **Foresight and horizon scanning**. A shared capacity to observe and anticipate shifts and opportunities at the convergence of creativity, technology, and innovation, and develop approaches to measuring innovation that look beyond existing structures and siloes. To borrow a phrase from the US agency Intelligence Advanced Research Projects Activity (IARPA), this would help to 'mitigate technological surprise' and enable better forward planning to anticipate market shocks.

- **Emerging technology infrastructures**. Joined-up capabilities with the ability to focus on the kind of large-scale, cross-sector and multi-disciplinary problems that project-based innovation cannot support. Outputs might include the development of useful, high-quality data sets and the creation of new support structures to facilitate adaptation to the legal, ethical, and social challenges posed by emerging technologies. This kind of network could facilitate the incubation of copyright-management or payment technologies and the development of standards and principles to support the solutions to 'wicked problems' emerging around uses of technologies, including new legal precedents, to enable more equitable and rapid engagement with emerging technologies.

- **Workforce development**. Providing networks for lifelong retraining and skills development across the creative industries, at all levels of expertise, with a focus on solving the 'opportunity contradiction' we highlight in Section 2.1 as well as mitigating some of the workforce shocks we anticipate in Sections 2.2 and 2.3. This could offer training and reskilling that helps the creative workforce adapt to new technologies, facilitate human-machine interactions, and develop greater resilience in the face of changing business models.

This approach would ideally support the roll-out of a more adaptive approach across the creative industries of the kind currently seen in pockets across the creative industries: in tech firms that have been built to scale and pivot, in big studios with the multi-disciplinary capacity to make technical breakthroughs and create new markets (*The Economist* 2023), in CreaTech firms that have an adopted agile, user-centred approach more commonly found in the tech sector (Siepel et al. 2022), and among independent practitioners and artists, accustomed to the hustle of the creative economy. The skills and resources that underpin each of these approaches may not easily write across to the rest of the creative industries, but access to better information, more modern infrastructures, and a better supported workforce would build resilience, innovation capability, and technical confidence – enabling the creative industries to take full advantage of the networked opportunity.

Appendices

1: Contributors

Expert advisor

Annette Mees
Artistic Director, Audience Lab and Visiting Fellow, King's Cultural Institute

Experts interviewed include

Henry Cooke
Creative Technologist, BBC R&D

Emma Cooper
Knowledge Transfer Manager for the Creative Industries, Innovate UK KTN

Sarah Ellis
Director of Digital Development, Royal Shakespeare Company

Julie Freeman
Artist and Associate, Open Data Institute

Hillary Knight
Senior Consultant, AEA Consulting

Peter Law
Executive Producer / Head of Experiences, Flying Objects

Rachel Mann
Literary Agent, Jo Unwin Literary Agency

Dr Caitlin McDonald
Research Associate, Creative Informatics, University of Edinburgh

Alex McLean
Musician and Researcher, Then Try This

George Oates
Executive Director, Flickr Foundation

Hannah Redler
Director, Data as Culture Programme, Open Data Institute

Steven Shapiro
Chief Technology Officer, Aardman

Kim Shillinglaw
Non-Executive Director

Dr Jo Twist
CEO, UK Interactive Entertainment

Deborah Williams OBE
Chief Executive, Creative Diversity Network

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Endnotes

1. With thanks to Prof. Jessamy Perriam for sharing this technique with us.

2. See, for instance, Williams 2022 for recent commentary on this.

3. Doctorow and Giblin 2022 offers a deeper analysis of this.

4. See Section 2.2.4.

5. Crawford 2021 offers an analysis of the planetary cost of AI; the Cambridge Bitcoin Electricity Index offers a real-time view of electricity use by a range of technologies, including bitcoin.

6. See Eikhof 2020; Harry 2021; Sobande 2021 for examples of this.

7. See Section 3 for a brief overview of this.

8. See, for instance, Seaver 2022 on the implications of algorithmic recommendations for the music industry and the Netflix Analytics blog for an overview of how the streaming company uses data to shape customer experiences.

9. See Section 2.2.4.

10. Backcasting is a foresight methodology used to visualise a range of possible futures and work backwards to identify the possible events, institutions, policies, and skills that might bring about the futures visualised in the first round.

11. See Section 2.2.3 for a consideration of the impact of automation on the creative industries' workforce, and Section 2.3 for an analysis of some of potential risks created by this platform dependency.

12. TV presenter Alice Levine co-created the podcast "My Dad Wrote a Porno" with collaborators Jamie Morton and James Cooper; the podcast, which gained more than 430 million downloads, turned into a live show and HBO special (Nicol 2023); "Satirist, presenter & producer" Munya Chawawa has won a BAFTA-nomination and 1.5 million followers on TikTok for his quick turnaround self-produced parody sketches, which saw him hailed as "one of the breakout stars of 2020" by The Guardian (Joseph 2020). Dan Middleton (better known as Dan TDM) is a gaming YouTuber, New York Times best-selling graphic novelist, and voice actor who has appeared in the Netflix show Skylander Academy and the animated film Ralph Breaks the Internet (McGuire 2021).

13. At the time of writing, Global Radio and BBC Radio 4 hold one place each in Apple's "All Podcasts" Top 10 for Great Britain; the other eight spots are held by independent producers.

14. Sanderson's Kickstarter campaign, to support the publication of "four secret novels" raised over $4.1m in 2022, see https://www.kickstarter.com/projects/dragonsteel/surprise-four-secret-novels-by-brandon-sanderson?

15. See DCMS Committee 2022 for a more detailed breakdown of influencer culture.

16. Interview with Alex McLean.

17. According to Springboard, GPT-3 calls upon a filtered version of Common Crawl, WebText2, Books1, Books2, and Wikipedia.

18. The interviewee was referencing Simon Moreton in Clare Reddington 2022.

19. Mr Beast has several YouTube accounts, each with several million followers; at the time of writing, the most popular, @MrBeast, has 132,000,000 followers https://www.youtube.com/user/mrbeast6000 (accessed 8 February 2023)

20. One example of this is the comedian James Acaster who leveraged the audience of his three-part Netflix special to then self-host and sell his next special on Vimeo; he subsequently leveraged the audience of a successful podcast he co-hosts to crowdfund a self-produced audio sitcom and launch a music career.

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