The background features a dark blue, almost black, field with numerous vertical, slightly curved lines that create a sense of depth and movement, resembling a modern architectural facade or a series of light beams. Scattered across this field are several large, overlapping circles in vibrant colors: a large blue circle in the top left, a red circle in the top center, a large orange-to-red gradient circle on the right, a yellow circle in the lower middle, and several smaller red and blue circles in the bottom half.

Experimental Culture

A horizon scan
commissioned by
Arts Council England

March 2018

nesta

ARTS COUNCIL
ENGLAND

**ARTS COUNCIL
ENGLAND**

Contributors and authors

Harry Armstrong

Georgia Ward Dyer

Svetlana Karadimova

Hasan Bakhshi

Paul Gerhardt

Sam Mitchell

John Davies

Celia Hannon

Francesca Sanderson



**ARTS COUNCIL
ENGLAND**

About Arts Council England

Arts Council England champions, develops and invests in artistic and cultural experiences that enrich people's lives. We support a range of activities across the arts, museums and libraries – from theatre to digital art, reading to dance, music to literature, and crafts to collections.

Great art and culture inspires us, brings us together and teaches us about ourselves and the world around us. In short, it makes life better.

www.artscouncil.org.uk



About Nesta

Nesta is a global innovation foundation. We back new ideas to tackle the big challenges of our time.

We use our knowledge, networks, funding and skills - working in partnership with others, including governments, businesses and charities. We are a UK charity but work all over the world, supported by a financial endowment.

To find out more visit www.nesta.org.uk

Experimental Culture

A horizon scan commissioned by Arts Council England

March 2018

Introduction	4
Executive summary and scope	6
1 Audiences and participation	11
Context	12
Horizon to 2030	17
2 Workforce and skills	20
Context	21
Horizon to 2030	26
3 The changing funding environment and business models	30
Context	31
Horizon to 2030	33
4 New technologies	37
Context	38
Horizon to 2030	43
Conclusion: Charting a course to 2030	47
1. Experimentation	49
2. Leveraging data	50
3. Shaping and sustaining partnerships	51
4. Reaching wider audiences	53
Appendix 1: Methodology	54
Endnotes	55

Introduction

Even in stable times, predictions are a perilous business. It's inherently hard to distinguish between major disruptions and minor disturbances on the horizon. There is reason to be especially cautious in the case of arts and cultural organisations, where to date the overall picture has been characterised by continuity with the past, and the sector has seen nothing comparable to the digital revolutions that have played out in retail, travel or other parts of the creative industries.

In the main, business models have not been upended, and technologies have not led to a seismic change in the relationship with audiences. Many of today's major institutions were around decades ago, operate out of the same or similar buildings and with a recognisable mix of activities. Predictions that live performance would be displaced by digital and that millions would make a living thanks to the 'long tail', as platforms like YouTube made it possible for producers to find niche audiences, have not yet materialised.

Look closer, however, and this stability belies uncertainty and churn beneath the surface. Over the course of the coming decade, much of this change will flow from external drivers and technological progress – such as the UK's exit from the EU, an ageing population, the impact of automation on work, the expansion in the capabilities of artificial intelligence and the growth of other emerging technologies such as Virtual and Augmented Reality. The implications of these developments extend far beyond the arts and cultural sector of course, but they will help to define the contours of the wider landscape for arts and cultural organisations, their workforce and their audiences.

For arts and cultural organisations receiving public funding, among the most significant projections about the next decade is that of continued pressure on public spending in the UK. Rising health and social care costs, in conjunction with economic uncertainty over the coming years, will mean that public investment in arts and culture is likely to come under greater scrutiny (even in the event of a change in government such scrutiny is unlikely to diminish). This could set many changes in motion. Firstly, in responding to the risk of declining public funding, many arts and cultural organisations may find themselves needing to rethink fundamental elements of their business models, or as one of our interviewees put it:

"I think we have to really, really get our act together as cultural organisations and take the notion of sustainability much, much more seriously than we have over really the last 100 years."

Chris Michaels, National Gallery

Secondly, the sector may need to further sharpen its focus on demonstrating who benefits from arts and culture in receipt of taxpayer support. Currently, the UK's high levels of economic inequality and low social mobility are reflected in the polarisation of audiences for art and culture in the UK – meaning that the most privileged are often (although not always) more likely to access the benefits of public spending on the arts. Looking ahead, given indications of a decline in the cultural education offer in England's schools, the sector may find it even harder to maintain a broad reach to young people – with implications for the tastes and appetites of future audiences.

However, this challenging context also presents a unique opportunity for arts and cultural organisations to reframe their role and renew their sense of purpose, moving beyond the limits of a reductive debate which pitches 'intrinsic' value against 'instrumental' impact. An integrated vision can confidently assert the complementarity between the goals of arts and culture organisations and broader social and economic objectives. As one of our interviewees, Professor Jonothan Neelands of the University of Warwick observed, there is now a growing acceptance that these aims can form part of a single, holistic agenda:

"I'm old enough to remember when issues around diversity and participation in the arts and society were seen as social justice objectives. But they are economic objectives now as well; we know that diversity is the social engine of creativity. We recognise that creativity, the creative industries are absolutely essential to our social and economic futures. So I think for the first time there is a congruence across economic, social, cultural, artistic, digital, creative agendas that we've never seen before."

Given the central role the arts have always played in human progress, linking artistic, economic and social goals in this way is far from revolutionary. It is an argument fit for the 21st century, when the contribution made by arts and cultural organisations to developing creative skills becomes ever more critical to our success in the age of artificial intelligence and automation. Meanwhile, at the level of local communities, the longstanding role played by arts and cultural organisation in building social capital will become even more indispensable as we start to accommodate the needs of an ageing population at higher risk of social isolation.

The purpose then, of this paper is not to predict the changes ahead but to highlight some of the key features of the context in which UK arts and cultural organisations will be operating. For those organisations in the sector able to successfully capitalise on opportunities to engage with new markets, audiences and channels, new possibilities will present themselves.

Given the vast diversity across the sector, there can be no single blueprint for responding to some of the changes and trends we discuss in this paper. We do, however, suggest some behaviours and practices likely to support organisations to respond proactively. This includes cultivating the capacity to be more **experimental** in harnessing new technologies and adopting new organisational practices, alongside leveraging the value of **data** in order to understand how best to engage audiences and test new business models. Central to **extending their reach to a wider audience** will be fostering a sophisticated array of **partnerships** – whether with universities, technology companies or with other institutions open to sharing resources and expertise.

In practice, it often takes time, resources (and sometimes scale) to explore the application of emerging technologies, connect with new audiences and broker local or international relationships. This is where public funding will serve an especially critical purpose over coming years, carving out the freedom for organisations to take risks and distributing the benefits throughout the ecosystem.

Executive summary and scope

Between December 2017 and February 2018, Nesta undertook a rapid horizon scan to support the development of Arts Council England's forthcoming ten-year strategy to 2030. This paper is intended to serve as a prompt for Arts Council England's consultation activity over the forthcoming months, with the intent of provoking a conversation with arts and cultural organisations about the changing context for their work.

The aim was to produce a primer on existing knowledge of key trends, not to conduct a comprehensive review. Within the timeframe available for this exercise, we primarily focused on domain areas in which Nesta has previously conducted research or run grant programmes. Consequently, this paper emphasises the impact of technology and opportunities for experimentation and innovation in the coming decade. Looking at broader trends through the prism of new technologies and innovation also serves as a useful means of locating early 'signals of change' likely to alter the operating environment in the coming decade (as opposed to focusing on practices or trends which perpetuate the status quo).

In extrapolating insights from these signals we aim to provoke discussion about possible futures as part of an ongoing dialogue within the sector, rather than presenting definitive conclusions. Each chapter includes a short summary of the current context for organisations operating in the (publicly-funded) arts and cultural sector, followed by a section which looks ahead to the opportunities and challenges these drivers could present over the coming decade.

Please see Appendix A, at the end of this report for a summary of the methodology and a list of expert interviewees who generously contributed to this rapid scan.

Section 1

Audiences and participation

- The UK faces a range of structural economic, social and geographic inequalities, and a persistent lack of social mobility. Mirroring this, audiences for arts and cultural activity are also polarised along socio-economic, demographic and geographic lines. For example, data from the Department for Digital, Culture, Media and Sport (DCMS's) *Taking Part Survey* and the Warwick Commission on the *Future of Cultural Value* both suggest there has been no substantive progress towards closing the gap in audience participation between different socio-economic groups across English society.
- To date, the promise of digital technology to democratise access and participation in the arts and cultural sector has not been fulfilled, although digital has driven greater disruption in adjacent creative industries. Meanwhile, universal access to cultural education, which could act as a leveller in terms of introducing young people to arts and culture – both as audiences and participants – has been affected in England by a decline of 15 per cent in teaching time between 2010-2015.

- There are also several demographic changes that will impact on arts and cultural organisations over the coming decade. For example, the growth of an ageing population with disposable income, leisure time and an appetite for culture could constitute an opportunity for the arts sector. Millennials will represent an increasingly important cohort of consumers within the UK. As a fully 'digitally immersed' generation they are arguably more likely to expect novelty, choice and personalisation from cultural experiences.
- The growth in 'everyday creativity', and in particular voluntary participatory arts, digital activity amongst the young and the rediscovery of craft and making may create opportunities for arts and cultural organisations to meet audiences and participants on their own terms. Both within this context, and in terms of wider audience development, there remains a continued strong appetite from the public for live engagement, with technology providing complementary, not substitute, experiences.

Section 2

Workforce and skills

- The UK's arts and cultural sectors have experienced uneven employment growth over the period 2011-2016 with employment in music, visual and performing arts growing at 36.6 per cent, while employment in museums, galleries and libraries grew at the slower rate of 1.8 per cent. Meanwhile, employment in the broader creative industries has grown at 25.4 per cent, over three times faster than the UK workforce.
- The arts and cultural sector is characterised by a high proportion of freelancers. The ethnic diversity of the workforce varies across museums and cultural institutions, but is not reflective of the wider population; the gender balance is on average healthier, but there are persistent challenges in relation to diversity more generally in leadership roles.
- Skills shortages exist in relation to creative sectors like animation, visual effects and video games. A range of specialist conservation skills are in short supply in museums, and there are shortages related to specialist technical roles in theatres. Digital skills remain a systemic problem throughout the sector.
- Brexit presents additional uncertainties with regard to the supply of skills and talent. While the evidence is that arts and cultural organisations employ proportionately fewer EU migrants than firms in the whole economy, in specific areas such as freelance performers, or those with certain design, craft or digital skills their role is particularly important. Accessing these workers at short notice in future when there are domestic shortages may be particularly problematic.
- Automation will impact the whole labour force over the next decade. However, creative roles are particularly resistant to automation, with Nesta's research suggesting 87 per cent of creative occupations are at low risk of this happening.
- Looking at a broader set of technological, social and economic changes, our analysis points to cultural and media occupations growing in importance in the workforce. The research suggests that, more generally, roles combining high-end cognitive skills, such as originality, active learning and systems thinking, with strong social and communication skills - the hallmarks of creative work - will experience a rise in demand.
- Over the long term, further reductions in access to cultural education in England and factors impacting funding for creative subjects in Higher Education, could adversely affect the UK's competitive advantage with regards to availability of creative talent and the health of the creative industries more broadly.

Section 3

The changing funding environment and business models

- The market for arts and culture content is likely to become ever more global, expanding the potential audience for UK arts and cultural organisations. At the same time, increasing adoption of digital technologies will be a way for more organisations to reach this larger audience.
- However, the UK's arts and cultural sector is also likely to face more competition, both from other domestic leisure activities and from international organisations. There are also reasons to be cautious about the future public funding outlook at both central and local government levels, due the UK's ongoing fiscal indebtedness, Brexit-related economic uncertainties and forecasts of only slight rises in National Lottery expenditure.
- Many arts and cultural organisations will need to look for more ways of shifting their balance of funding towards other sources, such as private sponsorship and philanthropic giving. New routes to finance, such as impact investment and crowdfunding, which have emerged in recent years will become a much more significant part of the funding mix for some types of organisation. Micropayments and donation based patronage enabled through online platforms are also likely to be of interest to some artists, performers and organisations.
- Digital distribution could also present commercial opportunities for arts and cultural organisations over the coming decade (for example licensing live-to-digital broadcasts, and the creation of virtual reality content).
- Data capture enabled by digital technologies could allow institutions to optimise their commercial model in other ways - for example, 'dynamic ticket pricing' where ticket prices can be varied over time according to the demand levels.
- However, there is a risk that some arts and cultural organisations (particularly smaller ones) may not have access to the technical, data and business skills that are needed to respond to the commercial opportunities of this environment.

Section 4

New technologies

- The last decade might have seen a new dawn for the integration of digital technologies into the work of arts and cultural organisations. Yet, in the main, such a revolution has yet to materialise, as many organisations encounter barriers to experimentation (such as lack of access to funding and constraints on staff time).
- The digitisation of collections and artefacts has become standard practice for many cultural institutions, but the use cases for capitalising on these digital assets, has been limited to date.
- There have, however, been some significant technological developments in creative practice as interdisciplinary collaborations between musicians, artists, performers and technologists have generated artworks spanning multiple media and challenging conventional art form definitions.
- Looking ahead to the coming decade, there are set to be a number of technological advances with significant implications for the arts and cultural sector. In particular, Virtual Reality, Augmented Reality and so-called 'Mixed Reality' will see significant growth. Cultural and artistic content will be one of the drivers of these technologies

becoming more widespread in society more generally. Virtual galleries and other immersive performances could be another means of engaging audiences across dispersed geographies and could open up new sources of revenue for organisations.

- Arts and cultural organisations could also seek to capitalise on acceleration in the fields of artificial intelligence (AI) and machine learning in order to deliver efficiencies, innovate and extract value from the vast stores of data they hold. AI is also becoming part of the creative toolkit, with more artists and performers now 'collaborating' with AIs.
- However, exploiting these technologies often means entering into new partnerships, particularly with technology companies bringing specialist knowledge and tools. Arts and cultural organisations will need to understand how these relationships can be structured to serve their needs over the long term, and maximise the wider public value they create. All organisations stand to benefit from sector-wide learning on 'what works' from such partnerships and ongoing experimentation.

Conclusion: Charting a course to 2030

In addition to engaging with overarching questions around inclusiveness and their role in creating public value, arts and cultural organisations will also have to contend with the ripple effects of a complex set of technological, demographic and socio-economic trends. If they are to prove robust in response to the uncertainties which flow from these trends, many will find it valuable to build capacity in the following areas:

1. Experimentation

- Arts and cultural organisations, and the individuals that work in and around them, are renowned for producing bold and often groundbreaking work. Yet, despite this, there remains a consistent sense that the sector is slower than more commercial sectors (like music and video games) to harness new technologies, exploit the assets they hold in a more joined-up manner (both physical and digital) and bring new methods and practices into their work from other fields.
- Cultivating a culture of experimentation within organisations - from opportunistic and small-scale testing to the larger and more structured experiments - should be a key priority. It will also be important to ensure that there is an infrastructure for shared learning in the arts and cultural sector, similar to that which exists in science and technology research and development (R&D).

2. Leveraging data

- Growing a more systematic and widespread culture of experimentation in the arts and culture sector will be partially dependent on a more systematic and rigorous approach to capturing and analysing data. More widespread data capabilities will help cultural institutions to optimise business processes, better understand their existing audience, reach new audiences and unlock the value of their cultural assets.
- Looking beyond the value of using data to inform decision-making in individual institutions, marshalling more robust evidence will also help to better capture the public value created by the sector as a whole.
- However, leveraging the value of data will require specialised skills and knowledge, and there is some way to go for the sector in terms of developing the necessary skills and capabilities.

3. Shaping and sustaining partnerships

- Over the coming decade, arts and cultural organisations will be looking to grow partnerships which allow them to reach new audiences, access specialist skills, tap into new sources of revenue and experiment with technology. Partnerships that allow for more efficient operations through shared services, facilities and procurement are also likely to become more important.
- The emphasis on local partnerships is set to become even more pronounced in funding and policy, building on a longer-term trend towards place-based strategies in both arts and cultural policy and the wider creative industries.

4. Reaching wider audiences

- Concern about inequitable patterns in access to arts and cultural experiences reflecting (or even reinforcing) existing inequalities, means that work to broaden, diversify and deepen relationships with audiences will be critical in sustaining support for public spending on the arts in future.
- Organisations can extend reach in a variety of ways - some may look to foster deeper relationships with their local community, whereas others could use technologies to engage an audience distributed across different locations.
- Despite the uncertainty on the horizon, it should be noted that many arts and cultural organisations have already successfully weathered decades, in some cases centuries, of social and economic change by reimagining and renewing their relationship with audiences. This creativity will be vital in sustaining their relevance in future.

1 Audiences and participation

Drivers



Socio-economic context:

Persistent inequality and low social mobility in the UK

Policy drivers:

A decline in cultural education in England

Explosion in digital consumption and production of culture:

18-24 year olds now spend 35 hours a week online, but the appetite for live events and collective experiences remains strong

Demographic shifts:

Millennials move into early middle age over the next decade and begin to inherit wealth from older generations

The rise of the ageing population set to drive

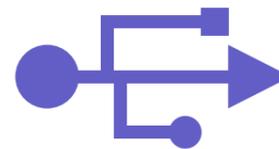
51%

of consumption growth in Europe between 2015-2030

15%

reduction in teaching hours for the arts in England between 2010-2015

Implications



Continued polarisation of audiences for the arts

17%

 gap in attendance between the highest and lowest socio-economic groups

Reach to young people weakened:

Through reduction in cultural education, with much cultural creation and consumption falling outside the boundaries of publicly-funded arts and culture

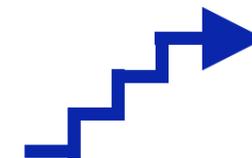
Increased competition

For the attention of audiences seeking novelty and personalised experiences



Increased importance of capturing health, wellbeing and social benefits of participation - especially for older people

Opportunities



The offer to audiences:

- Catering to appetites and needs of ageing audiences
- Novel programming which taps into the experience economy



The benefits to audiences:

Using evidence of impact to unlock new sources of finance from public service commissioners, philanthropists and social impact investors

Reaching new audiences:

Using digital platforms and aggregators to connect with geographically dispersed audiences



1

Audiences and participation

Context

Audiences for arts and culture are currently polarised

The UK's society is partly characterised by high levels of social and economic inequality. The Social Mobility Commission noted in 2017 that 'for young people it seems that the link between demography and destiny is becoming stronger rather than weaker' and that only one in six workers in low paid jobs in 2006 were able to move out of this classification ten years on.¹ Income inequalities are reflected in the UK's geography too: for example, the Institute for Fiscal Studies reports that 25 per cent of poor children live in the 10 per cent most deprived local authorities.² Few expect the UK will turn around its record on inequality over the next ten years - and we can expect it to be a feature of the context in which arts and cultural organisations operate for the foreseeable future.

This pattern of social and economic polarisation is also evident in English audiences for arts and culture. The DCMS's *Taking Part* survey shows that while participation in the arts has remained relatively static over the previous ten years, it is significantly higher for people from the upper socio-economic group (84.4 per cent in 2016-2017) than the lower socio-economic group (67.4 per cent in 2016-2017). This gap has narrowed by only 2.9 percentage points in the last ten years. Similarly for museum and gallery attendance, there is a 26.5 percentage point gap between those from upper and lower socio-economic groups.³ There are also wide disparities in arts and cultural engagement by geographical location, reflected in Arts Council England's commitment to funding activity in a number of areas of low engagement.⁴

The Warwick Commission highlighted the unequal engagement for arts and culture in stark terms: the wealthiest 8 per cent of the population supplies 28 per cent of all attendees to theatre and 44 per cent of live music attendees in England, despite significant supply-side interventions to increase audience diversity. Overall then, audiences for publicly-funded culture are therefore not representative of the population, but skew towards the most privileged. According to the Warwick Commission this does not necessarily demonstrate a lack of engagement with culture from those outside the high socio-economic groups, so much as the idea that "*low engagement is more the effect of a mismatch between the public's taste and the publicly-funded cultural offer*".⁵

This poses significant questions about the continued future reach and relevance of publicly-funded art and culture, and the organisations that deliver it. In an interview with us Pauline Tambling, former Chief Executive of Creative & Cultural Skills, argues:

"What has happened is that the demographic that engages with the arts has got more narrow, more entrenched. I think that for young people who are not in urban centres, not middle class and who are not white it's getting harder and harder for them to engage as audiences or employees. And the problem with that is not only who engages, it's how the arts look and how credible it is for the arts to receive public funding."

The decline in cultural education in England represents a challenge for developing future audiences

“Young people are not necessarily encountering arts and culture and seeing the potential for them personally at younger ages within the education system, and if they don't get it in the education system, where are they going to get it? So, I think that's a big issue.”

Deborah Bull, King's College London

Cultural education and participation in schools is one of the main routes by which young people come to engage with the arts and culture. If made available to all, it can help to bridge polarisation between audiences. Evidence of the marginalisation of traditional arts subjects within the national curriculum in England's schools is of major concern here (despite some debate on how the take-up of arts subjects is measured). The average number of arts subjects taken at Key Stage 4 (GCSE level) is the lowest in a decade,⁶ and has dropped from 0.80 to 0.70 from 2013-2016, with initial data from 2017 indicating a further decline.⁷ The Cultural Learning Alliance also points to figures that show that between 2010 and 2015 the number of teaching hours in English schools committed to teaching arts subjects has dropped by 15 per cent.⁸

Taken together, the reduction in the teaching of arts subjects and low engagement of certain socio-economic groups with the arts (as evidenced in the Warwick Commission's findings) will likely impede the efforts of arts and cultural organisations to reach a broader audience, the implication being that practitioners will have to work even harder to engage a broad constituency in their work.

Digital technology has not yet transformed access to arts and culture

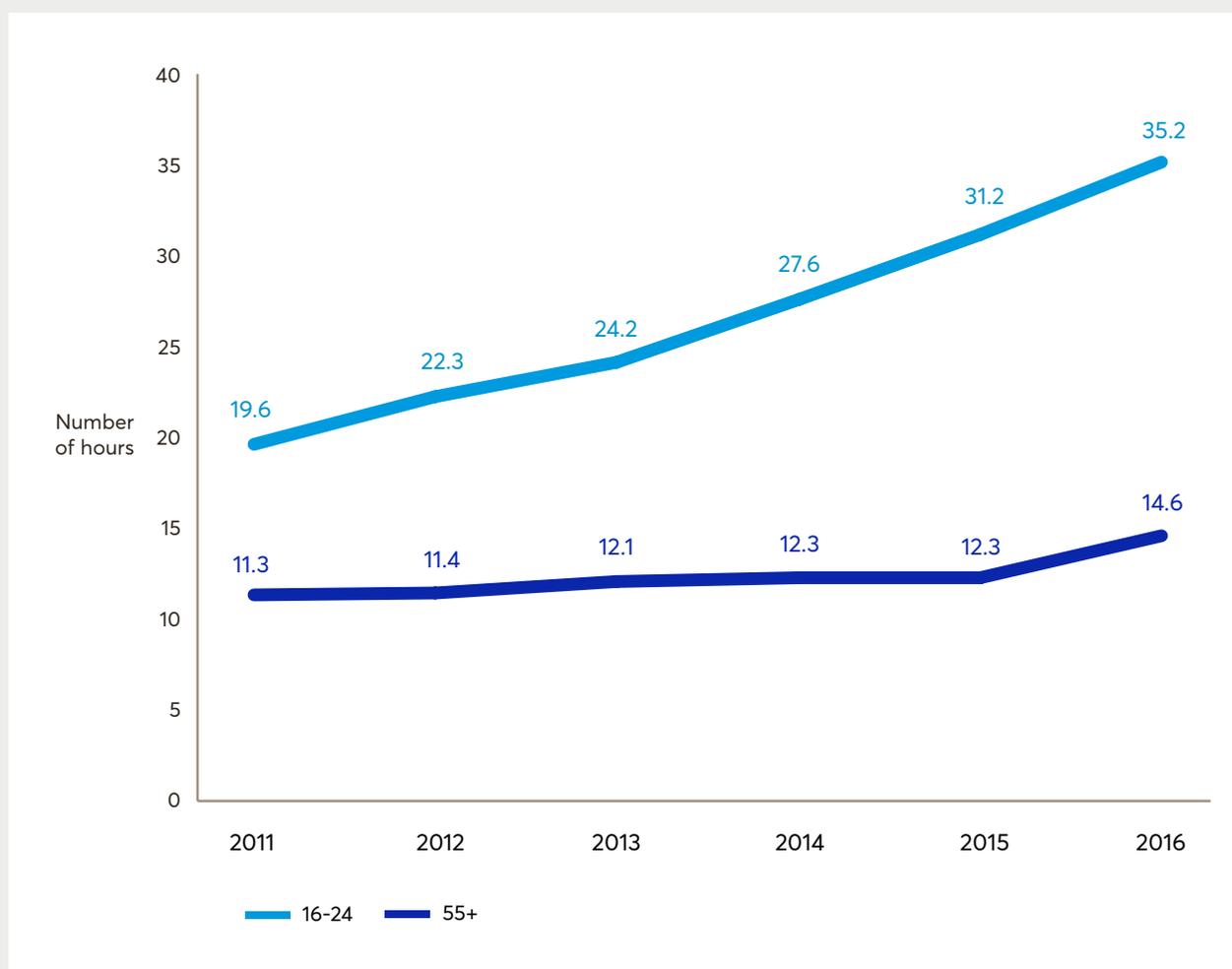
Digital technologies, with their potential to lower the costs of production and enhance access to the arts and culture across a range of channels, have been championed as a means of democratising the supply and demand for arts and culture. In parallel fields, such as music, video games, television and film, digital disruption has led to wholesale changes in audience behaviours. However, arts and cultural organisations - in the main, still rooted in physical venues, artefacts or in-person performances - have been largely immune to these shocks. Arts Council England and Nesta's Digital Culture survey has shown that the positive impact of digital on different aspects of audience experience has grown over the last five years, but this has resulted in incremental rather than transformational change across the breadth of activities organisations undertake.

This absence of disruption has had both positive and negative implications. On the one hand, business models have remained stable, and there are a number examples of arts and cultural organisations growing their audiences online and effectively using digital

distribution channels. However, arts and cultural organisations are not keeping pace with the expectations and appetites of an increasingly digital-first public. In an example of audience reach on YouTube for example, three 'gatekeeper' channels to the UK's surging Grime Music scene on YouTube (SB.TV, Link Up TV and GRM Daily) have a combined subscriber base of two million people.⁹

In this context, it is worth noting that the UK's 18-24 age group already spends an average of 35.2 hours a week online, compared with 14.6 hours for those aged 55 and above.¹⁰ There seems little doubt that organisations will need to step up their engagement with technology, or risk, over time, alienating those segments of their audience more accustomed to a certain standard of digital engagement.

Figure 1: Amount of hours spent online by age group per week



Source: Ofcom (2017) *Adults media use and attitudes*

Participation in culture is healthy across the UK, although it may not be 'culture' as traditionally defined

Despite the evidence on unequal access to arts and culture, many young people are in fact actively engaged in both cultural creation and consumption, though this often falls outside the boundaries of publicly-funded arts and culture. The popularity among this demographic of creative expression on social media, for example, is manifested in the rise of Instagram poetry, YouTube vlogging and video game live streaming platforms such as Twitch. Engagement with culture in different settings and on alternative platforms have challenged conventional categorisations, as Paul Roberts, Chair, Innovation Unit, noted in an interview:

"The other aspect of this is whether we are creating problems for ourselves by a rather narrow definition of what is engagement with the arts and culture. What I'm thinking about here is there is a significant degree of engagement, but it's taking place by alternative means, alternative venues or alternative organisations. Young people are engaging in a whole range of artistic and cultural activity, which is as it were off the formal radar."

Of course, everyday creativity is not confined to digital platforms or to the activities of young people. The Voluntary Arts Network estimates that there are approximately 63,000 voluntary arts groups operating in the UK and Northern Ireland, with some ten million people actively involved in creative activities.¹¹ A report for Arts Council England by 64 Million Artists points to the potential schism between this mass of participation and the work of funded organisations:

"Overwhelmingly we have heard that language, attitudes and the prevailing 'excellence' narrative in the arts can be seen as divisive in terms of engaging a broader audience in arts and culture."¹²

64 Million Artists

How to reconcile the focus on backing art of the highest quality, at the same time as encouraging mass participation and creative production, is a pressing question for arts and cultural organisations. David Jubb, Artistic Director and CEO of Battersea Arts Centre, argues for a shift in the model, from 'arts and participation' to 'co-creation' with communities, giving rise to "...cultural centres [that] better reflect the society in which we live. They will engage more meaningfully with a wider range of people and play their part in bringing together more mixed communities, in shared, creative experiences."¹³

An ageing population presents both challenges and opportunities for the arts and culture sector

One of the more predictable trends arts and cultural organisations will need to engage with over the next decade is the shift towards an ageing population. In particular, the average age is increasing, with projections suggesting that 22 per cent of the population will be aged 65 and over by 2030, up from 18 per cent today.¹⁴

There are two obvious implications for the arts and culture of this demographic shift. Firstly, there are questions related to the way in which the sector could specifically cater for the ageing population as a growing constituency. Currently, engagement with culture is lower for those over 75 years old: in England, 78.6 per cent of those aged 65-74 engaged

with the arts in the last 12 months, compared with 62.2 per cent for those aged 75 and over.¹⁵ However, the McKinsey Global Institute estimates that the retiring and elderly within developed nations will account for 51 per cent of urban consumption growth between 2015-2030, with people living longer and with potentially increased leisure time and disposable income.¹⁶ This presents an opportunity for arts and cultural organisations to develop offers which appeal to an audience with considerable market power.

The second implication relates to capturing and articulating the value of cultural participation to this group. Arts and cultural organisations can play a role in mitigating the effects of some of the problems associated with ageing (such as long-term health conditions and social isolation). In considering the individual indicators that give a sense of wellbeing in later life, the charity Age UK found that participation in creative and cultural activities provided the largest individual contribution to wellbeing, followed by 'physical activities' and 'thinking skills'.¹⁷ The emergence, and possible growth, of new (and existing) organisations focused on embedding creative arts in a health or social care context to improve health and wellbeing outcomes for older people may become increasingly prominent.

Millennials will become an increasing force driving audience change across arts and culture

Millennials - those born in the early 1980s to 2000 - make up 23 per cent of the UK population. This group will move into early middle age over the next decade and have a number of unique characteristics that will become important for arts and cultural organisations to consider. Millennials are currently less well-off than previous generations, due to low wage growth and a lack of disposable income. However, this may start to change towards the end of the 2020s as this group begins to inherit wealth from the generations ahead of them.¹⁸

There are two points to consider as the millennial cohort moves into the role of primary consumers within the UK. Firstly, this is the first fully digitally immersed generation. The polling company Ipsos MORI outlines some of the implications of the millennial use of technology: *"Although not possible to prove, many other aspects of millennial life will partly flow from this [technology use] – openness, diversity of choice, but also their lack of trust in others."*¹⁹ The diversity of choice engendered by technology is therefore an important consideration for arts organisations thinking about what they offer to this generation, and Generation Z behind them.

The second point relates to the millennials desire for novelty and personalisation. Nesta's work with Pearson to examine future trends outlines that millennials have a *"heightened expectation of immediacy, participation and transparency"*.²⁰ These shifts are likely to be maintained, rather than fade away, as the group moves towards middle age. James Murphy, Managing Director of Southbank Sinfonia, acknowledges the implications of this point for the arts and cultural sector saying:

"People want a real experience when they go out for something cultural nowadays. We see that particularly with millennials, so it's really important in all arts, particularly classical music, for us to address that. We need to keep pace with that kind of appetite and imagination, whilst ensuring attendees can still connect on a fulfilling artistic level with the music itself."

Horizon to 2030

Will audiences become more demanding of traditional forms of arts and culture, as their exposure to other forms of entertainment increases?

While it is indisputable that the arts and culture offer something unique to their audiences, there is also competition for their attention from other forms of entertainment. To be able to compete, organisations may need to become more dynamic and novel in their programming. We see many examples of this already, from the gamification of artistic experiences, to the popularity of museum cafes (particularly with a younger demographic), to combinations of both 'high and 'low' art forms in single productions, or the use of non-traditional locations.²¹

Digital technologies also raise audience expectations, as we see the relationship between institution and audience evolve from one which is broadly one-directional to a more multifaceted, non-linear engagement. Audiences now expect to engage with arts organisations in a number of different ways, possibly before ever encountering them in a physical setting. This includes engagement through multiple social media channels and online mediators (such as news outlets). This is a profound shift, and requires organisations to think about the representation of their offer to the public in different ways.

"There's an assumption that digital technology automatically makes engagement easy, but in some ways it makes it harder. There are so many routes to market, distribution platforms and brands – in short, competition - that unless you're at the vanguard of innovation you can end up losing more audiences than you acquire."

Jonty Claypole, BBC

"I think there's a huge opportunity [to] catch up with the retail sector, with TV on Netflix and Amazon. The business models that they have implemented are based on the use of data. We're much further behind in terms of understanding audiences and being able to market to them."

Anna Lowe, Smartify

While audience expectations may change over the next ten years, there is little evidence that the desire for collective experiences of culture will wane. Indeed, in the music industry the growth in streaming can be seen alongside the boom in festivals and live events. The number of attendees to live music grew by 12 per cent from 2015 to 2016 to a total audience of 30.9 million. This has taken place alongside the growth of streaming services, with the BPI showing that music consumption grew by 9.5 per cent between 2016 and 2017, largely driven by a 51 per cent increase in streaming.²²

How can the arts best use platforms and aggregators to build their audiences, both locally and globally?

In an era in which digital consumption of cultural content is ever-increasing, arts and cultural organisations will have to navigate how platforms and aggregators help them reach audiences. Mainstream video platforms like YouTube, and niche arts platforms like NOWNESS and Marquee provide access to potentially large audiences, but how will the commercial value thereby created be divided between the platforms and the arts organisations? How can arts and cultural organisations optimise their relationship with the platforms for the next generation of technologies, like VR or AR? What new forms of partnership and collaborations will best serve the needs of the sector?

"I think a big challenge there is how platforms can exploit emerging creators as they try to get off the ground, develop an audience and sustain a practice. They can extract a lot of value from this system and funnel that money primarily to investors and shareholders while prioritising big creators on their platform."

Jon Leland, Kickstarter

Will the arts be able to capitalise on demographic shifts to an ageing audience?

A major area of focus for arts and cultural organisations will be around how they can effectively engage an ageing population - and one which, at least for the next decade, will have a far greater proportion of leisure time to invest in cultural attractions and participation.²³ Technology has real potential here too, particularly for those that cannot easily travel. Audiences for NT Live currently skew towards older age groups - but technologically this is just the beginning for what digital could do for audiences with mobility issues or other access requirements. Haptic technologies, Virtual Reality and Augmented Reality have real potential to deliver artistic and cultural content in new ways to these groups.

Will capturing wider benefits of cultural participation become increasingly important in the coming decade?

"Everyone who works in the arts believes in intrinsic as well as instrumental value, but it generally comes low down in any list of arguments for public funding."

Jonty Claypole, BBC

Arts and cultural organisations have, over the years, been asked to demonstrate value through both the quality and intrinsic value of their output, and their impact on the lives of audiences and participants - including measures of health, wellbeing, social cohesion and economic impact. Over the next ten-year horizon, we anticipate that developing an evidence-based account of the holistic impacts of the arts and culture will become even more important. In an interview for this scan, Tim Joss, Chief Executive and Founder of Aesop, made the case that arts and cultural organisations need to overcome their anxieties when it comes to capturing wider benefits:

"There are still lots of people in the arts world who are worried about being instrumentalised... that if they start working with health their own artistic practice will not be respected, the ideas of artistic quality will go out the window and they will just be used as a resource for delivering health improvement. I don't see it like that. What the arts world can contribute is wonderful, extraordinary. At the same time, it can deliver on serious health improvement and... offers artists scope to develop their artistic practice. And working alongside health professionals can be empowering."

We can, therefore, expect that evidenced-based work of this kind will become increasingly important to a wider range of stakeholders in future. These may include public service commissioners, philanthropists and social impact investors who will potentially help to unlock new sources of finance in the process.

2 Workforce and skills

Drivers



Automation

87%

of jobs in UK creative occupations will be at low or no risk of future automation over the next ten or so years, compared with

43%

in the workforce as a whole



Brexit

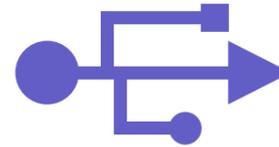
Risk of reduction in access to the EU workers needed to meet any domestic skills shortages in arts and cultural organisations

Some of the UK's best-known orchestras now have over

20%

of musicians from other EU countries

Implications



Buoyant prospects for creative occupations:

Projected future growth over the next ten years for curators and archivists, entertainers and performers -amongst others



Persistent deficits in the digital skills of the sector

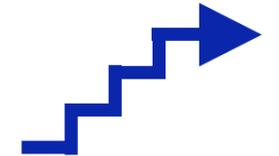
55%

of organisations say they only hold basic skills in relation to digital business models

Pressures on the skills pipeline ahead?

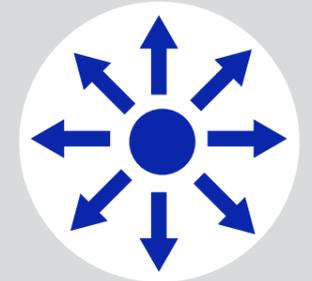
De-prioritisation of funding for creative subjects in Higher Education combined with reduced access to cultural education in England

Opportunities



Diversification

of the workforce in order to expand supply of talent in the future. Use of sophisticated data analytics to track diversity measures



New approaches to supporting self-employed workers in a more precarious labour market:

For example creative hubs to strengthen access to networks

The proportion of the arts and cultural workforce which is freelance or self-employed is

47.6%

compared to only

16.6%

of the workforce as a whole

2

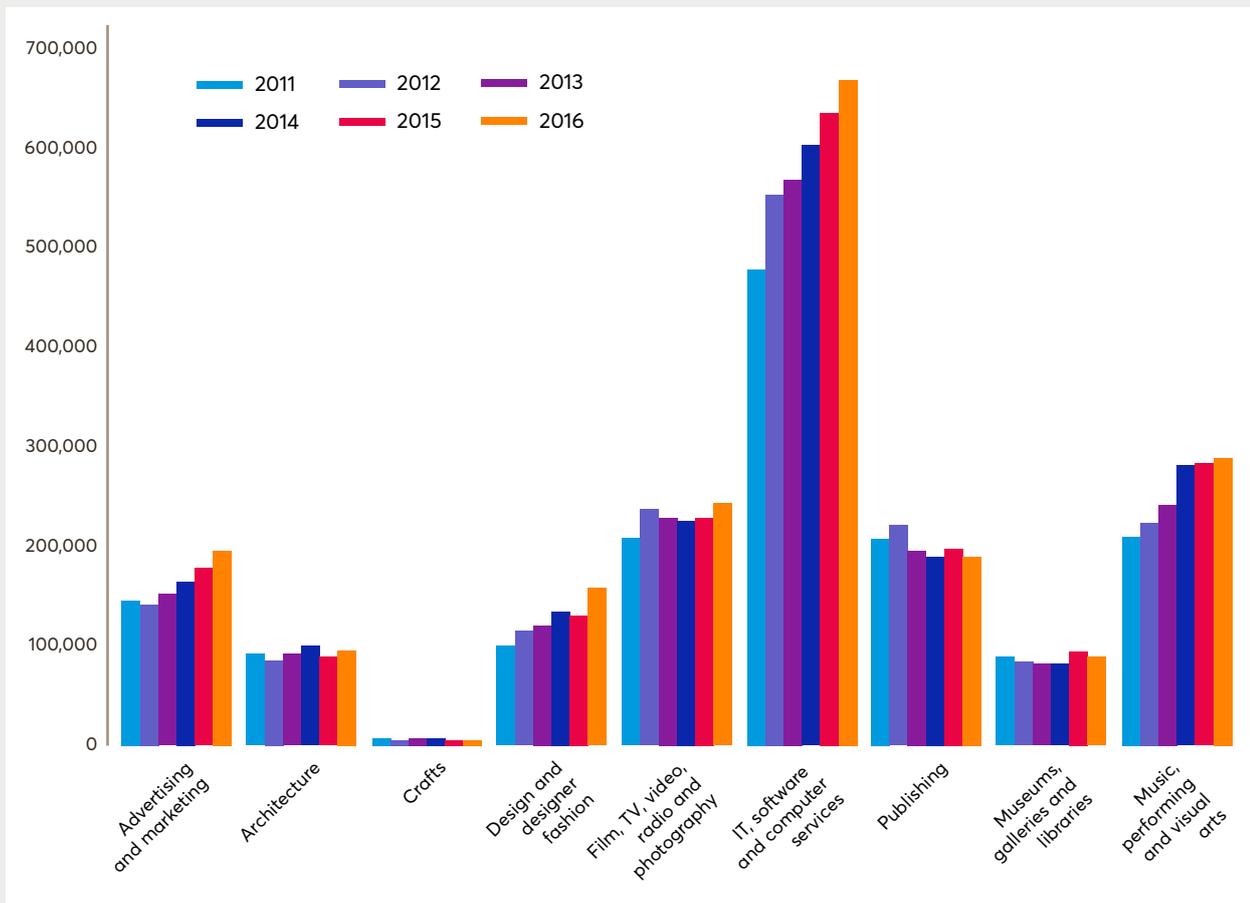
Workforce and skills

Context

Trends in the workforce

There has been growth in the numbers of those employed in the arts and cultural sectors, but this growth has not been evenly spread.²⁴ Between 2016-2011, employment in music, visual and performing arts grew by 36.6 per cent, however employment in museums, galleries and libraries grew at the slower rate of 1.8 per cent. Meanwhile, in the wider creative industries advertising and marketing grew by 33.3 per cent and film, TV, video, radio and photography by 16.6 per cent over the same period.²⁵

Figure 2: Number employed in creative industries sector



Source: Chart based on data from DCMS (2017) DCMS Sectors Economics Estimates.

Employment in music, visual and performing arts is at 291,000 people, around three times the employment in museums, galleries and libraries, which employ 92,000 people. The wider creative industries as a whole continue to be among the fastest growing sectors in the UK economy.²⁶ Employment has increased by more than 25 per cent in the last five years, almost three times faster than the UK workforce.²⁷

The UK's creative industries have a high proportion of small companies, with 89 per cent of businesses employing fewer than five people, compared with 78 per cent in the economy as a whole.²⁸ More than a third of the workforce is made up of freelancers or the self-employed, compared with only a sixth of the UK workforce as a whole.²⁹ Within the arts and cultural sector, the proportion is even higher at 47.6 per cent.³⁰

The arts and cultural sector is characterised by persistently low levels of diversity in the workforce

In recent years there has been renewed resolve to tackle longstanding concerns about insufficient diversity in the arts and cultural sector. This is a complex and multifaceted problem: culture, broadly defined, can mark divisions between groups of people and can serve, even if unconsciously, to reinforce social inequalities.

Arts Council England's 2018 diversity report finds that 4 per cent of staff among its Major Partner Museums (MPMs) are from black or ethnic minority backgrounds and the figure is 11 per cent of staff among National Portfolio Organisations (NPOs).³¹ By contrast this group constitutes 16 per cent of the working age population as a whole.³² Aggregate statistics can cloud even greater discrepancies: in areas like the performing and visual arts, where the workforce concentrates in urban areas, and in the South of England in particular,³³ the levels of creative workforce diversity might plausibly be even less reflective of the wider workforce. The gender balance in MPMs and NPOs is much more even at 51 per cent and 46 per cent of all staff respectively, although this masks the fact that this balance is not always reflected at senior levels.³⁴

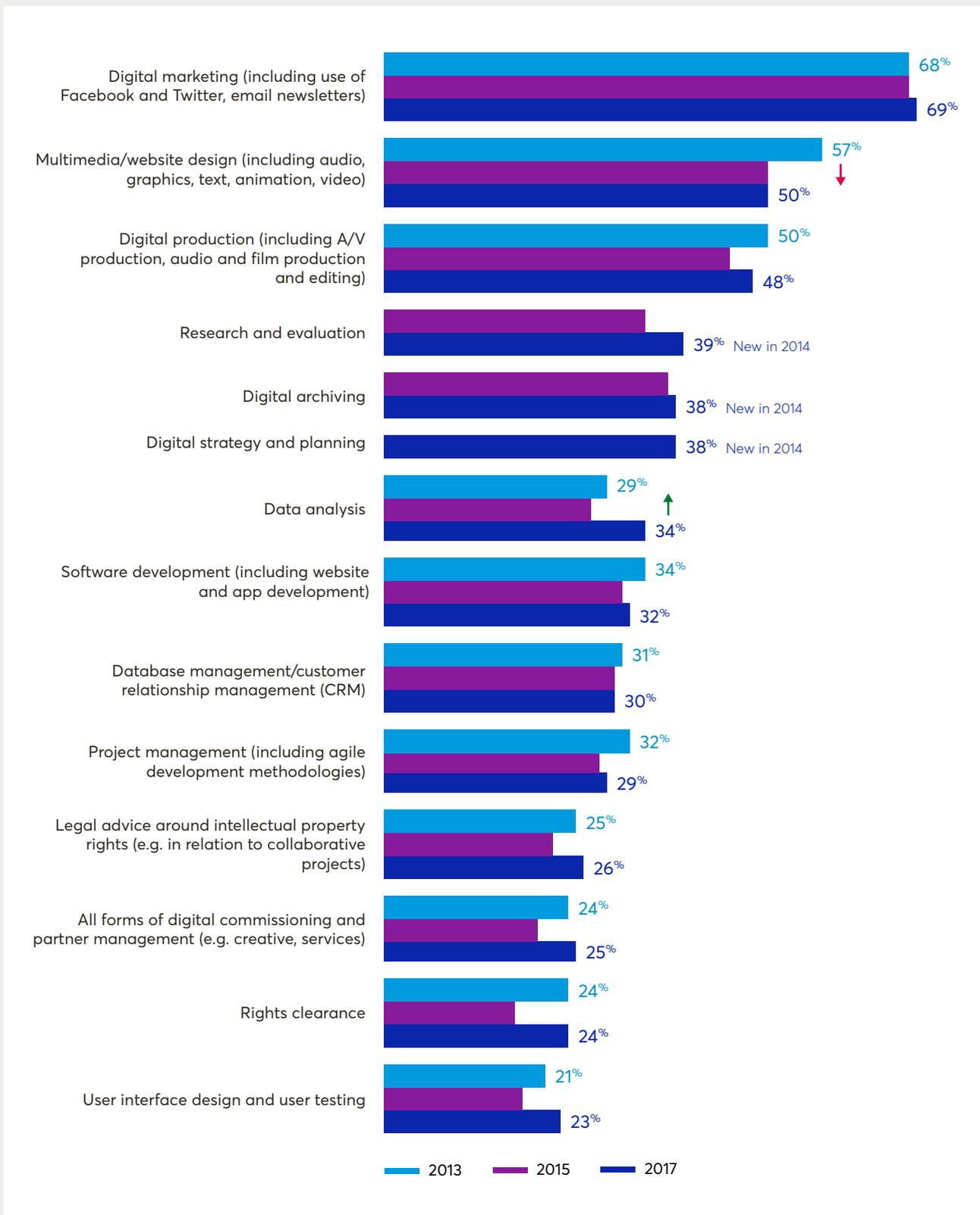
In response to these challenges, a number of diversity initiatives have been launched in recent years to address poor levels of diversity in arts and cultural organisations and the wider creative industries.³⁵ In addition, big data and ongoing advances in analytic techniques are starting to play a role in exposing gender and other imbalances in the film industry,³⁶ and in coming years we should expect to see rapid growth in equivalent efforts in the arts and culture sector.³⁷

Existing skills shortages and digital skills

There is growing evidence that employers in some parts of the UK's creative industries - such as animation, visual effects and video games - are facing skills shortages.³⁸ Likewise, there is evidence that museums and galleries³⁹ struggle to recruit talent with specialist skills in preservation and handling, and that theatres lack applicants for a number of essential backstage roles.⁴⁰

There is also evidence that arts and cultural organisations face skills deficits in relation to digital technologies in particular. While these are not new challenges, Arts Council England and Nesta's Digital Culture survey suggests there has been little progress in tackling them (or that the rate of technological change has outpaced the rate at which organisations have skilled up). In particular, in the five years since the Digital Culture survey was launched, there has been little change in the percentage of organisations that feel they are well-served for a range of digital skills.⁴¹ There are particularly acute challenges here, for example 55 per cent of organisations feel they only hold basic skills in relation to digital business models, an area very likely to grow in importance over the next decade.⁴² Without better systems of knowledge transfer and skills development across the sector, there is a real risk that the gap between early adopters and the majority of arts and cultural organisations will grow in this key area.

Figure 3: Proportion of organisations that report they are well-served for digital skills



Source: MTM (2017) 'Digital Culture 2017.' London: Nesta and Arts Council England.

Brexit creating uncertainty for arts and cultural organisations

Brexit presents further uncertainties for arts and cultural organisations and the creative workforce more generally. Figures from DCMS show that the cultural sector in fact employs a smaller proportion of EU workers (4.6 per cent) than UK employers as a whole (7 per cent), but as noted earlier, aggregate figures can hide significant variations. According to The Association of British Orchestras, the average percentage of EU nationals working in UK orchestras is 8.3 per cent, with some of our best known orchestras now having over 20 per cent of their musicians coming from other EU countries.⁴³ Analysis of the Annual Population Survey (APS) also suggests that non-EU workers are disproportionately important for museums, galleries and libraries.⁴⁴

EU workers might be expected to be particularly important to cultural institutions for a variety of reasons, ranging from the need for front-of-house staff with foreign language skills to international talent in the performing arts on either temporary or permanent bases to put on world-class shows.⁴⁵ As in other sectors, access to EU workers also helps UK arts and cultural organisations to fill jobs where there are domestic skills shortages. In an interview for this horizon scan, Pauline Tambling reflected on the fact that, to date, the UK sector has been able to rely on EU talent when it was necessary to 'skill up' rapidly, the absence of this source will necessitate long-term planning on the skills policy for the sector:

"Because of the EU we have been able to be a bit lazy and recruit as we've needed people... [there are a lot of event-based] jobs and people are coming to work in them from all over the world to fill them. That's going to be harder, I think, with Brexit. So, I do think that for a sector that grows by 'happenstance' and not by planning then inevitably it will be difficult to skill up and 'employ up' when you need people suddenly."

Creativity and the future of work

Cultural and creative work should benefit vastly from the digital revolution, as new technologies allow those in the business of expressing ideas to transmit these, at least in principle, to almost anywhere in the world. In addition, creativity - which according to the Oxford Dictionary is defined as *"the use of imagination or original ideas to create something"* - has the additional feature that it is less susceptible to future automation. Nesta research estimates that 87 per cent of jobs employed in UK creative occupations are at low or no risk of future automation over the next ten or so years, which compares with 43 per cent in the workforce as a whole.⁴⁶

Consistent with this finding, forward-looking assessments of employment trends which consider other forms of technological change, not just automation, and non-technological labour market drivers such as population ageing and the green economy, also point to buoyant prospects for creative occupations.⁴⁷ There is an emerging consensus that the future workforce will place a high premium on talent that combines advanced cognitive skills, such as originality, active learning and systems thinking, with strong social and communication skills - hallmarks of creative work.⁴⁸

Horizon to 2030

"The level of discussion and debate about seeing forward ten, 15 years is not very well developed..... there's a challenge both in terms of those who are providing the training, being confident about how they see what the most appropriate training needs are, added to which there is this opaqueness for young people and families about what those opportunities might be. But I think it should be one of the areas of really serious development over the next ten years."

Paul Roberts, Chair, Innovation Unit

What do studies of the future of work imply for the arts and cultural sector?

Nesta's research suggests that occupations such as Curators and Archivists, Entertainers and Performers and those in Media and Communications roles in the UK will experience future growth as a share of the workforce.⁴⁹

The research also suggests priorities for skills investment, from the viewpoint of further boosting demand prospects for individuals employed in these occupations. Specifically, these skills are in the following areas:

1. Cognitive skills and creativity

For Culture, Media and Sports occupations, the top three priorities for skills investment given are: Originality (the ability to come up with unusual or clever ideas about a given topic or situation, or to develop creative ways to solve a problem); Fluency of ideas (the ability to come up with a number of ideas about a topic), and Judgment and decision-making (considering the costs and benefits of potential actions to choose the most appropriate one).

In fact, these skills emerge as important priorities for skills investment in many other UK occupations too, consistent with the view that creativity will become more important across the whole workforce.

2. 'Social' skills

Like cognitive skills and creativity, the research predicts that social skills will, in the future, become more important for many jobs in the workforce. Priorities for skills investment for Culture, Media and Sports occupations specifically include knowledge of sales and marketing, of education and training and of sociology and anthropology (knowledge of group behaviour and dynamics, societal trends and influences) - all areas strongly related to social skill.

The growing importance of social skills can already be seen in both individual artistic practices and the ways in which cultural organisations are increasingly having to work. For example, groups such as Turner Prize-winning architecture collective Assemble are reviving and remodeling socially engaged practice, working with communities directly.⁵⁰

The need to cultivate relationships with a community over the long term requires that strong social skills be distributed through arts and cultural organisations doing this kind of work, as Mark Robinson of Thinking Practice notes:

"I think the arts sector needs to really build on what you might call civic skills, so those participation, engagement, education roles that probably have been decreasing in many organisations over the last 15 years. I think we're going to need those even more and they're not uniformly spread around I don't think."

This idea of co-creation with communities underpins Arts Council England-funded work under the Creative People and Places programme, where a variety of approaches have been developed between cultural producers and local communities with regards to shared decision-making in areas of low cultural engagement.⁵¹ As arts and cultural organisations seek to extend their reach to a more diverse set of audiences, the skill of its workforce in sustaining meaningful relationships will be critical.

How will the arts and cultural sector meet the needs of its freelancers in future?

There are sound economic reasons why the cultural sector has a high proportion of freelancers. For example, much work in the sector is project-based and great weight is placed on novelty and originality (which creates an incentive for organisations to draw on and recombine the talents of different people). The future demand for a creative output is also notoriously difficult to anticipate, which makes creative organisations more reluctant to take on workers as permanent staff.

However, these characteristics of creative work also give rise to under-investment in skills (why invest in the development of a collaborator who may not be involved in the next project?) and an inefficient diffusion of knowledge when it is not codified, which is detrimental to the sector.⁵² Several of our interviewees noted that the question of how best to meet the needs of freelancers in the workforce will require more thought over the coming decade:

"Increasing numbers... of people, not just artists, but including them, are freelance or portfolio workers.... you can see that in, say, the way that local authority cultural services have shrunk over the last ten years. They're drawing on consultants and freelancers in different ways to fill some of those gaps where they absolutely need to. And I think we need to find a different way of supporting - or.... enabling freelancers and portfolio workers to A: make a reasonable living, and B: train and keep their skills up to date."

Mark Robinson, Thinking Practice

In the case of the arts and cultural workforce specifically, this shift underscores the value of networks for those working in the field.⁵³ Models and flexible initiatives that strengthen these networks (and wider access to them), are thus likely to become increasingly important. One example of this idea in action is 'Creative Hubs', which have emerged partly in

response to the development needs of creatives (both practitioners and entrepreneurs) and their need to collaborate in both physical and virtual spaces. These networks operate by sharing resources, for example makerspaces (e.g. the Makersiversity in Somerset House, London), providing opportunities to reach new audiences through multipurpose hubs (e.g. Roco Creative Co-op in Sheffield), and strengthening local collaboration (e.g. the Creative Edinburgh virtual network).

The arts and cultural sector will not be alone in adjusting to the challenges presented by changing patterns of employment, as such trends mirror a broader shift in the UK labour market associated with the business models of digital platforms and more the more flexible forms of employment. The Taylor Review, *Good Work*, has recently drawn attention to the risks and trade-offs associated with the so-called 'gig economy' which organisations and policymakers will need to tackle in coming years.⁵⁴

What are the prospects for the skills pipeline over the longer term?

Whilst on the surface the supply of talent to the arts and cultural sector (and the wider creative industries) appears relatively healthy, there are reasons for caution. One factor which may impact the pipeline is the level of access to cultural education in schools (the ongoing debate on this is considered in Section 1), another set of issues relate to the wider trends impacting Higher Education Institutions (HEIs).

At first glance, indicators suggest that the demand for degrees related to arts and cultural occupations remains buoyant. Popularity appears consistent over the past five years, and there seems to be a sustained supply of graduates on creative arts and design courses to the arts and cultural sector (although in some specific cases there are skills shortages as referenced earlier).⁵⁵

However, there is evidence that arts subjects have not fared well in changes to Higher Education funding and policy. The policy focus on STEM subjects, such as the decision within the 2015 Spending Review to provide funding for a 'real terms protection for the overall budget for STEM subjects in Higher Education', has not been accompanied by comparable measures for those subjects of key importance to the creative industries.⁵⁶ More recently, reports of a proposed introduction of a top-up teaching payment of £1,500 for individual STEM subjects (to the exclusion of subjects related to the creative industries) was highlighted by the Creative Industries Federation (CIF) as a further example of the 'deprioritising [of] funding for creative Higher Education'.⁵⁷

The climate is particularly challenging for specialist art schools, which often act as a vital driver of innovation and entrepreneurship in the arts and wider creative industries. For example, the Royal College of Art (RCA), say that changes in policy mean they have lost 50 per cent of their government funding over the previous five years, and are therefore having to revise their business model to accommodate this reduction.⁵⁸

Another area of uncertainty for HE in the UK is future rates of applications from overseas students - a factor in the sustainability of some courses. CIF point out that for the University of the Arts London, courses are only viable to teach if 50 per cent of the course participants are international students rather than UK-based.⁵⁹ Currently, those from outside the EU are subject to higher fees than UK or EU students - some HE institutions could arguably see

a drop off in demand for arts courses in the event that Brexit leads to EU students being charged significantly higher fees. Meanwhile, if the UK is perceived to be a less attractive destination for all international students (beyond the EU) then there could be a further knock-on effect for the financial viability of some arts courses in UK HEIs.

The pressures facing HEI's teaching budgets for arts subjects, in tandem with the trends in schools and the downstream impact of Brexit, could have long-term implications for the supply of talent for the UK's arts and cultural sector. Considering the picture as a whole, several interviewees for this horizon scan were concerned about the outlook, noting that whereas the UK was once considered to be an international exemplar of how best to cultivate creativity (and by extension, the arts and cultural sector and creative industries), the commitment to investing in creative skills had faltered. There were some warnings against complacency about the future:

"We seem to be talking about [the GVA contribution of] 5.3 per cent in relation to the creative industries at the same time as blocking the pipeline at the beginning by cutting arts and creative subjects in school... It's just that we aren't going to see the impact of that for five or six years minimum. So, it's perfectly possible for a government to do it and the ship sails on, because we're completely unaware there's a large iceberg ahead."

Gerald Lidstone, Goldsmiths, University of London

"I fear that if we're not careful we will be the country that invented the creative industries and then let them go, rather than reinventing our creative industries for the next generation with the next big idea."

Pauline Tambling, formerly of Creative and Cultural Skills

3 The changing funding environment and business models

Drivers



Increase in:

Global art and tourism markets. London based institutions and major brands benefitting



International demand for tourism forecast to grow by

6.1% pa



Increased property prices:

with risk of creative activity being pushed out of urban centres

Reduction in:

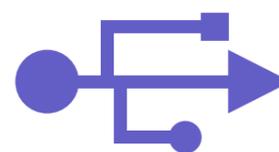
Levels of public funding available to arts and cultural organisations



16.6%

fall in English local authorities' spending on arts and culture between 2010-2015

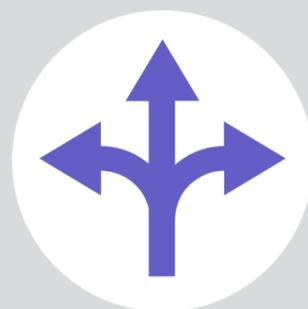
Implications



Organisations can tap into an international market, but also **face greater global competition**

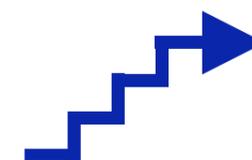
Financial pressure increases as organisations need to:

- Cultivate membership
- Enhance donor bases and increase the breadth of sponsorship opportunities
- Find new revenue streams



Risk of divergence due to a more competitive environment and varying skills, scale and profile of organisations. Some arts and cultural organisations are more likely to benefit from the opportunities than others

Opportunities



Innovations in funding models:

Eg. micropayments, crowdfunding and patronage platforms



Accessing risk capital to invest in new revenue streams

A market sizing survey for repayable finance indicates future demand of

£309 million

from arts, culture and heritage organisations spread over the next five years

Leveraging data and digital:

- Dynamic ticket pricing
- Licensing live-to-digital broadcasts or creating virtual reality content

3

The changing funding environment and business models

Context

Reduction in funding and long-term trends in public funding and Lottery receipts

Between 2010 and 2015 there was a 16.6 per cent reduction in spending by English local authorities on arts and culture, and over the same period Arts Council England's annual grant in aid income from central government rose in nominal terms, but fell by 4.38 per cent in real terms.⁶⁰ Furthermore, the funding received from the National Lottery is, in real terms, still some way below its late 1990s peak, and there have been concerns about declining ticket sales, which if sustained would further reduce funding for the sector. The current forecast from the Office for Budget Responsibility (OBR) is that Lottery expenditure is set to increase slightly in nominal terms.⁶¹

A global market and international visitors benefiting larger institutions with strong brands

Within museums and visual arts, major national collections attract substantially more visits than other institutions and collections. In Visit Britain's visitor attractions survey, the ten largest museums and galleries by visit numbers, all of which are in London, accounted for 48 per cent of the visits to the 417 museums and galleries in England that data is available for.⁶² Fifty-eight per cent of repeat visits to the UK are also to London.⁶³ This inevitably means that the major museums in the capital have much greater international visibility and visitor volumes that can be more readily monetised.

Regional differentiation across the UK

Although there is creative activity across the UK, a disproportionate amount of this activity is concentrated in London and the South East. In particular, London and the South East of England account for 43 per cent of employment in the UK's creative economy,⁶⁴ but only 28 per cent of the workforce as a whole.⁶⁵ There is also some evidence that this concentration in these areas is increasing.⁶⁶ This is concerning due to the geographic imbalance it creates in the UK's cultural offer, and also because creative employment is less likely to be automated and so more likely to provide sustainable employment in future.

The costs of space in cities for the arts

The increase in property prices that has occurred in the UK has made it harder for artists to find studio space. If property prices continue to follow this trend it would exacerbate this problem, particularly in areas where the issue is already most pronounced like London and the South East.⁶⁷ In London, property price increases have been most rapid in the centre, pushing creative activity away from the centre.⁶⁸ Over the long term, this trend could affect the range of work that is produced, the location of creative activity in the UK and the extent to which work is produced in the UK at all.

Impact of Brexit increasing uncertainty across the sector

It is estimated that the UK will leave the European Union in March 2019. The impact of this on the arts, as in other sectors, is potentially significant - and could affect the sector's access to international talent (see the 'Workforce and skills' section for more on this issue), export markets and sources of funding. The perception of the UK's creative industries internationally is also likely to be affected.⁶⁹ Uncertainty as to the details of a future Brexit settlement, has the potential to cause considerable disruption over the next few years.

Horizon to 2030

The environment in 2030 is, barring major geopolitical disruption, likely to be a globalised one, with more artistic activity and consumption happening around the world. International tourism will likely be higher than ever before. This will mean more commercial opportunities, but also more competition, both for the attention of consumers and to find spaces for artistic activity. Digital technology, new approaches to finance, and the exploitation of data are likely to become more important for commercial and operational activity.

Can all organisations benefit from the growth in global market opportunities brought about by tourism and digitisation?

International demand for tourism is forecast to grow by 6.1 per cent per annum.⁷⁰ This expansion presents an opportunity for UK arts and cultural institutions, and there is also evidence that regional tourism has increased.⁷¹ However, in general, the organisations best placed to take advantage of this trend are those which are already highly visible domestically and internationally. In practice this means the larger, publicly and privately funded cultural institutions (a high proportion of which are in London). These institutions are more likely to have the content and presentational capacity capable of attracting interest online and increasing their international profile, meaning that there is a risk that smaller cultural institutions are less able to benefit to the same degree. This is an argument for thinking more strategically about how smaller organisations can be promoted. A larger international market can provide more opportunities for smaller organisations, and there are examples of these achieving international recognition such as the 1927 theatre group and the Hofesh Shechter dance company. It also suggests that there is potential from continuing to explore the scope for the UK's most high profile cultural brands to have a presence in other regions of the country (as has happened with the Tate and Victoria and Albert museums).

Does a changing financial context mean that the approach of cultural organisations to risk finance and impact investment needs to change?

It seems clear that, over the next decade there will continue to be a pressing need to cultivate membership, enhance donor bases and increase the breadth of sponsorship opportunities. Arts and culture organisations need access to affordable risk capital to be able to invest in new revenue streams and to grow existing ones. The market sizing survey for repayable finance that Nesta recently commissioned indicates future demand from arts, culture and heritage organisations of £309 million spread over the next five years.⁷²

Pooled funds such as the Arts Impact Fund (and any successor and/or equity-investing equivalent) could be one means of providing this capital. Philanthropists and high net-worth individuals could replicate this model, if they wish to have more direct impact on an organisation or art form than is afforded by the portfolio approach. However, the scope for

these approaches to be developed further in the future will be partly dependent on how conducive the tax environment is. In practice, this might mean making it possible for direct loans to qualify for Social Investment Tax Relief or an arts-specific equivalent, or by making sure that any capital losses arising would be available to offset tax obligations.

By extension, governing bodies will need to be equipped in future to assess the risk/return of taking on new forms of investment, and will need to take responsibility for ensuring that there is appropriate expertise on the executive team to manage relationships with investors. A culture of active investors could prove to be beneficial to the skills base, mindsets and risk culture within organisations. Over time, the sector could stand to benefit from access to a broader spectrum of investments, from grants to venture-type capital.

Opportunities to generate revenue from digital platforms will continue to expand, but who will be able to access them?

Technological innovation is opening up a range of channels through which arts organisations can access funding, and this market is likely to be much more developed by 2030. In addition to innovations in crowdfunding, new sources of funding through micropayments and patronage are being created.⁷³ However, as with crowdfunding (where organisations that already have strong digital skills and an engaged constituency find it easier to access funding), it is likely that these funding sources will not be equally accessible to all organisations and will be more suited to specific projects:

"I think it [crowdfunding] suits organisations that have very clear projects better than an ongoing basis. So it's been more successful for specific productions, books, exhibitions, that sort of thing, then it has for kind of general costs."

Mark Robinson, Thinking Practice

Micropayments. Individual engagement with creative content is often fleeting, for example looking at a picture on an artist's website or walking past street art. In these kinds of instances, it has previously not been practical to transfer payment between the artist and audience. Micropayment systems address the technological barriers by making it easier for users to reward artists with small amounts of money. Micropayment models are increasingly being used in the music sector and are becoming more pervasive. The Dutch company Blendle, for example, offers a micropayment system for people who prefer to access media content (e.g single articles), without advertising.⁷⁴ Micropayment models are likely to become more sophisticated over the coming decade, but as the payment amounts tend to be relatively small, creative practitioners and arts organisations would require high volumes of use to generate significant income by this means.

Different models of 'crowdfunding' platforms which connect creators with audiences on an ongoing basis. Partly in response to low levels of revenue earned by creatives on platforms such as YouTube, there is a search for better ways of financially connecting creatives with those who enjoy their work. One example of this is the platform Patreon (as the name suggests the platform is built on the patronage model). Patreon (and alternatives like Drip) enables people to support creatives on an ongoing basis, with users registering as 'patrons' to provide creatives with a monthly payment (of which the platform gets a share), as distinct from the more one-off projects funded through other crowdfunding platforms such

as Kickstarter. In return patrons receive benefits such as early or unique access to content made available by the artist/creator. Jon Leland, Senior Director of Strategy at Kickstarter, expanded on how the Drip platform would help content creators:

"[Drip is about] having an intimate relationship with an artist. It is another way of taking the smallest number of highly engaged fans and really sustaining a practice from that group. So it becomes more important to have dedicated fans. This is certainly true on both Kickstarter and Drip, it's more important to have a smaller number of highly dedicated fans than a larger number of people that just kind of enjoy your work."

It is likely that this funding stream could become much more developed and sophisticated - creating new sources of funding over the long term. However, for revenue of any significance to be generated it seems likely that creatives would need a large and dedicated pre-existing fan base. This approach therefore seems less likely to be viable as a source of remuneration for those just starting out in their careers.

How can organisations unlock income from digital distribution and innovations such as dynamic pricing in future?

Digital distribution could present opportunities for arts and cultural organisations over the coming decade, for example licensing live-to-digital broadcasts, alongside the creation of virtual reality and other more experimental forms of content (see Section 4 for more on this). There are examples of digital distribution becoming established, but primarily this has been seen in larger cultural institutions to date. Since 2008 the Berlin Philharmonic has had a 'digital concert hall' which allows subscribers to access online live transmissions every season and access a video archive of past recordings. The site has several hundred thousand registered users internationally.⁷⁵ Arts and cultural organisations are already developing new approaches to licensing as a means of unlocking value for different types of audiences in different settings. For example the National Theatre On Demand In Schools project allows teachers to stream high definition recordings of theatrical productions in the classroom. It is important that this access is only given free of charge to teachers in UK schools, and that the National Theatre can also use revenue generated from the same intellectual property, shown to a broader audience, to fulfill its charitable objectives (for example, through NT Live).⁷⁶

Digital also enables institutions to optimise their commercial model in other ways - for example using 'dynamic pricing' where prices can be varied according to the demand levels for the time of day, or day of the week, increasing revenue and managing demand for exhibitions. Trialing of different dynamic pricing strategies at the Firestation Centre for Arts and Culture in Windsor, as part of the Digital R&D fund for the Arts found that pricing schemes could be created that increased revenue and which encouraged early booking, while not reducing visitor numbers.⁷⁷ The use of data can also underpin more sophisticated approaches to designing membership offers of different duration, to maximise revenue across different market segments.⁷⁸

However, looking ahead, there is a risk that many arts and cultural organisations (particularly smaller ones) may lack access to the skills needed adapt to this new commercial environment. There are structural factors which exacerbate this issue, as employees in smaller arts and culture organisations often perform multiple roles, leaving

limited time to invest in specialist training. Policy moves to invest in the skills of the workforce as a whole will be one part of the equation, but organisations may need to look at ways of sharing specialist skills between them in a more collaborative model - as Mark Robinson, Founder of Thinking Practice, suggests in the context of digital:

"I do wonder whether we should be thinking more about the five touring theatre companies in a city like Newcastle sharing a digital office [and exploring] structured collaborative ways of employing people."

Will arts and cultural organisations need to look for new ways of sharing resources to minimise costs?

Just as arts and cultural organisations may need to look for collaborative approaches when it comes to accessing specialist skills, it may be possible for them to minimise costs by working in partnerships. In some cases back office functions can be shared between similar organisations. One example of this is SPINE (Shared Partnership in the East) where the Cambridgeshire County Council's library service, Suffolk Libraries IPS, Suffolk County Council and Norfolk County Council library service share the IT for the libraries' management system, which has in turn led to wider collaboration.⁷⁹ More research and experimentation in this area could identify the costs and benefits of this approach to organisations and the sector more widely.

Does the risk of private artistic activity being priced out of London necessitate the development of new business models to support the capital's creative sector?

Given London's very high share of creative employment, a transfer of creative activity to other parts of the country could have some wider benefits. There are, however, reasons to be concerned about this possibility. Given the art market's global nature, the displaced activity may transfer to other countries, rather than elsewhere in the UK, threatening the status of London as an international hub, and ultimately the UK as a leader in the arts. There is also a risk of disrupting clusters which are an important part of the strength of the UK's wider creative industries. This is an argument for policies that strengthen creative activity outside the capital while simultaneously supporting its presence in the capital. With the current focus on the creative industries in the industrial strategy, there should also be a greater emphasis on the role that arts and cultural organisations play as part of cities' wider creative industry ecosystems and how this can be optimised.

One option, in the context of major cities, is to make more funding available for the acquisition of studio space or, alternatively, introduce mechanisms which ensure creative activity is embedded within new developments or otherwise protected within the planning system. There have been some developments in this direction which indicate new business models are possible. Another response is the expansion of co-working spaces: a business model where spaces are rented out to individual tenants, many of whom work in creative occupations. In 2017 there were at least 156 co-working spaces, up from 132 in 2014 (itself a 50 per cent increase since 2012).⁸⁰ This trend has also seen cultural organisations using these models. Somerset House for example has used some of its basement space to house over 100 resident artists and makers in its own studio space.

4 New technologies

Drivers



Digital technologies and new tech players in the field (e.g. Google Arts & Culture) have powered the **digitisation of collections** over the past decade

Public funding

is increasingly backing experimentation with technology e.g. via Arts Council England, Digital Catapult, AHRC, Nesta and Innovate UK

Interdisciplinary collaborations

between musicians, artists, performers and technologists are giving rise to:

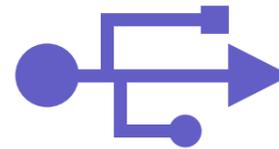
- Multimedia artworks
- Participatory, multi-dimensional experiences for audiences
- Works which mix 'high art' with more popular forms and challenge conventional definitions



Only **6%**

of museums (or associated organisations) have not digitised any assets at all

Implications



Digital has not revolutionised the practice of arts and cultural organisations

Organisations creating standalone digital works has remained static at **23%** since 2013

Organisations face challenges such as lack of funding to allocate to digital

62%

of organisations lack funding to allocate to digital

55%

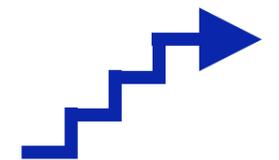
have difficulties in accessing external funding for digital projects



Experimentation is often dependent on partnerships with technology companies:

Arts and cultural organisations will need support in structuring these relationships to serve their needs over the long term, and maximise the wider public value created

Opportunities



Exponential growth in the size of the AR and VR market from **€700** million in 2015 to

€15 billion in 2020

Organisations can capitalise on this, via content partnerships, structured funding programmes, licensing arrangements and the development of in-house content creation

Acceleration in AI and machine learning creating opportunities for:

- Curators to classify and manage large data sets on collections
- Organisations to engage with visitors instantly via chatbots
- Pattern recognition to be used to identify trends in membership and fundraising, machine vision to be used in identifying forgeries
- Artists to create new work with AI and interact with digitised collections

4

New technologies

Context

Over the past decade, the use of emerging technologies in arts and culture has been uneven

The last decade could have represented a new dawn for the integration of digital in the arts and cultural sector, as institutions moved to harness new technologies. Yet in the main, such a wholesale revolution has not materialised. Between 2013-2017 there was no increase in the amount of 'born digital' work created by arts and cultural organisations, with the proportion of organisations creating standalone digital exhibits or works of art remaining static since 2013 at 23 per cent of organisations.⁸¹

One reason for this may be the difficulties that arts and cultural organisations face when it comes to working with digital and other technologies. According to the Nesta and Arts Council England's Digital Culture survey, the three most significant barriers to conducting digital activities are: a lack of funding to allocate to digital (62 per cent of organisations), a lack of in-house staff time (62 per cent) and difficulties in accessing external funding for digital projects (55 per cent).⁸²

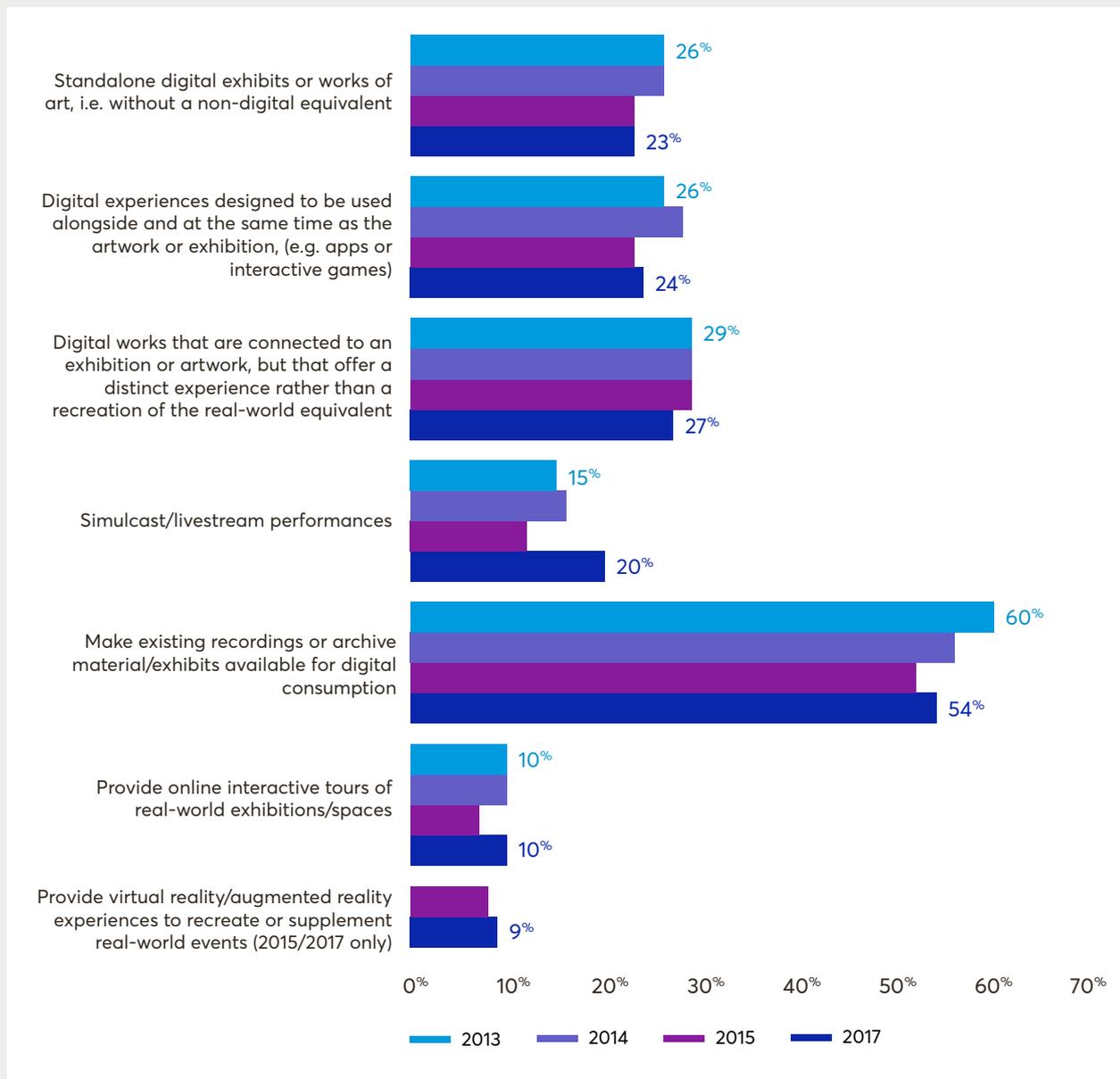
The nature of these challenges presents a related risk, that some larger organisations have the scale to experiment through in-house labs (such as the British Library Labs, or the Science Museum's Digital Lab) or in high-profile partnerships (like those between the Royal Shakespeare Company, Intel and the Imaginarium) - while other smaller or medium-sized organisations fall behind:

"I think that the divide I see is that the bigger institutions which have the resources to invest in innovation and technology will start to run further ahead than the smaller museums who don't have those resources."

Suhair Khan, Google Arts & Culture

However, scale can be an obstacle as well as an asset, as larger organisations are not always agile enough to test new technologies rapidly, partner with experimental external companies or integrate new practices across complex systems. Irrespective of scale, budgets for such R&D activity are commonly vulnerable across the sector, as Jonty Claypole, Director of Arts at the BBC, observes: *"Although it can result in outputs that captivate millions, R&D by nature isn't primarily audience facing. For that reason, it's the first thing that gets dropped when resource is stretched."*

Figure 4: Digital activities that arts and cultural organisations currently undertake 2013-2017



Source: MTM (2017) 'Digital Culture 2017.' London: Nesta and Arts Council England.

New technologies have increasingly been used in creative collaborations which blur art form boundaries

While the usage of emerging technologies in arts and culture has not 'broken through' across the sector, there have been significant developments in creative practice in relation to technology. In 2014 the retrospective exhibition *Digital Revolution* at London's Barbican Centre showcased some of these advances in the field of digital art, developing from early experiments in the 1970s through to newer participatory artworks such as *Assemblance* by Umbrellium.⁸³ Interdisciplinary collaborations between musicians, artists, performers and technologists now regularly generate multimedia artworks mixing 'high art' with more popular forms and challenging conventional definitions. Several of our interviewees emphasised the part that collaborations with technologists have played in advancing creative experimentation:

"Cross-disciplinary collaborations are vital in the emergent experiential sector. For example it's now possible for our creative team to work closely with programmers, animators, robotics/mechatronics experts, musicians, choreographers and set designers to bring immersive experiences to new audiences at location based experiences (LBEs) as well as before, during and post event with VR/AR/XR as well as digital platforms. The speed in which ideas can be realised is increasing almost as quickly as the creative ambition."

Robin McNicholas, Marshmallow Laser Feast

The application of technology to digital collections and archives

Over the past decade, the digitisation of collections and archives has become standard practice - with research by Arts Council England and Nesta demonstrating that only 6 per cent of museums have not digitised any assets at all. The aggregation of these collections has been facilitated by a number of different actors, such as Art UK, Wikimedia, and perhaps most publicly, Google Arts & Culture. Operating since 2011 as a non-profit arm of Google, reports indicate that they currently partner with 1,500 museums and cultural institutions in 70 countries - with 50 million people using the Arts & Culture website.⁸⁴

Despite digitisation having gained momentum in recent years, the exploitation of these digital assets, through curatorial, artistic or research-based projects has not expanded at the same rate. Currently, only 13 per cent of museums have conducted any work to 'repurpose collection records in the production of new digital content experiences'.⁸⁵ Nevertheless, there are signs of further experimentation on the horizon, in particular bridging the physical and virtual experience of collections.

For example, one new art discovery app (Smartify), uses image recognition technology so that users can scan images in a museum to reveal more information about the piece and related artworks - including those on display nearby. The app can be used to curate an individual's collection of 'favourite artworks'.⁸⁶ There are other efforts underway to make the relationship between audiences and collections a more tangible one, leveraging technologies such as 3D printing. One such experiment is *Museum in a Box*, which produces 3D-printed replicas of objects, together with information and context from museum curators, in a small box which can be sent to homes, schools or other locations.⁸⁷ Founder and CEO George Oates describes it as: "A tactile, interactive, exploratory, fun way to get museum objects out of storage and into people's hands'..... 'Just to be able to touch something, [is] kind of radical in museum land."

In addition to its work in digitising collections and archives, Google Arts & Culture is also supporting artists and others to engage with this content, through initiatives such as The Lab at the Cultural Institute which is aimed at 'experts, creatives, curators, artists, designers and educators' working at the intersection of culture and technology'.⁸⁸ Emerging from the Lab have been projects such as X Degrees of Separation, which uses an algorithm to map the visual connections between two different digitised works.⁸⁹

Experimentation with AR, VR and Artificial intelligence is still in its early stages across the sector

Innovation with AR, VR and immersive technologies has been tentative within the arts and cultural sector. To date, only 9 per cent of arts and cultural organisations report developing virtual or augmented reality in 2017, with no increase since 2015. However, there are signs that virtual reality in particular, along with some uses of augmented reality, is beginning to gain traction within the sector. While home headset ownership in the UK is only 6 per cent of the population, technology companies are betting on this growing in the home over the next few years.⁹⁰ Recent years have seen a number of larger cultural institutions in the UK experiment with virtual reality as a supplementary experience alongside exhibitions, such as the Tate Modern's *Modigliani VR: The Ochre Atelier*, which ran inside the 2017 *Modigliani* exhibition.

The uses of augmented reality are not yet as developed as VR, and its main applications have so far been in the context of gaming (for example, Pokemon Go). To date, uses of AR have largely centred on creating additional ways of engaging with physical content, such as the AR art book *La Neige n'a pas de sens*⁹¹ where illustrations come to life through an accompanying app. There have, however, been some attempts to use AR to create new ways of interacting with culture in physical settings (such as the Jeff Koons x Snapchat partnership which saw the installation of virtual sculptures in locations across the world for users to discover and interact with).⁹²

Public funding has started to support artistic and cultural content creation in this space, with Arts Council England, Digital Catapult (Creative XR), the AHRC (The Future of Immersive Experiences) and Innovate UK (Audience of the Future) all developing funding programmes in this area. These developments show a growing acknowledgement on the part of public bodies that 'immersive' holds out real potential for the wider sector.

Another emerging technology of growing significance to the sector is Artificial Intelligence. Developments in this field have accelerated rapidly with the advancements in data-processing chips, access to big data sets and breakthroughs in the design of machine learning algorithms. Artificial Intelligence (AI) allows machines to learn from data and experience - quickly improving their performance on new tasks. Recently, AI has made breakthroughs in tasks like image or voice recognition, text analysis, translation and games - areas where there is an underlying structure to the data that can become a function for artificial intelligence to 'solve'. AI by definition is a technology optimised for handling big datasets, including finding structure, or 'making sense' of them.

A number of projects are beginning to explore the scope for AI to deliver efficiencies, innovate and extract value from vast stores of data held by cultural institutions. For example, at Washington DC's National Museum of Natural History, a collaboration between research botanists, digitisation experts and data scientists recently used 'digital neural networks' to put an algorithm to work in the classification of two families of plants - yielding highly accurate results for the kind of task which is typically time-consuming for humans.⁹³ Meanwhile, in the UK, the National Gallery has worked with a company called Dexibit to apply Artificial Intelligence to museum attendance, attempting to use predictive analytics to anticipate future levels of visitors rather than simply using historical data.⁹⁴

Horizon to 2030

In this section we look ahead to consider some of the prospects for the technologies discussed, namely VR, AR, MR and AI. There are questions as to how well the arts and cultural sector, which typically faces challenges in working with technology, can harness these technologies - with the possibility that there could be an increasing divergence between those organisations capable of capitalising on some of these opportunities, and those who lack the resources to do so.

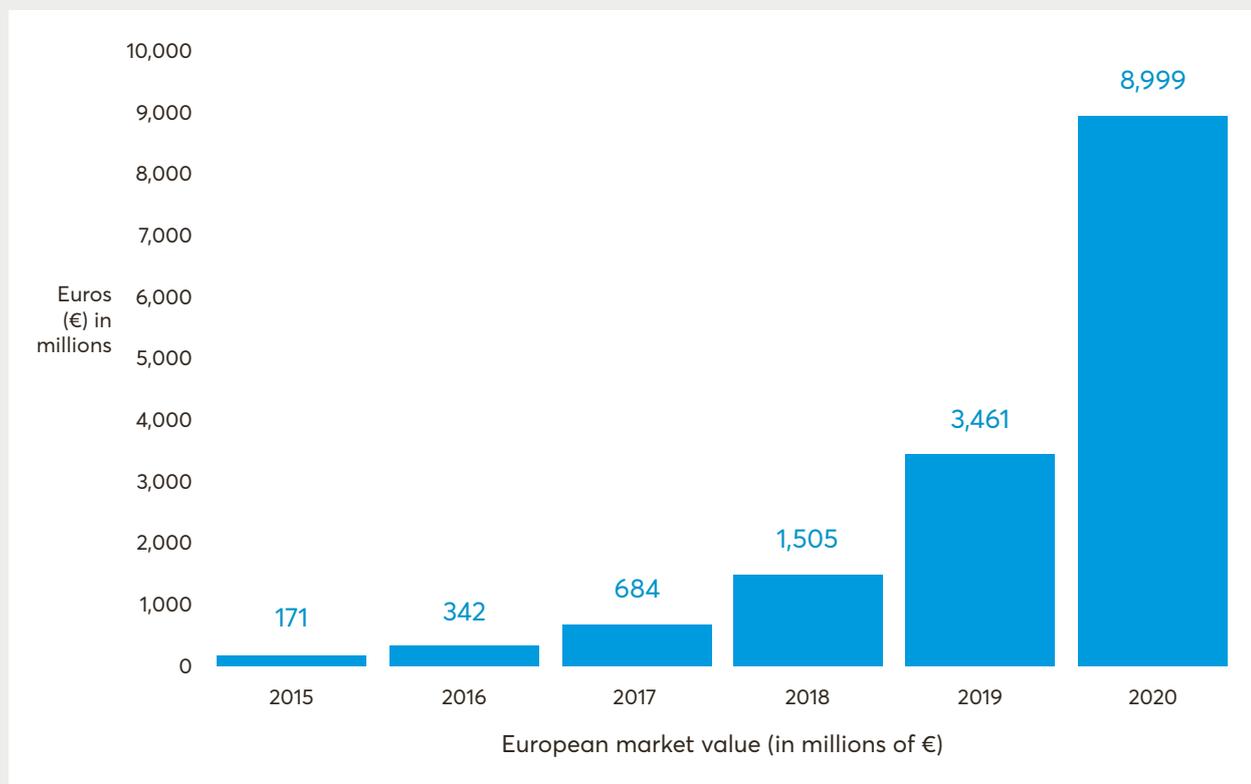
What is the potential of AR, VR and 'mixed reality' for arts and cultural organisations in future?

At a global level, the next ten years are set to see a marked shift in the adoption of these technologies - with implications for arts and cultural organisations. Ecorys, in their analysis of the AR and VR market, expect an exponential growth in the size of the market - from €700 million in 2015 to at least €15 billion in 2020.⁹⁵ The arts are well placed to capitalise on this, via content partnerships, structured funding programmes, licensing arrangements and the development of in-house content creation (through labs such as those in operation at the Science Museum and National Theatre).⁹⁶

The future use cases of AR and VR in the sector are numerous. Virtual galleries and performances could be another means of engaging audiences across dispersed geographies and could also open up new revenue sources. Collaborations with VR producers could give theatre practitioners or musicians new ways to deliver their content, and art form innovation could come through the use of technology as well. Marshmallow Laser Feast's recent site-specific *In the Eyes of An Animal* show the possibilities of crafting experiences of art in the virtual world. Within the museum sector, Australian company Lithodomus VR have been creating site-specific VR content for museums and archaeological trails, such as VR tours of the Athenian Acropolis.⁹⁷

Looking further ahead, the emergence of so-called 'mixed reality' may also present new possibilities for the arts and cultural sector. Mixed reality merges the physical and digital environments, usually via the use of a headset or glasses. In this new landscape, digital assets are overlaid over the real world, interacting intelligently with their surroundings through machine learning.⁹⁸ At the recent unveiling of Magic Leap's mixed reality collaboration with the Icelandic band Sigur Ros, one Pitchfork journalist noted that digital layer around him: "*Isn't just something pasted over my surroundings, but something that acknowledges those surroundings, and therefore seems more real.*"⁹⁹ The timeframe for the adoption of mixed reality is less certain, but this kind of experimentation does have the potential to affect distribution models and artistic output - with implications across the whole value chain.

Figure 5: Projected growth of virtual reality and augmented reality content market in Europe



Source: Ecorys, *Virtual Reality and its Potential for Europe* (2016)

How might the sector start to experiment with the applications of Artificial Intelligence in future?

“The cultural sector, and its lead bodies, have to get much better at dealing with big picture drivers. Take AI as one example. It’s already profoundly shaping the way content is found (which is embedding the influence of large search and content aggregation sites). And AI will increasingly shape all kinds of artistic practice and the ways in which people can creatively express themselves. We need sector leadership on these types of issues to frame a richer national conversation and ensure this next wave of innovation is shaped by artists, and our shared creative aspirations. And let’s not forget that next generation cultural business models and growth will be in the tramlines of these new disruptions.”

John Knell, Culture Counts

Over the next decade, AI is set to have a profound impact across numerous sectors, and arts and cultural organisations will not be immune from the effects. Here, we consider two specific applications which will be of relevance to arts and cultural organisations: the opportunities AI presents for operational innovation and the extent to which artists could adopt it as a tool to both create artistic work and interact with digitised collections.

There are a number of operational use cases of AI for cultural institutions. In a paper on AI submitted to *Museums and the web 2017* Brendan Ciecko recently suggested several, including applying machine learning pattern recognition to find trends in membership and fundraising activities, in addition to using machine vision to help distinguish between forgeries and authentic pieces of art.¹⁰⁰ Meanwhile, according to the Center for the Future of Museums, the back office efficiencies associated with AI need not be restricted to large institutions and are not dependent on access to in-house specialist knowledge:

“Rather than displacing staff, AI can give smaller museums that can't afford dedicated specialists access to AI-powered legal services, marketing, communications, and data analytics itself will not necessarily require AI-specific expertise.”

The Center speculates that natural language processing algorithms could also be used to help answer visitor questions about exhibitions instantly, or plan visits.¹⁰¹ AI and machine learning will also open up further creative possibilities in relation to interacting with digital collections. As Mia Ridge, Digital Curator of the British Library, explains, institutions are fostering new relationships with artists and researchers who bring the specialist skills needed to unlock the value of these collections or archives for wider communities of interest:

“It could be an artist looking for inspiration, or it could be, in our case, scholars looking to apply computational methods to digitised collections to understand, to ask questions at scale [...] you have to nurture those creatives because they're the ones who actually make the product that the public gets access to the collections through.”

In 2016, the Tate's IK Prize invited entrants to use artificial intelligence to explore British art in the Tate collection.¹⁰² The winner *Recognition* by Fabrica allowed visitors to the gallery to interrupt a program which continuously matched news photographs from Reuters to artworks in the Tate collection - suggesting their own choices and 'retraining' the machine in the process.¹⁰³

Looking beyond the application of AI to collections, AI is becoming part of the creative toolkit, with artists and performers now 'collaborating' with AI in live works, testing the ability of human performers to respond in real-time. Examples include Alexander Whatley and Memo Akten's *Pattern Recognition*, a choreographed performance where a set of lights programmed using AI continually follows a dancer's movements,¹⁰⁴ or Yotam Mann's *AI Duet*, an interactive online work where an AI generates its own piano riffs in response to a human's offering.¹⁰⁵

How can arts and cultural organisations be supported to realise the value of partnerships with technology companies?

Much of the future work with emerging technologies in arts and cultural institutions will be dependent on partnerships with technology companies that can bring specialist knowledge and tools. However, a quarter of arts organisations lack suitable external suppliers for digital projects and almost a third (30 per cent) lack expert advice on their digital projects.¹⁰⁶ Publicly-funded arts organisations may also have to reconcile their priorities with those of the private businesses they collaborate with - as George Oates of *Museum in a Box* observes, this could create tension between competing agendas in future:

"Corporations the world over now hold what you might call cultural assets... certainly representations of our collective histories. I'm concerned that corporate interests are so different from a cultural organisation's, because they are rarely concerned with real longevity."

It may be hard for arts and cultural organisations to anticipate the longer-term implications of technological partnerships, for example as collections become widely accessible online (for free) an organisation may risk limiting revenue streams from paid-for imagery or other types of IP like recorded performances. Arts and cultural organisations will need to understand how these new relationships can be structured to serve their needs of the long term - and maximise the wider public value they create.

All organisations stand to benefit from sector-wide learning on 'what works' in the contexts of such partnerships and ongoing experimentation with emerging technologies. As Chris Michaels, Digital Director of the National Gallery, explains, larger institutions can play a particularly valuable role in pioneering new approaches for the sector as a whole in future:

"So, if we do something with big data, AI, whatever we've got to find the communication model and method that helps us share on that knowledge with others. Because it's a process, we've got to start it, then others are going to follow on from it, but they'll do things that we don't do, and then we've all got to learn collaboratively from each other."

Conclusion: Charting a course to 2030

1
Audiences and participation

2
Workforce and skills

3
The changing funding environment and business models

4
New technologies

1. Experimentation

2. Leveraging data

3. Shaping and sustaining partnerships

4. Reaching wider audiences

Conclusion: Charting a course to 2030

This paper opened with the observation that, by the standards of other parts of the creative industries, whose practices have been disrupted by technological progress and changing consumer behaviours, the UK's publicly supported arts and cultural sector has enjoyed a long period of continuity. One aspect of this might be the constancy of policy in this area, at least since the establishment of the Arts Council.¹⁰⁷

While UK arts and cultural organisations act in pursuit of their own particular missions, they do so in a framework where they are each asked to reconcile the production of excellent cultural products with wide and inclusive participation - and they have done so for years. Reflecting on the nature of this creative tension in the context of larger organisations, Deborah Bull observed:

"I think the tension for some of those big organisations is how to straddle that, how to ride that particularly challenging horse, if you like, between presenting, promoting and pushing the best, the greatest, the future, the legacy of the future, and the idea of promoting everybody's cultural capabilities and being inclusive."

To succeed in this balancing act over coming years, arts and cultural organisations will undoubtedly need to be equipped with better evidence of the value they create for the audiences they reach, all the more so in the face of continued pressures on government spending. Many of our interviewees saw this moment as an important chance for the sector to make a more compelling case for the holistic integration of artistic excellence with social and economic benefits.

In addition to the overarching questions around inclusiveness and their role in creating public value, arts and cultural organisations will have to contend with the ripple effects of the complex technological, demographic and socio-economic trends considered in this paper. If they are to prove robust in response to the uncertainties of the next decade, many will find it valuable to build their capacity across the following areas:

- 1. Experimentation**
- 2. Leveraging data**
- 3. Shaping and sustaining partnerships**
- 4. Reaching wider audiences**

1. Experimentation

"I think it's critical to build that [structured experimentation], and I guess it's a two-directional process. One has to be a bottom-up process where there is talent coming through and there's entry points with smaller projects, but there also has to be a top-down where the senior executive, the senior leadership of these institutions values smaller-scale experimentation."

Seb Chan, Australian Centre for the Moving Image

UK arts and cultural organisations, and the artists and practitioners that work in and around them, have a reputation for producing bold, exciting and often highly innovative work. Despite this, there remains a consistent sense that the sector as a whole has been slow to harness technology effectively, exploit assets in a more joined-up manner (both physical and digital) and bring in new practices from other fields.

Cultivating a culture of experimentation, ranging from pragmatic and small-scale tests through to large-scale trials and engagement in R&D (that may in future be eligible for specific financial support)¹⁰⁸ is one strategy arts and cultural organisations could look to in order to build capacity and resilience to change. The rewards can be great - experimentation in the arts over the last ten years has led to new value chains being developed around digital assets, the creation of pieces of groundbreaking work and IP (such as the R&D work around the National Theatre's production of *War Horse*)¹⁰⁹ and new platforms for audiences to find tickets (such as the music app DICE that uses world-class user experience design to draw in new customers).

Over the next ten years we anticipate that arts and cultural organisations of all sizes will need to experiment more proactively - as we have seen in industry and in other parts of the third sector. In doing so they will be able to draw upon a toolbox of different methods, selecting approaches which are appropriate to their networks and capabilities, such as:

- **Data-led R&D**, working predominantly with academic partners or researchers to test knowledge propositions that lead to the generation of academic research outputs, alongside valuable innovations for the arts and cultural organisations. One area where we have seen rapid advances in the commercial creative industries is the use of data analytics to develop price discrimination and dynamic ticket pricing strategies, and we should expect to see this become widespread in the arts and cultural sector too. Larger organisations are well-positioned to develop the expertise to undertake such experimentation in-house.
- **Design thinking techniques**, including prototyping and user-experience testing for products. This is now relatively standard practice amongst larger cultural institutions (and particularly within digital teams and product development), but the next decade will likely see wider application of these methods across the sector.¹¹⁰
- The employment of specific project management or testing techniques such as **lean development and agile project management**, which have emerged from software and digital product development but are finding wider applicability across a range of different sectors.

In some instances, experimentation has been supported by public funding programmes aimed at spurring innovation for individual artists, creative businesses and arts organisations. Examples include the Digital R&D Funds for the Arts, run by Arts Council England, the Arts and Humanities Research Council (AHRC) and Nesta (and its various sister-funds in Wales and Scotland), the Arts and Technology pilots supported by Arts Council England and Innovate UK,¹¹¹ the AHRC's Knowledge Exchange Creative Economy Hubs and, more recently, the AHRC's new Creative Industries Clusters Programme,¹¹² and the new Audience of the Future Challenge Fund - both supported by the Industrial Strategy Challenge Fund.¹¹³

The wider benefits to the arts and culture of such experimentation exceed those derived by individual organisations alone. In science and technology-intensive sectors where R&D is more institutionalised, and the knowledge created codified and thereby shared, the social benefits of R&D exceed the private benefits. The experience of science and technology R&D points to the need for policymakers to build a policy framework that makes equally sure that the wider arts and cultural sector benefits from experimentation by individual arts and cultural organisations.

2. Leveraging data

If experimentation increases in volume over the coming years, it will need to become underpinned by more rigorous data capture and analysis. Beyond supporting experiments, increased data capabilities can also enable organisations to optimise business processes, analyse their cultural assets, better understand their existing audience and reach new ones.

Innovations from the marketing and corporate communications worlds in areas such as audience segmentation and social media advertising can be harnessed by arts and cultural organisations to their benefit in coming years. The advent of artificial intelligence and machine learning opens up further exciting opportunities to create value from data - for artists, curators, managers and others.

However, for many arts and cultural organisations there is a long way to go before it is possible to extract value from the data they hold. Data input and analysis both require skills and specialisation in the workforce. Currently, in many institutions or organisations data is often not systematically collected and, even where it is, it may not be analysed in depth. Developing the sector's capabilities in this area will require attention at all stages of the skills pipeline, as Gerald Lidstone, Director of the Institute for Creative and Cultural Entrepreneurship at Goldsmiths, University of London, noted:

"Students need to be competent with data. They need to be able to understand and analyse data, and that could be big data, but it might also be 'little data' that they have collected, because that often relates to that ability to develop audiences."

Looking beyond the value of using data to inform decision-making in individual institutions, marshalling more robust evidence will also help to better capture the public value created by the sector as a whole, and is thus one dimension to sustaining support for public investment in arts and culture. One persistent challenge in measuring the benefits that

cultural institutions create for society is that, as many are free, there is no clear market price providing a measure of value for users. However, there is a growing evidence base on the benefits of these activities that larger cultural institutions can start to draw on in order to make their case to local and central policymakers and funders.

3. Shaping and sustaining partnerships

"We can't build the taste and desire for cultural expression and participation in all areas of the country unless we are in much deeper partnerships with local authorities, libraries, health providers, and a long list of other key stakeholders."

John Knell, Culture Counts

The challenges and opportunities presented by partnerships have been an enduring theme of analysis of the publicly-funded arts and cultural sector. Partnerships have been central to the sector's history, and are now increasingly being positioned as integral to its future. For example, in 2013, the RSA (with the Arts Council) explored the idea of 'grand partnerships' in *Towards Plan A*.¹¹⁴ Yet despite the ubiquity of 'partnerships' both in rhetoric and practices throughout the sector, there is little consistency in the use of the term - with considerable variation in the **form** partnerships take and the **purpose** for which they are created.

In considering the **form** of relationships, King's College London's *Cultural Enquiry* into partnerships offered a taxonomy of the spectrum of relationships that arts and cultural organisations build - from relationship to donors and funders, through to shared procurement arrangements and 'one-off' partnerships commonly formed to deliver a single project. Arrangements might involve two partners working closely together through to a loosely aligned network of numerous organisations. In light of the diversity of the collaborative practices in existence, the Enquiry points to a simple definition from The Partnering Initiative and the Partnership Brokers Association as a starting point: "*Partnership is an ongoing working relationship where risks and benefits are shared.*"¹¹⁵

The need to share risks and rewards in this way will only become more acute for arts and cultural organisations in the next decade, sharpening the sense of **purpose** behind the partnerships they form. In his review of the history of partnership in the arts and cultural sector, Dr James Doeser observes that, "*While there [is] complexity and scarce resources there will be the need for partnership.*"¹¹⁶ Given that scarcity of resource and complexity are likely to characterise their experience of the coming decade, arts and cultural organisations will increasingly need to look for partnerships which allow them to:

1. Reach new audiences and deepen relationships with existing ones (to counter the polarisation in audiences for the arts).
2. Develop the specialist skills of their workforce (to mitigate the possible effects of Brexit and improve capabilities in digital, data and community engagement).

3. Tap into new sources of revenue and create efficiencies through shared services, facilities and procurement (to offset any possible decline in access to public funding and to develop more competitive business models).
4. Experiment with the potential of new technologies (to enhance the experience of audiences and leverage the value of the digital assets they hold).

The 'push' to partner will be reinforced by a 'pull' factor in the form of a favourable policy climate. The previous decade has already delivered a pronounced turn towards place-based strategies in the wider creative industries, and this has been echoed in the Arts Council's own efforts to create greater alignment between organisations working together at the local level.¹¹⁷ Looking ahead, this emphasis on new models of local collaboration could be advanced by the downstream effects of local devolution deals and Local Enterprise Partnerships. The Industrial Strategy is also set to unlock funding in the form of the AHRC's Creative Clusters Programme to support partnerships between industry and groups of universities in a local area.¹¹⁸ Similarly the popularity of, and continued investment in, place-based festivals (such as the UK City of Culture and the Great Exhibition of the North) offers another type of platform for actors in the arts and cultural ecosystem to work together.¹¹⁹

Notably, several of these opportunities have positioned Higher Education Institutions (HEIs) as central partners, not just in supporting knowledge transfer, but in acting as local convenors. One example of the latter in action can be seen in the collaboration between the University of Warwick, Coventry University, Coventry Council and local enterprises to mobilise around Coventry's successful bid to be named UK City of Culture in 2021.¹²⁰ In an interview, Professor Neelands of the University of Warwick explained that such efforts reflected a wider acknowledgement of the fact that:

"...given the cuts to grant-in-aid that local government has faced over the last five or six years, there's no way a city council on its own can deliver essential services to the most needy and vulnerable, and also keep a strong cultural offer for all. So.. we have to look both at how do the anchor institutions share their resources, expertise and spaces to maximise the cultural offer to the city, and how through partnership we leverage a mixed economy, not just around philanthropy and fundraising but also big business interest... So I think there are all kinds of new partnerships, new opportunities, new ambitions, new sources of funding and resourcing which are really key."

The resulting ten-year Cultural Strategy for Coventry is just one example of how place-based alliances might expand access to cultural experiences and support long-term planning.¹²¹ Indications suggest this kind of experimentation will gather additional momentum in coming years, and arts and cultural organisations may therefore wish to start investing in the competencies needed to sustain an increasingly sophisticated array of partnerships.

4. Reaching wider audiences

When asked to look ahead to the prospects for the future of the arts and cultural sector, many of our interviewees were preoccupied by an overarching threat to the sustainability and legitimacy of public funding for the arts - that of its relevance to audiences and society at large. Concerns about dwindling access to cultural education in schools has only heightened fears about inequitable patterns in access to arts and cultural experiences reflecting (or even reinforcing) existing inequalities. The Warwick Commission has been one of several efforts to focus attention on the issue of social stratification in cultural consumption and production, and its final report noted that the failure to address this would be to the long-term detriment of society and the economy - not just the creative industries.¹²² In his interview, John Knell made the case for a more proactive engagement with the country's socio-economic divisions on the part of arts and cultural organisations:

"The social mobility crisis has many causes, but it's not helped by the deeply unequal opportunities for cultural expression across the UK. Inclusive growth in the UK requires a much more inclusive cultural sector committed to holding open doors, transforming the way it looks and works, and which is contracting with the future much better in terms of displaying leadership and new thinking on how the cultural sector can impact on young people's life chances and social mobility. Where is the long-term programmatic work and thinking on this issue, led by the arts, that extends the cultural, economic and social benefit of the arts to the many?"

Individual organisations will adopt different strategies in order to 'extend' the benefits of the arts more widely - some may look to respond by fostering deeper relationships with their local community, whereas others may leverage emerging technologies to target specific audience niches in new locations. Nesta's *Culture of Innovation* builds on a framework originally derived from McCarthy and Jinnett to outline the three routes to expanding audience 'reach'. Organisations can increase levels of participation by 'audience broadening' (capturing a larger share of the population segment known to be traditional participants but who currently do not attend), 'audience deepening' (intensifying the level of level of involvement for existing participants) or 'diversifying audiences' (attracting new groups).¹²³

It seems certain that ongoing work to broaden, diversify and deepen relationships with audiences will be of critical importance in securing support for public spending on the arts in future. For many organisations this will be a case of gaining deeper knowledge of the appetites and behaviour of existing audiences to build on success, as Chris Michaels of the National Gallery, observed: *"I think the sector has already got new audiences, it just doesn't understand them well enough to know what to do with them yet."*

Many arts and cultural organisations have already successfully weathered decades, in some cases centuries, of social and economic change by fostering a culture of creative risk-taking - often reimagining their relationship to society and to audiences in the process. This dynamism and spirit of reinvention will be vital in sustaining their relevance to a broad cross-section of society over the coming decade, as James Murphy of Southbank Sinfonia observes:

"Once upon a time the symphony orchestra wasn't an antique, it was the most thrilling thing, and it's about making sure we don't lose that thrill."

Appendix 1: Methodology

The starting point for this paper was a joint internal session between Nesta and Arts Council England in November 2017, to identify some key lines of enquiry. From January to February the Nesta team drew on the following sources of insight and evidence:

- A series of semi-structured interviews with experts, practitioners (see below).
- Literature, research and the existing evidence base about the sector.
- Insights from Nesta's grants programmes, previously published research and analysis.

We conducted 22 interviews between January and February 2018. This group of interviewees does not constitute a 'representative' sample on grounds of geography, art form or demographic indicators. They were selected on the basis that they could provide an informed perspective on audiences of the future, issues impacting the sector's workforce, emerging business models or experimentation with emerging technologies. We also wanted to hear from individuals who were well-positioned to reflect on their experiences of:

- Innovating, testing or experimenting with new tools, technologies or methods.
- Working in a range of organisational forms (from grassroots arts organisations to major institutions, technology companies and universities).
- Fostering international collaboration.
- Exploring big picture trends or working on a specific agenda for the sector over an extended period of time.

We are very grateful to the following for their generosity with their time and insights:

Deborah Bull, Assistant Principal
(London), King's College London

James Murphy, Managing Director,
Southbank Sinfonia

Matt Belcher, Communications
Director and Creative Director
(#ConcertLab), Southbank Sinfonia

Jonty Claypole, Director of Arts,
BBC

Seb Chan, Chief Experience Officer,
Australian Centre for the Moving
Image

Skinder Hundal, Chief Executive,
New Arts Exchange

Jo Joelson, artist, London Fieldworks

Tim Joss, Chief Executive and
Founder, Aesop

Suhair Khan, Google Arts & Culture

John Knell, Director, Culture Counts

Jon Leland, Senior Director of
Strategy and Insights, Kickstarter

Gerald Lidstone, Director of the
Institute for Creative and Cultural
Entrepreneurship, Goldsmiths,
University of London

Robin McNicholas, Co-founder and
Creative Director, Marshmallow
Laser Feast

Chris Michaels, Digital Director,
National Gallery

Jonothan Neelands, Academic
Director for Cultural Partnerships,
University of Warwick and Professor
of Creative Education, Warwick
Business School

George Oates, CEO and Founder,
Museum in a Box

Mia Ridge, Digital Curator, British
Library

Paul Roberts OBE, Chair, Innovation
Unit

Mark Robinson, Founder, Thinking
Practice

Beatrice Pembroke, Former Director
of Creative Economy, British Council
(now Director, Global Cultural
Districts Network)

Sian Prime, Deputy Director of the
Institute for Creative and Cultural
Entrepreneurship, Goldsmiths,
University of London

Pauline Tambling CBE, Former Chief
Executive, Creative and Cultural
Skills

Anna Lowe, Co-Founder and
Director of Partnerships, Smartify

Endnotes

1. Social Mobility Commission (2017) 'State of the Nation 2017: Social Mobility in Great Britain.' London: Social Mobility Commission.
2. Cribb, J., Hood, A., Joyce, R. and Keiller Norris, A. (2017) 'Living Standards, Poverty and Inequality in the UK: 2017.' London: The Institute for Fiscal Studies. See: <https://www.ifs.org.uk/publications/9539>
3. DCMS (2017) 'Taking Part Survey, England Adult Report 2016/17.' London: DCMS.
4. Arts Council England (2010) 'Active People Survey Analysis.' See, <http://www.artscouncil.org.uk/participating-and-attending/active-lives-survey#section-4>
5. The Warwick Commission on the Future of Cultural Value (2015) 'Enriching Britain: Culture, Creativity and Growth.' Coventry: University of Warwick. For an interesting discussion on the history of audience engagement, see: Kawashima, N. (2000) 'Beyond the Division of Attenders vs Non-attenders: a study into audience development in policy and practice.' (Coventry: Centre for Cultural Policy Studies, University of Warwick).
6. The Education Policy Institute defines these through the report as 'arts qualifications are defined as those which relate to the following subject areas: art and design; drama and theatre; media, film, and TV studies; music; dance; and performing arts'.
7. Johnes, R. (2017) 'Entries to Arts Subjects at Key Stage 4.' London: Education Policy Institute.
8. Cultural Learning Alliance (2016) 'Technical Briefing: English Baccalaureate.' London: Cultural Learning Alliance.
9. YouTube Blog, 'Stormzy: Gang Signs and Prayer'. See, <https://artists.youtube.com/blog?id=2bd2e397e5c74896b8cc02a70e2fbbcc>
10. Ofcom (2017) 'Adults' Media Use and Attitudes.' London: Ofcom.
11. Voluntary Arts Network 'Why we're here'. See, <https://www.voluntaryarts.org/why-were-here>
12. 64 Million Artists (2016) 'Everyday Creativity: from Great Art and Culture for Everyone, to Great Arts and Culture by, with and for Everyone.' 64 Million Artists.
13. Jubb, D. (2017) 'How can cultural centres also be community centres?' Battersea Arts Centre blog. See, <https://batterseartscentreblog.com/2017/12/31/how-can-cultural-centres-also-be-community-centres/>
14. ONS (2016) 'Population Projections 2016: Dataset.' Newport: ONS.
15. DCMS (2017) 'Taking Part Survey: England Adult Report 2016/17.' London: DCMS.
16. Dobbs, R. et al., (2016) 'Urban World: The Global Consumers to Watch.' McKinsey Global Institute.
17. Green, M. et al., (2017) 'Summary of Age UK's Index of Wellbeing in Later Life.' London: Age UK.
18. Schneider, P., Bakhshi, H. and Armstrong, H. (2017) 'The Future of Skills: Trends Impacting on UK Employment in 2030.' London: Nesta and; Duffy, B., Shrimpton, H. and Clemence, M. (2017) 'Millennial Myths and Realities.' London: Ipsos MORI.
19. Duffy, B., Shrimpton, H. and Clemence, M. (2017) 'Millennial Myths and Realities.' London: Ipsos MORI.
20. Schneider, P., Bakhshi, H. and Armstrong, H. (2017) 'The Future of Skills: Trends Impacting on UK Employment in 2030.' London: Nesta.
21. Culture 24 (2018) 'A Culture of Lates: How do Museums Lates build audiences & generate income?'
22. UK Music (2017) 'Wish You Were Here: The Contribution of Live Music to the UK Economy.' London: UK Music and; BPI (2018) 'Rising UK music consumption enjoys fastest growth this Millennium.' London: BPI. See, <https://www.bpi.co.uk/news-analysis/rising-uk-music-consumption-enjoys-fastest-growth-this-millennium/>
23. Dobbs, R. et al., (2016) 'Urban World: The Global Consumers to Watch.' McKinsey Global Institute.
24. For the distinction between the official creative and cultural sectors see Table 2.1 of: DCMS (2017) 'Sector Economic Estimates Methodology.' London: DCMS.
25. DCMS (2017) 'DCMS Sectors Economic Estimates 2016: Employment - Creative Industries Sub-Sector.' London: DCMS.
26. DCMS (2017) 'DCMS Sectors Economic Estimates 2016: GVA.' London: DCMS. See also: DCMS (2017) 'DCMS Sectors Economic Estimates 2016: Employment and Trade.' London: DCMS.
27. DCMS (2017) 'DCMS Sectors Economic Estimates 2016: Employment in DCMS sectors.' London: DCMS. See Table 3.1.
28. Easton, E. and Cauldwell-French, E. (2017) 'Creative Freelancers.' London: Creative Industries Federation and; ONS (2017) 'UK business activity, size and location.' Newport: ONS.
29. DCMS (2017) 'DCMS Sectors Economic Estimates: Employment in DCMS Sectors.' London: DCMS. See Table 3.2.
30. Ibid., see Employment Occupations - Creative Industries and Digital Sector.

31. Arts Council England (2018) 'Equality, Diversity and the Creative Case.' London: Arts Council England, p4.
32. Ibid.
33. Mateos-Garcia, J., Klinger, J. and Stathoulopoulos, K. (2018) 'Creative Nation: How the Creative Industries are Powering the UK's Nations and Regions. London: Nesta; and <https://www.ethnicity-facts-figures.service.gov.uk/ethnicity-in-the-uk/ethnic-groups-by-region>
34. Arts Council England (2018), op. cit., pp12-13 and p30 and; Centre for Women & Democracy (2013) 'Sex and Power 2013, who runs Britain.' Leeds: Centre for Women & Democracy and Counting Women In.
35. For example, Project Diamond (See, <https://creativitydiversitynetwork.com/diamond/>), BFI Diversity Standards (See, <http://www.bfi.org.uk/about-bfi/policy-strategy/diversity/diversity-standards>), Creative Access (<https://creativeaccess.org.uk/>).
36. Sleeman, C. (2017) 'Women in film: what does the data say?' See, <https://www.nesta.org.uk/blog/women-film-what-does-data-say>, Nesta and; Google (2017) 'The women missing from the silver screen and the technology used to find them.' Google. See, <https://www.google.com/about/main/gender-equality-films/>
37. Sleeman, C. (2016) The forgotten women of the Proms. 'The Long and Short.' See, <https://thelongandshort.org/society/forgotten-women-composers-of-the-proms>
38. Powell, J. et al., (2017) 'Brexit Report. The impact of leaving the EU on the UK's arts, creative industries and cultural education - and what should be done.' London: Creative Industries Federation.
39. Creative & Cultural Skills and English Heritage (2013) 'The Historic Environment and Cultural Heritage Skills Survey.' Purfleet: Creative & Cultural Skills.
40. Nordicity and Smith, A. (2017) 'Workforce Review of the UK Offstage Theatre and Performing Arts Sector.' London: UK Theatre and Society of London Theatre.
41. MTM (2017) 'Digital Culture 2017.' London: Nesta and Arts Council England.
42. Ibid.
43. Association of British Orchestras (2017) 'Brexit - The Impact on Orchestras.' London: ABO.
44. Windsor, G., Bakhshi, H. and Mateos-Garcia, J. (2016) 'Skilled Migration and the UK's Creative Industries.' London: Nesta.
45. Powell, J., Cauldwell-French, E. and Easton, E. (2017) 'Global Talent - Why the UK's world-leading creative industries need international workers and how to attract them.' London: Creative Industries Federation.
46. Bakhshi, H., Frey, C. and Osborne, M. (2015) 'Creativity vs Robots: the creative economy and the future of employment.' London: Nesta.
47. Bakhshi, H. et al., (2017) 'The Future of Skills: Employment in 2030.' London: Nesta, Oxford-Martin, Pearson.
48. Aoun, J. (2017) 'Robot-proof: higher education in the age of artificial intelligence.' Cambridge MA: MIT Press; Manyika, J. et al., (2017) 'Jobs Lost, Jobs Gained: workforce transitions in a time of automation.' McKinsey Global Institute; and World Economic Forum and BCG (2018) 'Towards a Reskilling Revolution: A future of jobs for all.' Cologne: World Economic Forum.
49. Occupations as described in the O*Net database (<https://www.onetonline.org/>)
50. Higgins, C. (2015) Turner prize winners Assemble: Art? We're more interested in plumbing. 'The Guardian.' <https://www.theguardian.com/artanddesign/2015/dec/08/assemble-turner-prize-architects-are-we-artists>
51. Creative People and Places (2017) 'Our Learning'. See, <http://www.creativepeopleplaces.org.uk/our-learning-tags/national-evaluation>
52. Easton, E. and Cauldwell-French, E. (2017) 'Creative Freelancers.' London: Creative Industries Federation.
53. For additional discussion see, Holden, J. (2015) 'The Ecology of Culture: A Report Commissioned by the Arts and Humanities Research Council's Cultural Value Project.' Swindon: AHRC.
54. Taylor, M. (2017) 'Good Work: The Taylor Review of Modern Working Practices.' London: BEIS.
55. UCAS (2017) 'June Deadline Analysis.' UCAS. See, <https://www.ucas.com/file/115931/download?token=n-dpq8pP>
56. HM Treasury (2015) 'Spending Review and Autumn Statement.' London: HM Treasury.
57. Creative Industries Federation (2017) Letter to Editor 'The Times.' See, <https://www.creativeindustriesfederation.com/publications/letter-sunday-times-folly-neglect-funding-creative-degrees>
58. RCA, The RCA Fund: FAQs. See, <https://www.rca.ac.uk/more/support-the-rca/rca-fund-1/frequently-asked-questions/>
59. Creative Industries Federation (2018) 'Response to MAC Consultation on International Students.' London: Creative Industries Federation.
60. Dempsey, N. (2016) 'Arts funding: statistics.' London: House of Commons Library and; Harvey, A. (2016) 'Funding arts and culture in a time of austerity.' London: New Local Government Network. Latter in financial year terms.
61. The latest forecast from the OBR is available at: <http://obr.uk/forecasts-in-depth/tax-by-tax-spend-by-spend/national-lottery/>
62. Visit England (2016) 'Visitor Attraction Trends in England 2016.' Basingstoke: Visit England.
63. Mayor of London (2015) 'Take a closer look, A cultural tourism vision for London 2015-2017.' London: Greater London Authority.
64. Employment in the official DCMS definition of the creative industries and creative occupations.

65. Bakhshi, H., Davies, J. and Higgs, P. (2015) 'The geography of the UK's creative and high-tech economies.' London: Nesta.
66. Mateos-Garca, J. and Bakhshi, H. (2016) 'The geography of creativity in the UK.' London: Nesta.
67. We Made That (2014) 'Artists' workspace study.' London: Greater London Authority.
68. Lima, A. and Davies J. (2017) 'The clubbing map.' London: Nesta.
69. Powell, J. et al., (2017) 'Brexit Report. The impact of leaving the EU on the UK's arts, creative industries and cultural education - and what should be done.' London: Creative Industries Federation.
70. Deloitte and Oxford Economics (2013) 'Tourism: jobs and growth.' Deloitte.
71. Visit Britain (2018) 'More international tourists visiting the nations and regions than ever before'. See, <https://www.visitbritain.org/more-international-tourists-visiting-nations-and-regions-ever>
72. Nesta (2018) Forthcoming report on repayable finance.
73. Baeck, P., Bone, J. and Mitchell, S. (2017) 'Matching the crowd.' London: Nesta.
74. Greenberg, J. (2016) Would you pay 25 cents to read an article? Blendle certainly thinks so. 'Wired.' See, <https://www.wired.com/2016/03/pay-25-cents-read-article-blendle-certainly-thinks/>
75. Anderson, A. (2014) Inside the Berlin Phil digital concert hall. 'International Arts Manager' 03 November 2014.
76. For instance, National Theatre's streaming service for schools 'On Demand. In Schools'. See, https://schools.nationaltheatre.org.uk/app/os#!on_demand/faqs-3
77. For details of this project see Eastmond, D. et al., (2015) 'Fire station Arts and Culture: Neo-ticketing.' Digital R&D fund for the Arts and the tumblr blog associated with the project <https://neoticketing.tumblr.com/>
78. Michaels, C. (2017) 'Museum business models in the digital economy'. See, <https://www.nesta.org.uk/blog/museum-business-models-digital-economy>
79. King's College (2015) 'The Art of Partnering Case study: SPINE.' London: King's College.
80. Nathan, M. (2017) 'Urban incubators, innovation and inequality.' Medium. See, <https://medium.com/@maxnathan/urban-incubators-innovation-inequality-a-new-research-agenda-24be2792049e>
81. MTM (2017) 'Digital Culture 2017.' London: Nesta and Arts Council England.
82. MTM (2017) 'Digital Culture 2017.' London: Nesta and Arts Council England.
83. Umbrellium (online) 'Assemblance: Collaborative Immersive Environment'. See, <http://umbrellium.co.uk/initiatives/assemblance/>
84. Cocks, A.S. (2018) How Google became a major producer of cultural content. 'The Art Newspaper.' See, <https://www.theartnewspaper.com/feature/how-google-became-a-major-producer-of-cultural-content>
85. MTM (2017) 'Digital Culture 2017: Museums.' London: Arts Council England and Nesta.
86. Yalcinkaya, G. (2017) 'New app Smartify functions as a "Shazam for the arts world"'. Dezeen. See, <https://www.dezeen.com/2017/10/08/new-app-smartify-hailed-shazam-art-world-technology/>
87. For more information see 'Museum in a Box' <http://www.museuminbox.org/who-is-it-for/> (accessed 25/02/18)
88. Google Cultural Institute (online) 'The Lab at the Cultural Institute'. See, <https://www.google.com/culturalinstitute/thelab/#intro>
89. Google Cultural Institute (online) 'X Degrees of Separation'. See, https://artsexperiments.withgoogle.com/xddegrees/8gHu5Z5RF4BsNg/BgHD_Fxb-V_K3A
90. Feldman, R. (2017) 'VR headsets more popular than tablets and wearables were at same stage.' YouGov. See, <https://yougov.co.uk/news/2017/05/19/vr-headsets-more-popular-tablets-and-wearables-wer/>
91. <http://subjectile.com/portfolio-items/amcb/?portfolioID=71>
92. Kelion, L. (2017) 'Snapchat exhibits virtual Jeff Koons sculptures.' BBC. See, <http://www.bbc.co.uk/news/technology-41497842>
93. Smith, R. (2017) How Artificial Intelligence Could Revolutionize Archival Museum Research. 'Smithsonian Magazine.' See, <https://www.smithsonianmag.com/smithsonian-institution/how-artificial-intelligence-could-revolutionize-museum-research-180967065>
94. Digital Meets Culture (2017) 'The National Gallery predicts the future with artificial intelligence'. See, <http://www.digitalmeetsculture.net/article/the-national-gallery-predicts-the-future-with-artificial-intelligence/>
95. Bezegová, E. et al., (2016) 'Virtual Reality and its Potential for Europe.' London: Ecorys.
96. Science Museum Group (online) 'Science Museum Group: Digital Lab, Experiments in Emerging Technologies and Visitor Experience'. See, <https://lab.sciencemuseum.org.uk/> and; National Theatre (online), 'Immersive Storytelling Studio'. See, <https://www.nationaltheatre.org.uk/immersive/studio>
97. Lithodimos VR (online) 'Case Studies'. See, <https://lithodimosvr.com/case-studies/>

98. Levy, S. (2017) The Race for AR Glasses Starts Now. 'Wired.' See, <https://www.wired.com/story/future-of-augmented-reality-2018/>
99. Hogan, M. (2017) 'Is Secretive Virtual Reality Startup Magic Leap Dreaming Up the Future of Music?' Pitchfork. See, <https://pitchfork.com/features/article/is-secretive-virtual-reality-startup-magic-leap-dreaming-up-the-future-of-music/>
100. Cieko, B. (2017) 'Examining the Impact of Artificial Intelligence in Museums.' Museums and the Web. See, <https://mw17.mwconf.org/paper/exploring-artificial-intelligence-in-museums/>
101. Center for the Future of Museums (2017) 'Trendswatch 2017.' American Alliance of Museums. See, <https://aamus.org/docs/default-source/center-for-the-future-of-museums/trendswatch-2017.pdf>
102. Tate (online) 'IK Prize'. See, <http://www.tate.org.uk/about-us/projects/ik-prize>
103. Dobrzynski, J. (2016) Artificial Intelligence as a Bridge for Art and Reality. 'New York Times.' See, <https://www.nytimes.com/2016/10/30/arts/design/artificial-intelligence-as-a-bridge-for-art-and-reality.html>
104. Akten, M. and Whatley, A. (online) 'Pattern Recognition.' Memo.tv. See, <http://www.memo.tv/pattern-recognition/>
105. Mann, Y. (online) 'AI Duet.' Experiments with Google. See, <https://experiments.withgoogle.com/ai/ai-duet>
106. MTM (2017) 'Digital Culture 2017.' London: Nesta and Arts Council England.
107. For example, in their report on cultural value for the Arts and Humanities Research Council, Crossick and Kaszynska note that "*the best for the most*" had been the slogan devised by the publicity manager at the Council for the Encouragement of Music and the Arts (CEMA), the Arts Council's forerunner. Crossick, G. and Kaszynska, P. (2016) 'Understanding the value of arts & culture: The AHRC Cultural Value Project.' Swindon: AHRC.
108. Bakhshi, H. and Lomas, E. (2017) 'Defining R&D for the Creative Industries.' London: Nesta.
109. Bakhshi, H. (2011) Learning from experiments. 'Arts Professional.' See, <https://www.artspromotional.co.uk/magazine/242/article/learning-experiments>
110. Examples include: Price, K. (2017) 'Family fun: the design secrets behind Secret Seekers.' V&A. See, <http://www.vam.ac.uk/blog/digital-media/family-fun-the-design-secrets-behind-secret-seekers> and; Cawston, R. (2017) 'Making Contact: Digital Experiments with Visitor Donations.' National Museums Scotland. See, <http://blog.nms.ac.uk/2017/07/27/making-contact-digital-experiments-with-visitor-donations/>
111. Arts Council England (2015) 'New programme supports artists working with technology.' Arts Council England. See, <http://www.artscouncil.org.uk/news/new-programme-supports-artists-working-technology>
112. AHRC (2017) 'Creative Industries Clusters Programme - Creative R&D Partnerships Call Launched.' AHRC. See, <http://www.ahrc.ac.uk/newsevents/news/industry-and-university-partnerships-to-power-a-creative-revolution/>
113. Biddle, M. (2017) 'Industrial Strategy Challenge Fund – more challenges, more opportunities.' Innovate UK. See, <https://innovateuk.blog.gov.uk/2017/11/30/industrial-strategy-challenge-fund-more-challenges-more-opportunities/>
114. Arts Council England and RSA (ed.) (2013) 'Towards Plan A: A new political economy for arts and culture.' London: Arts Council England.
115. Ellison, J. (2015) 'The Art of Partnering.' London: King's College London.
116. Doeser, J. (2015) 'The Drive to Partner.' in Ellison, J. (2015) 'The Art of Partnering.' London: King's College London.
117. See, for example, the Local Cultural Education Partnerships and Bridge Organisations, <http://www.artscouncil.org.uk/children-and-young-people/working-partnership>
118. AHRC (2017) 'Creative Industries Clusters Programme launched by Greg Clark at Bazalgette Review.' AHRC. See, <http://www.ahrc.ac.uk/newsevents/news/cicp-launch-greg-clark/>
119. See: <https://getnorth2018.com/> for information about Get North.
120. See: <http://covculture.com/overview/>
121. Ibid.
122. Neelands, J. et al., (2015) 'Enriching Britain: Culture, creativity and growth: The 2015 report by the Warwick Commission on the Future of Cultural Value.' Coventry: University of Warwick.
123. Bakhshi, H. and Throsby, D. (2010) 'Culture of Innovation: An economic analysis of innovation in arts and cultural organisations.' London: Nesta. Building on a framework proposed in McCarthy, K.F. and Jinnett, K. (2001) 'A New Framework for Building Participation in the Arts.' Santa Monica CA: Rand Corporation.



ARTS COUNCIL ENGLAND



nesta

58 Victoria Embankment
London EC4Y 0DS

+44 (0)20 7438 2500

information@nesta.org.uk

 [@nesta_uk](https://twitter.com/nesta_uk)

 www.facebook.com/nesta.uk

www.nesta.org.uk

Nesta is a registered charity in England and Wales with company number 7706036 and charity number 1144091.
Registered as a charity in Scotland number SCO42833. Registered office: 58 Victoria Embankment, London, EC4Y 0DS.

