Approaches to Measuring the (Economic) Value of the Immersive Arts in the UK

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Contents

Introduction

This paper examines how the economic value of the immersive arts sector and associated programmes and projects can be measured, recognising both the sectors growing importance and the challenges it presents for conventional analytical frameworks.

Immersive arts activity spans multiple domains (including creative production, digital technologies, and experiential design) and as such does not map neatly onto standard statistical classifications. At a macro level, existing studies have therefore tended to rely on tools such as the Standard Industrial Classification (SIC) and Standard Occupational Classification (SOC)[1] to approximate the sector's footprint. While these approaches provide a consistent and scalable basis for analysis, they also risk understating the true scale and complexity of immersive arts by fragmenting activity across industries and occupations and overlooking freelance, project-based, and emerging forms of work. This paper introduces such studies and explores best practice for using these types of frameworks and combining them with the microdata infrastructure which is now more freely available for academic and government researchers to access. As such, it provides an overview of the potential microdata sources that could be used to support such an evaluation.

The study also notes the additional value that can be added through triangulation with other data sources. It suggests that further insights could be achieved by combining data collected from the Immersive Arts: Joining the Dots programme mapping the UK's immersive infrastructure and ecosystems with firm-level data from Companies House and/or commercial datasets. Through inclusion of such an approach, researchers would be better able to establish a baseline view of business activity to capture this hybrid and fast-evolving creative activity.

At a more micro level, this paper also sets out a framework that combines multiple data sources and methods to provide a more comprehensive assessment of value delivered by Immersive Arts programmes and projects. It highlights collection of data in relation to four interrelated dimensions of economic impact: direct project effects, regional and place-based impacts, inclusive distributional outcomes, and longer-term sector development. combining incorporating web-based data (such as social media engagement, network reach, and media visibility) to capture dimensions of influence and impact that extend beyond traditional

[1] SIC codes classify companies by their primary business activity or industry such as retail or manufacturing, whereas SOC (Standard Occupational Classification) codes classify individual workers by their specific job roles such as accountants or plumbers.

economic metrics. As a compliment to more traditional economic indicators, it further recommends incorporating digital trace and web-scraped data to capture additional forms of value. It then demonstrates how this approach could be applied in practice by presenting a theoretical case study.

Overall the paper acknowledges that due to difficulties with definition and measurement there is no perfect solution, but by integrating a number of different approaches, the authors suggest that researchers will be able to develop a fuller and more nuanced understanding of the Immersive Arts sector and its programmes, one that reflects both their measurable economic contribution and their wider cultural and innovation impacts.

Measuring the Economic Value of the Immersive Arts Sector

Definition of immersive arts

To estimate the value of the immersive arts sector, the first challenge is to define it. However this is not without its challenges given that it can have different features for different audience (López-Rodríguez et al, 2024). Immersive Arts UK, however, specifically defines it as "art that uses technology to actively involve the audience". To break that down further, they note that this involves working with virtual, extended, and augmented realities to:

- Engage multiple senses
- Bridge the gaps between physical and digital spaces
- Connect people to each other and their environment
- Change the way we think and create

Essentially, this definition focuses heavily on the intersection of technology and active audience participation, aiming to break down barriers and disrupt established ways of creating and experiencing art.

More generally, immersive art is a genre of creative expression designed to break the "fourth wall" between the viewer and the artwork. Instead of simply looking at a piece on a wall, the audience enters the art itself, becoming a part of the environment. To be truly "immersive" an art installation usually hits several of these notes:

- Multi-Sensory Engagement: It doesn't just rely on sight. It often incorporates soundscapes, scents, touch, or even taste.
- 360-Degree Environment: The art surrounds the viewer, often filling an entire room or outdoor space so there is no "off-stage."
- Interactivity: The piece may change based on where you walk, how you move, or what you touch.
- Presence: The goal is to make the viewer lose their sense of the outside world and feel completely "present" within the artist's narrative.

Different types of immersive art include Virtual Reality (VR), Augmented Reality (AR), and projection mapping such as the Van Gogh immersive art exhibits, Mirror rooms such as Yayoi Kusama exhibits, massive textile installations, or walk-through sculptures, and immersive theatre where the audience moves through sets and interacts with actors.

Academically, there are several features and patterns to define immersive art. The first is that philosophical and phenomenological approaches often define immersive art by how it repositions the audience from a passive observer to an active inhabitant. From this perspective, immersive art is defined as artworks that produce holistic environments that the perceiver physically or virtually enters, and the essential characteristic is the experience of being "inside another world", which can be achieved through entirely physical spaces, digital virtual realities, or a hybrid of both (Mäcklin, 2021; Mathias, 2022).

The second is that scholars focusing on modern exhibitions and the experience economy tend to define immersive art through the lens of sensory stimulation and technological facilitation. For example, immersive art experiences are characterized by their ability to stimulate multiple senses simultaneously, often incorporating advanced technologies like Virtual Reality (VR) and Augmented Reality (AR) to evoke emotional responses and facilitate active engagement with the artwork (López-Rodríguez et al., 2024; Jalhed, 2025; Yu, 2022). As such, given these challenges with definition, measuring the size and the impact of the industry can be challenging.

Development of the immersive art sector in UK

The immersive art and entertainment industry in the UK has evolved from a niche, experimental sector into a multi-billion-pound pillar of the creative economy. As of 2026, the immersive art industry is now a highly sophisticated ecosystem blending the UK's world-class heritage in theatre, VFX, and gaming with cutting-edge Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR).

Market size and growth data

The UK is uniquely positioned as Europe's leading hub for immersive experiences, driven by a tech-savvy population, strong government backing for the creative industries, and London's status as a global cultural capital. According to Grand View Research (Jan 2026)[2], the UK immersive entertainment market generated a total value of $8.93 billion in 2025 and is projected

[2] https://www.grandviewresearch.com/horizon/outlook/immersive-entertainment-market/

to reach $68.5 billion by 2033, growing at a staggering Compound Annual Growth Rate (CAGR) of 29.9%. These figures were estimated by combining firm-level data from various databases including FAME, Beauhurst, corporate annual reports, UK Companies House filings, and press releases.

It is reported that the UK accounts for roughly 6.5% of the immersive technology global market and contributed 21.6% of Europe's total immersive entertainment revenue in 2025[3] (Mordor Intelligence, 2026). The UK houses over 2,100 immersive technology companies - an 83% growth over the preceding five years. The vast majority (80%) are agile micro-SMEs with fewer than ten employees[4] (Innovate UK Immersive Economy Report, 2022).

Global trends

The Art Newspaper (2026) published data of immersive art venues and museums globally, although it is unclear as to the methodology used to estimate this. They reported that the number of dedicated immersive art venues globally jumped from around 100 in 2019 to over 350 by the end of 2024[5], albeit the number of immersive art venues/sites in the UK was not revealed.

Experiential art museums specifically are projected to expand at a 27.15% CAGR across Europe through 2031. According to a report published by University of Birmingham, there are around 120 immersive art venues in the UK[6]. However, the market is currently experiencing a correction. A late-2025 report by the Gensler Research Institute noted that while the industry is booming, a flood of low-quality, AI-generated "cash grab" exhibitions has led to consumer fatigue. Success in the UK market now relies on high-fidelity, narrative-driven experiences rather than generic projection mapping. VR currently holds the largest revenue share in the UK due to widespread adoption in LBEs and gaming. However, Mixed Reality (MR) is the fastest-growing segment, expanding at a CAGR of over 30%, as it allows digital art to interact seamlessly with physical environments and audiences.

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[3] https://www.mordorintelligence.com/industry-reports/europe-immersive-entertainment-market
[4] https://iuk.immersivetechnetwork.org/wp-content/uploads/2022/10/Immersive-Economy-2022-final-13-Oct.pdf
[5] https://www.theartnewspaper.com/2025/01/29/the-second-wave-of-immersive-institutions-has-arrived
[6] https://www.birmingham.ac.uk/news/2024/a-network-for-the-immersive-experience-and-entertainment-industry

Sector drivers

Recent evaluations of UK Research and Innovation (UKRI) programmes[7] estimate that upwards of 43,000 people now identify as working within the UK's Creative Immersive Content sector – the data collection approach is documented in Table 1.

Table 1 Methodologies of UKRI Creative Immersive Content analysis

Evaluation approach	Details
Sector level analysis #2	Update on the experimental statistics benchmark, including analysis of the CCI immersive content vertical (skills, companies, public and private investments)
Wider market analysis	Mid-point review & update report on market analysis and current conditions, with a particular focus on the immersive content vertical in China.
Stakeholder consultations	Mix of focus groups and one-to-one interviews with stakeholders, assessing programme progress to-date, wider awareness, interest and linkages with the wider industry
Demonstrators	Check-in interviews with the Demonstrator leads and their partners. Interviews with the team at the Digital Catapult.
Post-exit survey for Design Foundation programme (G&I)	CATI post-exit survey to the Design Foundation companies (PIIC and IA will be surveyed in November 2021).

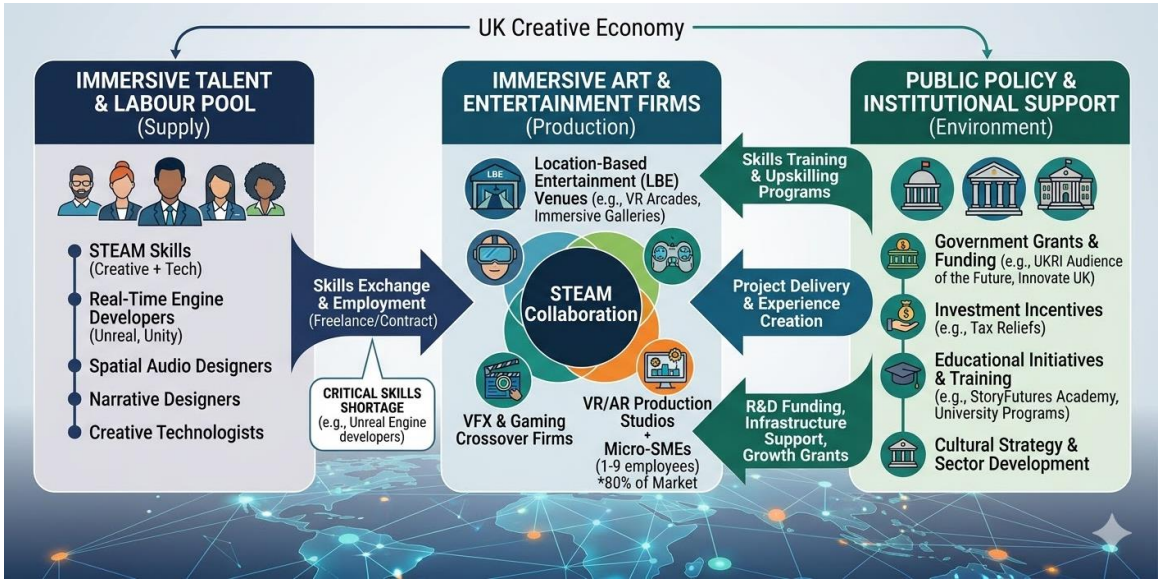
Source: UK Research and Innovation (UKRI) Creative Immersive Content Interim Report

The proportion of this workforce classified specifically as "tech-skilled" has surged by over 70% in recent years, which highlights a harsh reality that pure creative or design skills are increasingly insufficient without an underlying foundation in technology. Based on SIC codes belonging to Sectors R, J, and M, micro-SMEs dominate this market since around 80% of immersive companies in the UK employ between 1 and 9 people (Bureau van Dijk - FAME, 2026). Because the vast majority of studios are micro-SMEs, full-time, permanent employment is less common than in traditional tech sectors. The industry operates heavily on a project-by-project basis, relying on freelance contractors to scale up for major installations or exhibitions and scaling down once the project is delivered. In terms of spatial allocation, London continues to dominate this market, accounting for roughly 61% of the total workforce (Marra & Baldassari, 2022).

[7] https://www.ukri.org/wp-content/uploads/2023/10/UKRI-18102023-ISCF-Audience-of-the-Future-Interim-report-210226_final.pdf

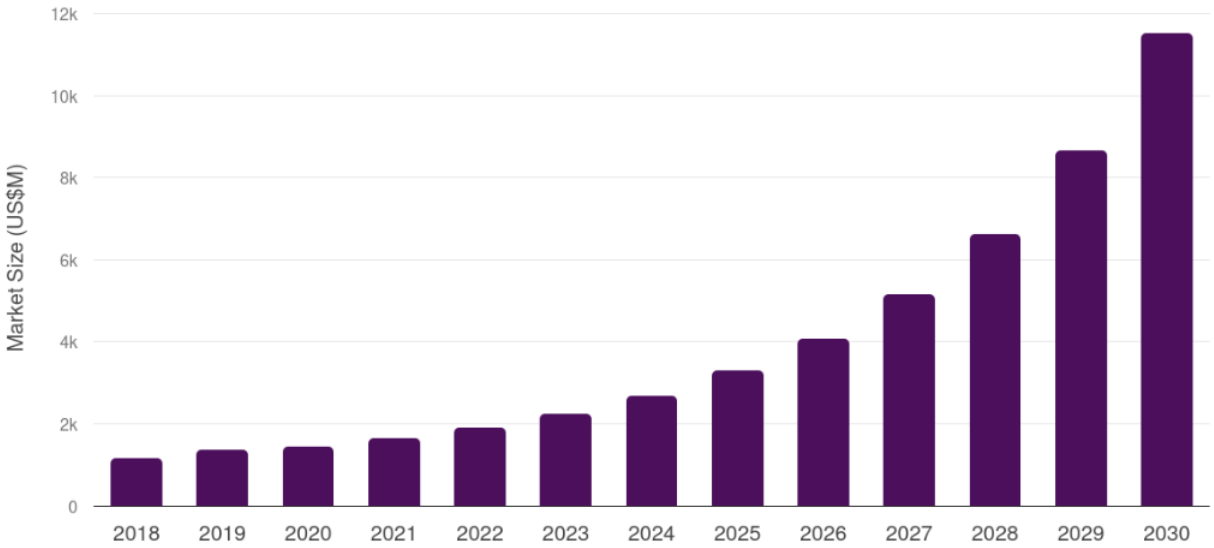
However, when looking at the concentration of immersive jobs relative to the local population, cities like Brighton and Hove, Oxford, Cambridge, and Sheffield are critical hubs for immersive talent.

Figure 1 Diagram of ecosystem of immersive art industry



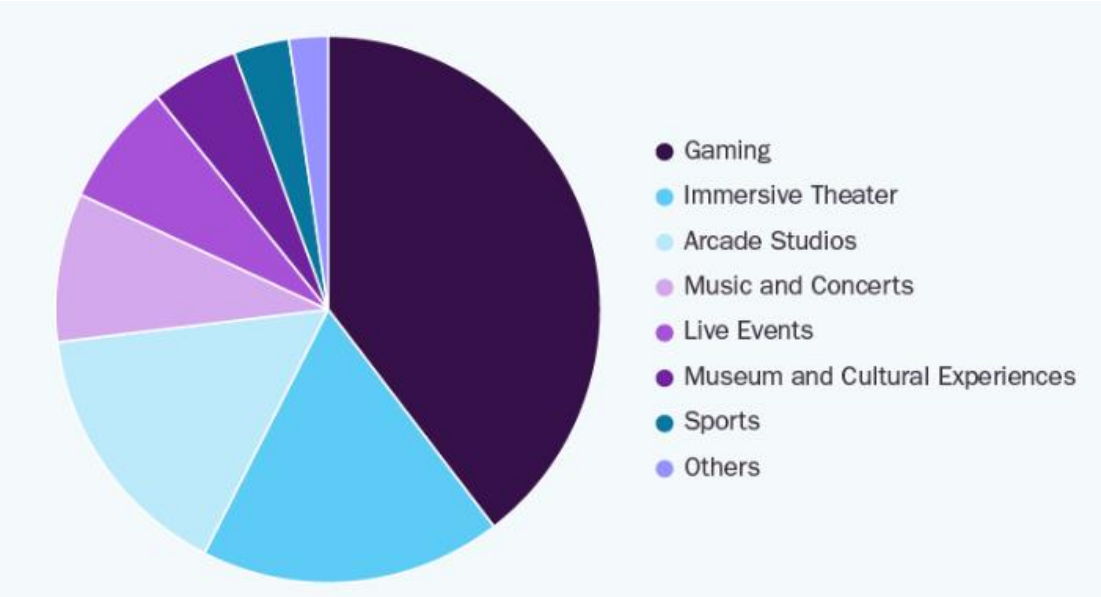
Source: Authors' mapping based on literature and produced using Gemini.

Figure 2 Market size of immersive art industry in the UK (2018-2030)



Source: Grand View Research database of immersive art industry in the UK based on FAME database and the institution's projection[8].

Figure 3 Main components of immersive art industry in the UK (2025)



Source: Grand View Research database of immersive art industry in the UK based on FAME database[9].

Data and methodology

In terms of considering potential approaches and potential data sources that are useful in understanding the economic value of the immersive arts sector there are three main dimensions which can be considered - labour (talent), firms, and institutions. Some examples of the different data sources available are as follows:

(1) Labour (talent). Examples of datasets that could be used to explore this issue include HESA Higher Education Student Statistics database for higher-education graduates majoring in related majors and industry sector and occupation information from the ONS's employment and earnings surveys (e.g. Labour Force Survey, Annual Survey of Hours and Earnings)

(2) Firms: Examples of sources of data that include Creative Industries Sector Economic Estimates by ONS and Department for Culture, Media and Sport (DCMS), corporate estimates by various consulting companies, FAME database, Beauhurst database, and

[8] https://www.grandviewresearch.com/horizon/outlook/immersive-entertainment-market/uk
[9] https://www.grandviewresearch.com/industry-analysis/immersive-entertainment-market-report

ONS datasets including Annual Business Survey for firm-level data of value creation, corporate structure, fundraising, and other business patterns.

(3) Institutions: Examples include UK, regional and local guidance and strategy reports of creative industries in general and immersive arts in particular.

In terms of methodological approaches, some broad-based approaches can be applied. Some examples are as follows:

(1) Retrieving open-access data from NOMIS such as Business Register and Employment Survey (BRES) data and UK Business Counts dataset for national and regional overview of immersive art and creative industry (data collection skills required – limited to SIC and SOC analysis).

(2) Selecting micro-level authorisation-required data from ONS's and other Government Data held in Trusted Research Environments such as ONS's Secure Research Service (secure data authorisation required; computer coding skills required, again limited by SIC And SOC analysis – e.g. Stata).

(3) Using Companies House data or private sector data (e.g. FAME) to explore the performance of companies operating in immersive art and creative industry by local authority and sector (financial and business structure literacy skills required. Combining this companies based approach with the mapping work of the UK's immersive infrastructure and ecosystems undertaking as part of the Immersive Arts: Joining the dots programme, may be extremely helpful, albeit we recognise Companies House/Fame data sources will be limited to companies, so poor coverage of freelancers and project-based work).

(4) Collecting information about related national and regional public policies from policy brief and reports (web scraping skills required).

(5) Producing descriptive statistics and contextual information – e.g. demographics of related employees and students (gender, education, age, ethnicity, experience, etc), business performance of related firms (total assets, turnover, profit, number of employees, fundraising, etc), and relevant public policies (Creative Industries Sector Plan 2026, West of England Growth Strategy 2025, UK Creative Industry Strategy 2022, etc).

(6) Mapping historical trends and current status of immersive art and creative industry nationally, regionally and by local authority (ArcGIS mapping skills required).

(7) Correlation and causation analysis – e.g. undertaking cross sectional and time-series multivariate regression analysis - the reality is that the production of simple correlation and descriptives may be more appropriate, as genuine causal claims require careful design and rich data which is challenging to generate for a sector which is hard to define and accurately measure (modelling skills required).

SIC and SOC codes of the immersive arts

The use of SIC and SOC codes to measure the immersive arts sector can be problematic. For example, Immersive Arts is fast-evolving sector and largely consists of project-based activities, which SIC and Soc codes were not designed to capture. The main limitations relate to three main challenges - conceptual (there is no clear definition of the immersive arts sector), measurement (activity is fragmented across industry and occupation), and practical (there is a primary activity bias with the SIC (and SOC) codes with it only capturing the main registered activity of a firm or task within an individual's job, while the immersive art work maybe a small but growing activity in a firm and an individual's role.

Regardless of these challenges, and due to the fact that nationally and regionally the most comprehensive data collected on both firm and individual activity is largely captured using SIC and SOC codes, researchers have attempted to apply such an approach to better understand the immersive arts sector.

Following a review of a variety of published research papers, market reports, and policy guidebooks, the research team have identified several relevant key SIC and SOC codes previously used to identify the immersive art sector.

(1) SIC codes

To measure the output of immersive art studios, agencies, and cultural institutions, researchers aggregate data from a blend of the IT, design, and cultural sectors:

- Sector R: Arts, Entertainment and Recreation
    - 90.03 (Artistic creation): Captures independent artists, sculptors, and digital creators producing the core artistic IP.
    - 90.01 (Performing arts): Frequently used for immersive theatre, live interactive installations, and location-based VR experiences.

    - 91.02 (Museum activities): Covers cultural institutions incorporating AR/VR for interactive exhibitions and digital heritage displays.

- Sector J: Information and Communication
    - 62.01 (Computer programming activities): Captures the technical backbone of the industry, including studios building the code, game engines (like Unity or Unreal), and interactive platforms required for VR/AR art.
    - 59.11 (Motion picture, video and television programme production activities): Often covers studios engaged in 360-degree video production, volumetric video, and virtual production.
- Sector M: Professional, Scientific and Technical Activities
    - 74.10 (Specialised design activities): A common "catch-all" code used by digital agencies doing 3D modelling, interactive design, and immersive world-building.
    - 71.11 (Architectural activities): Frequently leveraged by firms performing spatial computing and designing virtual environments.

(2) SOC codes

Immersive art requires fusion skills (Moon et al., 2024), a tight blend of deep technical know-how and creative vision. Labour market reports track the following occupational codes to measure the workforce:

- 2137 (Web and multimedia design professionals): Crucial for UX/UI designers who build the interfaces and interactive elements of AR/VR art.
- 2136 (Programmers and software development professionals): The developers and technical artists writing the scripts that make immersive environments responsive and interactive.
- 3411 (Artists): The traditional code for fine artists, which is continually expanding in scope to include digital and virtual reality artists.
- 3412 (Authors, writers and translators): Relevant for narrative designers creating non-linear, interactive storytelling scripts for immersive experiences.

- 3421 (Graphic designers): Professionals creating the 2D assets, textures, and visual elements for immersive projects.

It is unclear as to how well these SIC and SOC codes capture the Immersive Arts sector. As such, we would recommend a fuller analysis be undertaken to explore whether the latest version of the SIC and SOC codes (e.g. UK SIC codes were revised and updated in 2026) are better placed to more accurately capture the Immersive Arts sector.

Using microdata to better understand the immersive arts sector.

While acknowledging the limitations of using SIC and SOC codes in analysis of the immersive arts sector, given their foundations in the national statistical framework, use of such an approach opens access to several different data surveys. Many of these surveys are available as microdata sets for accredited researchers to access and link in trusted research environments, which opens a set of analytical possibilities that are simply not feasible with published or aggregated statistics. For researchers, it fundamentally changes both the depth and credibility of analysis.

Microdata

Microdata refers to data recorded at the level of individual units (such as people, jobs, or firms) rather than aggregated summaries. Each record in a microdata set contains detailed information about a specific observation, for example an individual's earnings, occupation, and demographic characteristics, or a firm's employment, turnover, and industry classification. This level of granularity allows researchers to examine variation within populations, explore relationships between characteristics and outcomes, and undertake robust statistical analysis. In the UK context, datasets such as the Annual Survey of Hours and Earnings (ASHE) provide job-level microdata that underpin much of the analysis of pay and labour market dynamics. Due to the sensitive nature of such detailed information, access to microdata is controlled and provided through secure environments to ensure confidentiality while enabling high-quality research.

Microdata Access

In the UK, one of the primary routes is via ONS's Secure Research Service (SRS), which provides access to detailed survey and administrative datasets under strict governance arrangements. Researchers may also access microdata through other Trusted Research Environments (TREs) operated by government departments (e.g. HMRC). Some less sensitive microdata (typically anonymised survey extracts) can be accessed via services such as the UK Data Service, although

these versions often have reduced detail. Overall, access is designed to balance the analytical value of microdata with the need to protect the privacy and confidentiality of individuals and organisations.

Microdata analysis

While acknowledging the limitations identified using SIC and SOC coding, the use of microdata could still provide a powerful basis for understanding the (partial) economic impact of the immersive arts sector by enabling analysis at the level of individual workers, jobs, and firms. It would be possible for researchers to examine earnings, job quality, and occupational structures associated with immersive arts activity, while linked administrative sources (e.g. HMRC PAYE data) allow for insights into employment dynamics and workforce composition over time.

By applying filters based on SIC and SOC codes, it would be possible to approximate the footprint of (a partial) immersive arts across industries and occupations, and to compare outcomes (such as pay, productivity, and job stability) with other sectors. Importantly, microdata also enables more advanced analytical approaches to distinguish between compositional effects (e.g. workforce characteristics) and underlying economic performance. While classification challenges remain, it could also be possible (subject to UK Statistical Authority's Research Accreditation Panel approval) to combine microdata with supplementary sources (such as firm-level and digital trace data) allows for a more nuanced and evidence-based assessment of the sector's economic contribution.

Microdata sources

A range of data sources can be used to understand the immersive arts sector, although no single dataset captures it comprehensively. Traditional survey-based microdata, such as the Annual Survey of Hours and Earnings (ASHE) and the Annual Population Survey (APS), provide detailed information on earnings, employment, and workforce characteristics, which can be used (via Standard Industrial Classification (SIC) and Standard Occupational Classification (SOC) codes) to approximate the sector's labour market footprint. These can be complemented by administrative datasets, including HMRC PAYE Real Time Information, which offer more timely and granular insights into employment dynamics. On the firm side, business registers such as Companies House and commercial databases (e.g. FAME) provide information on firm structure, financial performance, and growth. Beyond these conventional sources, newer forms of data (such as web-scraped information, social media metrics, job advertisements, and network data) are increasingly valuable for capturing aspects of immersive arts activity that are not well

reflected in official statistics, including audience reach, innovation, and emerging skill demands. Taken together, these sources support a mixed-methods approach that combines robust economic measurement with a broader understanding of the sector's cultural and digital presence.

Review of microdata sources

In this section we briefly identify several current and forthcoming datasets which are available in the UK which could be used to better understand the Immersive Arts Sectors. A brief overview of the datasets is given in Appendix 1.

Annual Survey of Hours and Earnings (ASHE)

The Annual Survey of Hours and Earnings (ASHE) is one of the UK's main sources of detailed information on employee pay and hours worked. This dataset contains key variables, including individual, firm and geographic identifiers, but is only available under restricted access via the Office for National Statistics Secure Research Service (SRS).

The ASHE dataset provides detailed annual information on employee earnings, occupations and industries for approximately 1% of Pay-As-You-Earn (PAYE) jobs in the UK - see Forth et al. (2025 for further detail. It includes anonymised individual and firm identifiers, SIC and SOC codes, as well as local authority identifiers, making it well suited to longitudinal and spatial analysis. Its panel structure enables researchers to track individuals over time, providing valuable insights into job transitions, pay progression and regional labour market dynamics.

ASHE is particularly valuable for job-level analysis due to its high-quality earnings data and detailed occupation and industry coding. By linking individuals to firms and local areas, it enables nuanced comparisons of jobs, particularly in relation to wage differentials. However, a key limitation is the exclusion of the self-employed, which constrains its coverage of the wider labour market.

ASHE Linked to Census 2011

The ASHE-Census 2011 linked dataset combines the rich earnings and employment information available in ASHE with the detailed demographic and socio-economic data from the 2011 Census. This dataset is accessible via the ONS's Secure Research Service (SRS). It enables researchers to examine how individual characteristics (such as education, ethnicity and housing

tenure) relate to earnings, occupation and industry over time. The ASHE component retains its core features, including annual frequency, coverage of approximately 1% of PAYE employee jobs, longitudinal identifiers, and detailed SIC and SOC coding, alongside local authority information.

For immersive arts analysis, this dataset is particularly valuable as it allows for a nuanced understanding of who is working in the immersive arts sector, how much they are paid, who they work for and what socio-demographic factors may influence access to or outcomes within the immersive arts sector. Its strengths include the ability to analyse inequality, mobility, and representation in the immersive arts sector across different social groups. However, limitations include the fact that Census data are from a single year (2011), so time-varying demographic updates are not available, albeit fixed and semi-fixed characteristics can be allocated across all years of the ASHE dataset. In addition, the Wage and employment Dynamics project (see https://www.wagedynamics.com/) are current working with ONS to release an ASHE-Census 2021 linked dataset.

Annual Population Survey (APS)

The APS combines data from the Labour Force Survey (LFS) and local area boosts to provide large-sample annual estimates of labour market and socio-economic characteristics across the UK. It includes detailed information on employment status, occupation (SOC), industry (SIC), education, and demographics, and is available with longitudinal elements in the SRS, though primarily treated as repeated cross-sections. It also includes geographical identifiers down to local authority level under secure access.

For immersive arts analysis, APS offers broad coverage and good regional detail, making it useful for understanding the distribution of immersive arts across different population groups and areas. Its strengths lie in population coverage and sociodemographic depth, but limitations include lower earnings precision (compared to ASHE) and exclusion of firm-level identifiers.

Labour Force Survey (LFS)

The LFS is a quarterly household survey providing detailed data on employment, unemployment, occupation, industry, hours, and demographics. It is a rotating panel survey with up to five waves per individual, allowing short-term longitudinal analysis. It includes SOC and SIC codes and some local geography under secure access, but no firm-level data or direct environmental indicators. It also has a smaller sample size when compared to other labour market surveys such as ASHE.

For immersive arts analysis, the LFS supports high-frequency monitoring and transitions in and out of immersive arts occupations using SOC/SIC proxies. It is particularly useful for exploring employment trends and workforce characteristics. However, like APS, it lacks wage precision and firm-level context.

Understanding Society: UK Household Longitudinal Survey

Understanding Society is a longitudinal household panel study tracking individuals annually on a wide range of topics including employment, income, education, health, and environmental attitudes. It includes occupation and industry codes (SOC/SIC), individual and household identifiers, and allows for rich longitudinal analysis over time.

Its value for immersive arts analysis lies in its depth of personal, attitudinal, and household-level information, allowing researchers to examine how values, wellbeing, and work conditions intersect with immersive arts employment. However, the main weaknesses are its smaller sample size, less frequent wage updates, and reliance on self-reported data, with limited direct industry indicators or firm-level detail.

Annual Business Survey (ABS)

The ABS provides structural business statistics for the non-financial business economy, including turnover, costs, employment, and capital expenditure. It is conducted annually and includes SIC industry codes and firm identifiers under secure access, but not employee-level data or occupational classifications.

For immersive arts analysis, the ABS is useful for analysing the structure and performance of immersive arts companies based on SIC classification. Its strengths lie in measuring sectoral economic contribution and firm characteristics. However, it does not contain individual-level job data.

Registration and Population Interactive Database (RAPID)

The RAPID dataset is a UK population-based administrative dataset created from records held by the Department for Work and Pensions and HMRC. It contains de-identified records for all people with a National Insurance number who were alive on or after 6 April 2010, with annual coverage from 2010/11 to 2023/24 (ADR UK, 2026). It brings together information on employment, benefits and pensions, including employment income, self-employment profit, benefit income and pension income. This makes it particularly valuable for analysing labour

market participation, earnings progression, economic inactivity and transitions between employment and benefits over time. Because it is based on 100% extracts from administrative systems, it also offers strong potential for detailed analysis by age, sex, local authority and derived monthly economic activity.

For research on sectors such as immersive arts, RAPID could provide a powerful way of examining employment and income trajectories, particularly where individuals move between employment, self-employment and benefit receipt. It could help researchers understand patterns of attachment to paid work, earnings volatility, and the extent to which workers experience periods of low income or interaction with the welfare system. However, it also has important limitations. The dataset does not include individual employment detail, hours worked, education activity, qualifications or ethnicity, and it is not designed to identify specific creative occupations or immersive arts activity directly. As such, RAPID is best understood as a valuable labour market and income dataset that would need to be combined with other sources or carefully linked classification strategies to study the immersive arts sector in detail.

Linked Employer and Employee Database (LEED)

The Economic Statistics Centre of Excellence set up a project to develop a roadmap for a new UK linked employer–employee dataset (LEED), arguing that linking workers to firms over time would provide a much richer understanding of labour market dynamics than analysing businesses or individuals separately (Forth et al., 2025).

The proposed approach centres on building a “data spine” by linking HMRC PAYE Real Time Information with business data, enabling the tracking of workers and firms longitudinally and the production of new indicators on job flows, pay progression and earnings dynamics.

Although not currently available, the Economic and Social Research Council and Administrative Data UK are currently commissioning a project to make a fully Linked Employer Employee Database available in trusted research environments. When available, it will allow researchers to study labour market outcomes from both sides of the employment relationship, rather than looking at workers or firms in isolation. It will enable researchers can be used to track workers and firms over time, supporting analysis of hiring, separations, job-to-job flows, earnings inequality, earnings volatility and the “human side” of productivity. In the UK, existing LEED resources remain limited, and ESCoE argues that there is a major opportunity to build a more comprehensive infrastructure around HMRC PAYE Real Time Information data, which covers almost all employee jobs, is longitudinal, regularly updated and linkable to other datasets.

For research on sectors such as immersive arts, LEED would provide a powerful way to examine how firms, jobs and workers interact over time. It could help researchers analyse whether workers in immersive arts experience different earnings trajectories, job stability, mobility, or progression compared with workers in related creative, digital or cultural sectors. It could also support analysis of firm-level outcomes, such as whether firms with particular workforce structures grow more quickly, pay higher wages, or experience higher staff turnover. However, LEED would not automatically solve the problem of defining immersive arts, since the sector may still be difficult to identify through standard SIC and SOC codes alone. Its value would therefore be greatest when combined with careful sector classification, additional administrative or survey data, and potentially web-based or qualitative evidence to identify firms and workers involved in immersive arts activity.

Potential Approaches to Evaluating the Economic Impact of Immersive Arts Projects and Programmes

Given the challenges with using microdata sets, it is our assessment that any economic evaluation of Immersive Arts programmes should adopt a mixed-method, multi-level framework that captures both immediate project-level outcomes and wider ecosystem effects. Immersive Arts is not simply a funding mechanism for discrete creative outputs; rather, it operates as a UK-wide research and development programme designed to support artists, develop skills, expand audiences, and build long-term sector capacity (University of the West of England, 2025a). As such, a narrow return-on-investment model would risk underestimating its broader economic and cultural value.

A robust evaluation should therefore distinguish between four interrelated dimensions of economic impact: direct project effects, regional and place-based impacts, inclusive distributional outcomes, and longer-term sector development.

Direct economic impacts

The first dimension concerns direct funded-project impacts, including artist fees, freelance employment, contractor expenditure, venue hire, technology costs, and marketing spend. In addition, evaluation should capture any generated income streams such as ticket sales, commissions, licensing, touring revenue, and follow-on investment.

These indicators provide a baseline measure of the immediate economic activity generated by the programme and are consistent with established approaches to evaluating creative industries interventions (UNCTAD and UNDP, 2010).

Regional and place-based economic impacts

The second dimension focuses on regional and local economic impacts. Given the geographic distribution of Immersive Arts funding, it is essential to distinguish between where organisations are registered and where activity takes place. Immersive arts projects are often mobile, interdisciplinary, and distributed, meaning that production, exhibition, and audience engagement may occur in different locations.

Evaluation should therefore analyse:

- the registered location of funded organisations,
- the location of production activity,
- the location of exhibition or delivery, and

the geographic distribution of audiences.

This approach allows for a more accurate understanding of how funding contributes to local economies and whether it supports the diffusion of creative activity beyond established cultural hubs. This is particularly important given evidence that immersive arts currently lack robust and scalable exhibition and distribution infrastructure, which constrains sector growth (Densley, Abba and McIntosh, 2025).

Inclusive and distributive impacts

A third dimension concerns inclusive and distributive impacts, particularly in relation to place-based inequality. The evaluation should examine whether funded activity reaches areas with historically lower levels of cultural and technological investment.

This can be achieved by mapping:

- artist and organisational locations,
- production and delivery sites, and
- audience engagement locations

against measures such as the Index of Multiple Deprivation (IMD), rural–urban classifications, and existing cultural infrastructure.

Such analysis moves beyond simply identifying where funding is allocated, enabling an assessment of who benefits and whether the programme contributes to widening participation and levelling access to immersive arts practice.

Supply chain and input–output analysis

A fourth component should focus on supply chain mapping and expenditure flows. Immersive arts projects typically draw on complex, hybrid supply chains involving creative, technical, and production roles, including developers, designers, fabricators, sound engineers, and venue partners.

Data collection should capture:

- supplier type and location,
- contract value,
- whether suppliers are newly engaged, and
- whether expenditure is retained locally or leaks outside the region.

This enables estimation of local economic multipliers and spillover effects. Input–output modelling may then be used to estimate indirect and induced impacts, although this should be applied cautiously. As widely noted in cultural economics, such models can overstate impacts if not grounded in robust empirical data (Howkins, 2002). It is therefore recommended that modelled effects are clearly distinguished from observed direct impacts. It is worthy of note, however, that the Brunel Centre has recently developed a regional input-output model which may be appropriate for this type of analysis (https://www.thebrunelcentre.co.uk/)

Sector development and longer-term impacts

Beyond immediate outputs, the evaluation should capture longer-term sector development effects, including skills development, network formation, and innovation capacity. Evidence suggests that immersive sectors face significant skills shortages, particularly in areas such as real-time engines and creative-technical integration, which can constrain growth (Immersive UK, 2023).

Immersive Arts funding may therefore generate value by strengthening workforce capability, supporting interdisciplinary collaboration, and enabling projects to transition toward sustainable business models.

A longitudinal component (12–24 months post-project) should track:

- follow-on funding and commissions,
- touring and exhibition opportunities,
- licensing and distribution agreements,
- business formation or growth, and
- sustained employment or freelance activity.

This is particularly important given evidence that immersive artworks often struggle to reach audiences due to gaps in distribution infrastructure, even when critically successful (Densley, Abba and McIntosh, 2025).

Triangulating business data with digital trace data

To complement traditional economic indicators, the evaluation should incorporate digital trace and web-scraped data to capture forms of value specific to immersive arts.

Network and social media traction

Metrics such as engagement rates, audience growth, and network connections can provide insight into visibility and influence. Immersive experiences are often designed to encourage sharing and participation, making digital engagement a meaningful proxy for impact (Leung, Buhalis and Viglia, 2024).

Reach and media awareness

Web scraping of press coverage, festival listings, and cultural platforms can help assess public awareness and critical reception. This reflects the role of immersive arts in shaping audience attention and cultural visibility.

Labour market signals

Analysis of job advertisements and skill demand (e.g. XR, Unity, Unreal Engine) can provide evidence of alignment between funded activity and emerging labour market needs, particularly within the broader creative and knowledge economy (Ortiz-Ospino et al., 2025).

Market and investment trends

Tracking mentions across innovation programmes, accelerators, and industry reports can identify emerging areas of investment and technological development within immersive sectors.

Conceptual framing

Taken together, this approach positions Immersive Arts as a creative R&D ecosystem rather than a conventional arts funding programme. This is supported by three key insights from the literature.

First, immersive technologies are associated with significant growth potential within the creative economy, driven by innovation, digital content expansion, and new modes of cultural production (Ortiz-Ospino et al., 2025).

Second, the sector is constrained by underdeveloped exhibition and distribution networks, meaning that economic value depends not only on production but on ecosystem development (Densley, Abba and McIntosh, 2025).

Third, immersive experiences generate value through engagement, presence, and interaction, which influence user satisfaction and behavioural outcomes, and therefore have economic relevance beyond traditional metrics (Chang and Suh, 2025; Leung, Buhalis and Viglia, 2024).

In summary, the economic evaluation of Immersive Arts should integrate direct financial analysis with regional mapping, supply chain tracking, deprivation-sensitive place analysis, and digital trace data. This approach enables a comprehensive understanding of how public funding supports individual artists while also strengthening local economies, expanding access, stimulating innovation, and contributing to the long-term development of a sustainable and inclusive immersive arts ecosystem (University of the West of England, 2025a).

This is a great case to anchor the method—it's place-based, participatory, and visually/sonically rich, which makes it ideal for demonstrating how social media impact links to economic pathways.

Example application: Social media impact analysis of *Phanto Spectra*

To demonstrate the application of digital trace data within the economic evaluation framework, this section outlines a proposed approach using the Immersive Arts-funded project *Phanto Spectra* by Martin Joseph O'Neill (The Stove Network), delivered in Dumfries, Scotland (University of the West of England, 2025a).

Phanto Spectra is an immersive, site-specific audio-visual performance transforming Dumfries' riverbanks through sound, light, and storytelling, drawing on the histories of Scotland's Travelling Showpeople. Its combination of community narratives, place-based delivery, and sensory experience makes it particularly suitable for analysing digital engagement and its relationship to economic impact.

Digital footprint mapping

The first stage of analysis would identify the project's distributed digital presence, recognising that immersive arts projects often operate across networks rather than a single platform.

- For *Phanto Spectra*, this would include:

- the lead organisation: The Stove Network,
- the artist: Martin Joseph O'Neill,
- project-specific naming ("Phanto Spectra"),
- local partners (e.g. Dumfries-based cultural organisations),
- funding body amplification (Immersive Arts programme partners),
- venue/location tags (Dumfries riverbanks),
- thematic hashtags (e.g. #immersiveart, #Dumfries, #XRart, #site-specificperformance).

This mapping establishes the ecosystem of actors, which is critical given that value in creative and cultural industries (CCIs) is often generated through networked interactions rather than isolated outputs (Ortiz-Ospino et al., 2025).

Data collection framework

Data would be collected across four time periods:

- T0 (pre-funding/announcement): baseline digital presence,
- T1 (announcement and promotion): initial visibility spike,
- T2 (delivery/performance): peak engagement phase,
- T3 (post-project): sustained attention and legacy effects.

Sources would include:

- Instagram, TikTok, X, LinkedIn, YouTube,
- press coverage and local media,
- event listings and cultural platforms,
- user-generated content (UGC), including audience posts.

This longitudinal approach enables analysis of how attention builds, peaks, and dissipates, rather than relying on static metrics.

Analytical dimensions

Reach and visibility

Metrics:

- number of posts mentioning *Phanto Spectra*,

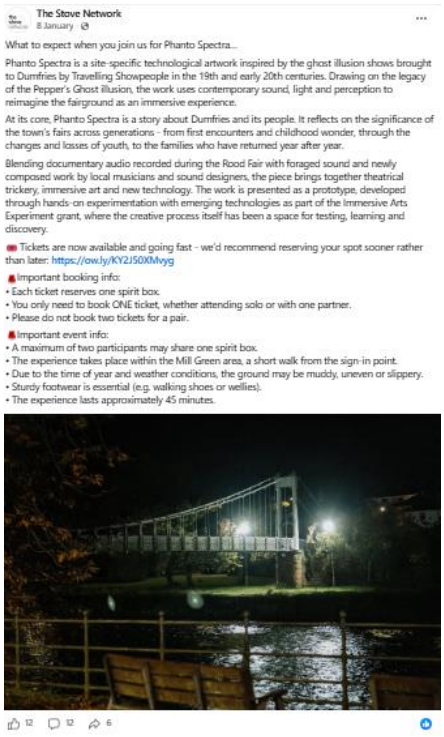
- hashtag frequency (#PhantoSpectra, #Dumfries, etc.),
- audience reach/impressions (where available),
- follower growth of The Stove Network during the project window.

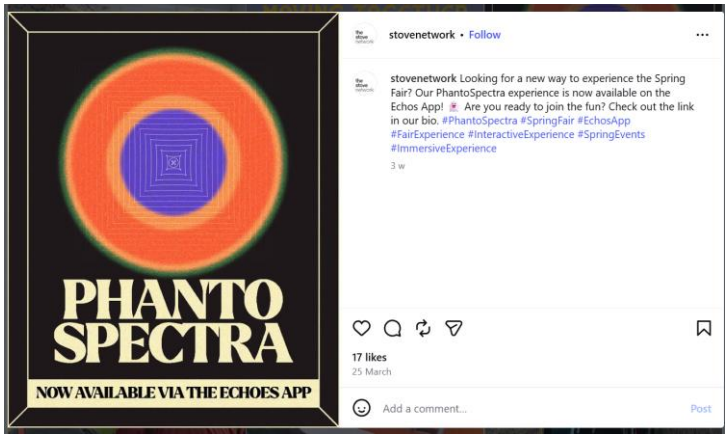
Given the site-specific nature of the project, reach may extend beyond Dumfries, demonstrating how local cultural activity generates visibility.

Engagement and interaction

Metrics:

- likes, comments, shares, saves,
- engagement rate (relative to follower base),
- video engagement (completion rates, replays),
- volume of audience-generated content.





Immersive experiences are designed to elicit strong sensory and emotional responses, which are associated with higher engagement and participation (Leung, Buhalis and Viglia, 2024). In this case, audience responses to soundscapes, lighting, and storytelling may be particularly visible in qualitative posts and reactions.

Network amplification

This stage examines who is talking about the project.

Metrics:

- number of unique accounts posting,
- institutional amplification (e.g. arts organisations, funders, festivals),
- influencer or media engagement,
- repost chains and collaboration networks.

For *Phanto Spectra*, particular attention could be paid to:

- local cultural networks in Dumfries,
- Scottish arts organisations,
- heritage and community organisations

This analysis reveals how the project contributes to ecosystem connectivity, which is critical in a sector characterised by fragmented distribution pathways (Densley, Abba and McIntosh, 2025).

Audience geography

Where data permits, analysis would examine:

- geotagged posts,

- location metadata,
- language and inferred audience location.

This is particularly valuable when linked to regional analysis, allowing comparison between:

- the physical delivery site (Dumfries), and
- the spatial distribution of digital attention.

Such analysis can demonstrate how localised cultural investment generates wider geographic impact, a key consideration in place-based funding. We might propose for future funded projects that they begin to collect user data and feedback to help them deliver these insights.

Sentiment and discourse analysis

Qualitative analysis would examine:

- audience sentiment (positive/negative/neutral),
- thematic content (e.g. “heritage”, “innovation”, “community”, “spectacle”),
- references to accessibility, inclusion, or local identity.

This is especially important given that immersive cultural experiences can generate strong affective responses, but may also raise questions about meaning, accessibility, or interpretation (Zhao, Xie and Song, 2025).

Example outputs

The analysis could produce several outputs:

A. Temporal engagement profile

A timeline showing peaks in activity corresponding to:

- funding announcement,
- promotional campaigns,
- live performances,
- media coverage.

B. Network visualisation

A map of relationships between:

- artist,
- organisation,
- audiences,
- media and cultural institutions.

C. Engagement typology

Distinguishing between:

- passive reach (views, impressions),
- active engagement (comments, shares),
- participatory engagement (user-generated content).

D. Geographic diffusion map

Comparing:

- physical project location (Dumfries),
- audience distribution (where the audience predominately people local to Dumfries or were they visitors to the area).

Linking social media impact to economic outcomes

The critical analytical step is linking digital engagement to economic value. For *Phanto Spectra*, social media data can be interpreted as an indicator of several economic pathways.

First, it acts as a signal of market demand, indicating audience interest that may translate into future ticket sales, commissions, or touring opportunities.

Second, it contributes to reputational capital for the artist and organisation, increasing visibility within professional networks and enabling access to future funding or partnerships. This is particularly important in immersive arts, where distribution often relies on informal networks and relationships (Densley, Abba and McIntosh, 2025).

Third, it supports place-based economic value, by promoting Dumfries as a site of cultural innovation and potentially contributing to cultural tourism and local engagement.

Fourth, it contributes to sector development, by expanding awareness of immersive arts practices and building new audiences within the wider creative economy (Ortiz-Ospino et al., 2025).

Using *Phanto Spectra* as an illustrative case, the evaluation will incorporate analysis of social media and digital trace data to assess the visibility, engagement, and network effects generated by funded projects. Data will be collected across multiple platforms over defined time periods and analysed in relation to reach, engagement, amplification, audience geography, and sentiment. This approach enables the identification of how projects generate attention, build audiences, and signal future market potential. In the context of immersive arts where value is often realised through networks, visibility, and audience engagement these indicators provide a meaningful proxy for downstream economic outcomes, including commissions, partnerships, and regional cultural impact.

Conclusion

This paper demonstrates that while the immersive arts sector resists straightforward measurement using conventional frameworks, it is precisely this hybridity that necessitates a more flexible and integrated analytical approach. Reliance on standard classifications such as SIC and SOC codes, while useful for consistency and comparability, is insufficient on its own to capture the full scope of activity, particularly given the prevalence of freelance work, cross-sector collaboration, and rapidly evolving forms of digital and experiential production. By drawing on emerging microdata infrastructures and linking these to firm-level and programme-level evidence, the study shows how researchers can move towards a more grounded and empirically robust understanding of the sector.

The paper further highlights the importance of triangulation, combining administrative data, commercial datasets, and digital trace data to capture both the economic footprint and the broader influence of immersive arts activity. This includes not only direct economic contributions, but also place-based impacts, distributional outcomes, and longer-term ecosystem development. In doing so, it sets out a practical framework that can be adapted to different contexts and policy needs, while remaining sensitive to the sector's inherent complexity.

Ultimately, the approach advanced in this paper supports a more comprehensive and policy-relevant assessment of value, one that aligns with wider objectives around inclusive growth, innovation, and regional development. While measurement challenges will remain, the integration of multiple data sources and methods offers a clear pathway for improving evidence, enabling policymakers, funders, and researchers to better understand, support, and sustain the immersive arts sector as it continues to evolve.

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