

National
Theatre

Theatre
transformed:
harnessing
research,
development
and innovation

Contents

Foreword from Indhu Rubasingham & Kate Varah	03
01. Executive summary	04
02. Definitions	10
03. What RD&I are theatres doing now?	14
04. What are the next frontiers for RD&I in theatre?	23
05. What support do theatres receive, and why is there a gap?	27
06. Policy recommendations	33
07. Conclusions	36
End notes	37
Appendix	40

Foreword from Indhu Rubasingham & Kate Varah

Theatremakers are the original innovators. Since medieval times, theatre in the UK has constantly reinvented itself and brought new ideas to the public – from the Mystery Plays that told stories to people in language they could understand; to the works of William Shakespeare, credited with inventing over 1,700 new words; through the melodramas and political theatre that gave voice to social change; to the immersive and cross-disciplinary performances that we now see on our stages.

Today, the sector's spirit of experimentation is as alive as ever. This research, commissioned by the National Theatre with support from Arts Council England and the Arts and Humanities Research Council, shows how research, development and innovation (RD&I) are already embedded in the practice of the artists, technicians, producers and educators who take risks every day to explore new ways of making and sharing work. Whether harnessing AI and immersive technologies, rethinking sustainable materials and touring models, or developing new approaches to audience engagement and business resilience, theatres across the UK (including the National Theatre) are pioneering ideas with the power to shape not only the performing arts but also wider culture and industry.

However, in the face of profound societal shifts – from changing audience behaviours and the rise of new technologies, to diminishing funding mechanisms and escalating social and environmental challenges – the sector must be further enabled to innovate in ways that no single theatre can achieve alone. In return, the industry – already global leading and returning huge economic and social dividends – has an as-yet untapped ability to help to address some of the most significant challenges the UK faces, from stagnating productivity to the youth mental health crisis.

The Government recognises that public investment in innovation is a key lever to support sectors to increase their economic and social impact and yet, compared to other areas of the economy, theatre's innovation potential remains under-recognised and under-supported by national policy.

With UKRI soon to publish a new strategy for the creative industries, now is the moment for government, funders, the theatre sector and researchers to work together to unlock theatre's full innovation potential. Our research shows that greater investment from government and its funding agencies, coupled with deeper partnerships between theatres, researchers and the wider creative industries, could enable the kind of interdisciplinary research and systemic innovation needed to meet this century's challenges.

By bringing together analysis with insight from across the sector, this research demonstrates that the theatre sector has the potential to become a living laboratory. We hope that its recommendations are the first step to making that vision a reality.

Indhu Rubasingham
Co-Chief Executive and Artistic Director, National Theatre

Kate Varah
Co-Chief Executive and Executive Director, National Theatre

01.

Executive summary

Executive summary

The UK theatre sector – from the Garrison Theatre in the Shetland Islands to the Minack Theatre in Cornwall – is a core part of our national life.¹ At last count, it contributed £2.39 billion in annual GVA, with a turnover of £4.44 billion; it is popular with domestic audiences, with more than one in five (22%) of the UK population attending the theatre in the past three months; and it is genuinely world-leading – in 2024, West End theatres attracted nearly five million more audience members than Broadway theatres.²

This success has been built on a long history of experimentation and innovation – from the development of miracle plays in the 14th century, to the new technologies, genres and approaches that are explored in the case studies in this report. Yet, despite this history, theatre has been largely overlooked in today's policy conversations on research, development and innovation (RD&I) – even though RD&I investment has been shown to deliver enormous returns. According to the Department for Science, Innovation and Technology's (DSIT) recent analysis, every £1 of civil public R&D investment generates an average of £8 in net economic benefit for the UK over the long term (not including important additional benefits in health, security, environment, and quality of life).³ There are also risks if the sector isn't fully emboldened to innovate – in the face of economic strain, changing audience behaviours, and technological acceleration, the theatre sector's capacity to take greater risks, and explore new horizons of RD&I will determine its future resilience.

This paper, commissioned by the National Theatre, with support from Arts Council England and the Arts and Humanities Research Council, aims to address that gap – mapping how RD&I already operates across the sector, assessing the mechanisms currently supporting it, and identifying future frontiers and policy actions to unlock its full potential.

Defining and identifying RD&I in theatre

The Government, funders and the sector use different definitions of research, development and innovation. For this work, RD&I in theatre is defined in line with the UK Government as *'the creation and application of new knowledge to improve the world'* – with a focus on activity that is 'new to market' rather than merely 'new to organisation'.⁴ The research identifies five overlapping forms of innovation that commonly take place in the theatre sector:

- **Artistic innovation:**
Developing new and experimental creative forms, genres and cross-disciplinary practices.
- **Technical innovation:**
The adaption or development of technologies such as immersive tools, use of artificial intelligence (AI) by creatives, digital platforms and advances in stagecraft.
- **Audience-engagement innovation:**
Developing participation models to reach new audiences or deepen relationships.
- **Organisational innovation:**
Building new types of business, governance and partnership approaches and models that strengthen sustainability and resilience.
- **Research:**
Generating new insights through practice – based or other forms of inquiry – both academic and non-academic – to inform creative output and organisational development.

Drawing on insight from across the National Theatre and wider theatre ecosystem, the paper then sets out a taxonomy showing that all five of these types of RD&I are embedded throughout and beyond the production cycle – from idea generation and development to production to legacy – as well as in organisational approaches to areas like skills and sustainability.

Future frontiers for RD&I in theatre

Informed by conversations with leaders from industry, policy and academia, our research highlights the four principal drivers that will shape the direction of theatre RD&I over the next decade – audiences, the sector itself, new technologies, and policy ambitions. By looking across these we can identify some of the most exciting potential areas for future investment, which include:

- 1. Marketing, audience insight and engagement:**
Developing data-led tools, dynamic pricing and shared sector initiatives to reach diverse audiences and reduce costs.
- 2. New forms and formats:**
Supporting interdisciplinary R&D into bold, hybrid and immersive work that merges live performance with other media to engage changing audiences.
- 3. Theatretech:**
Piloting automation, robotics, and digital infrastructure through testbeds linking venues, suppliers and researchers.
- 4. Materials and reuse:**
Supporting interdisciplinary R&D into material use and AI-enabled cataloguing in order to advance sustainable production and circular design.
- 5. Innovation for a global marketplace:**
Enabling R&D into productions that merge physical and digital practice, strengthening UK creative exports.

Current support and gaps

While both publicly funded and commercial theatres finance much of their own RD&I, public investment is essential to unlocking more capacity to not just innovate, but to address the systemic challenges and opportunities identified in this research.

Over the past decade, targeted funding from UKRI (particularly through AHRC and Innovate UK) has helped to support some transformative RD&I in the theatre sector. The arts councils have shown themselves to be increasingly essential in supporting innovation of all kinds in the publicly funded theatre sector, but particularly in supporting artistic innovation – Arts Council England's *National Lottery Project Grants*, for example, directly support research and development projects. Trusts and foundations have also looked to directly support RD&I activity in the arts. Bloomberg Philanthropies, for example, has invested \$128 million since 2021 to support digital innovation, diffusion and adaptation across the sector through its *Digital Accelerator Programme*.

However, the sector's potential for RD&I continues to be undermined by the overall level of UK government investment, including that delivered through three of its most significant innovation levers:

- **UKRI's investment in the creative industries** has grown, yet performing arts organisations remain under-represented. Only one UK theatre – the Royal Shakespeare Company – currently holds Independent Research Organisation (IRO) status. And while UKRI investment has funded many projects that benefit the performing arts, our research reveals theatres themselves are rarely directly involved – just over 1 in 100 (1.2%) theatre-related projects worth more than £100,000 have had a theatre as a lead partner and just over 1 in 10 (11.3%) included a theatre as a project partner.
- **R&D tax relief** is used very rarely by the sector, in part because it applies only to advances in science or technology, excluding most artistic R&D. Even where there is potential to use the relief, there is limited clarity for the sector on where technical R&D does qualify for tax incentives and how it works alongside other tax incentives.
- The Government has made a number of interventions to improve technology diffusion, which have included the work of the **SME Digital Adoption Taskforce** and the **Tech Adoption Review**. But these were not designed with the sector in mind, and awareness is low among theatres struggling with staff retention and significant digital skills gaps. Smaller theatres and those outside of London are even less likely to be able to take advantage of these opportunities.

Policy recommendations

Realising the full economic and social potential of theatre will demand a collective effort from Government, UKRI, the sector and from those in the wider ecosystem, including researchers. Our recommendations to support a substantial increase in the amount of RD&I in the theatre sector are (in brief):

For UK Government

- **Embed the performing arts in innovation policy:**
Recognise performing arts RD&I as a driver of economic, social and environmental value.
- **Clarify and align tax incentives:**
Ensure R&D tax relief and theatre tax relief complement each other and provide clear HMRC guidance for the sector.
- **Support AI and digital adoption:**
Identify theatres experimenting creatively with AI and celebrate them as trailblazers, working with the Department for Business and Trade (DBT) to lead a targeted awareness campaign tailored to sector needs, whilst recognising sector concerns around the use of creative works to train AI and its environmental impact.⁵
- **Implement the Technology Adoption Review:**
Government departments should partner with industry to establish CreaTech demonstration hubs in theatres, to support peer-to-peer networks and to improve skills and training.

For UK Research and Innovation (UKRI)

- **Recognise theatre as a driver of innovation:**
Reflect this in the forthcoming *UKRI Creative Industries Strategy*.
- **Invest in new systemic RD&I programmes for theatre:**
Innovate UK, working with other funding councils, should investigate dedicated funding streams for areas including marketing, audience insight and engagement; new genres and forms; TheatreTech; materials and reuse; and innovation in a global marketplace.
- **Encourage an increase in participation from arts organisations in interdisciplinary initiatives:**
Including CoSTAR and the forthcoming *Creative Content Exchange*, set out in the *Creative Industries Sector Plan*.⁶

For the Theatre Sector (non-profit, commercial and Independent)

- **Develop a performing arts cluster:**
Collaborate on a cross-sector bid to the AHRC *Creative Industries Cluster Programme* (next round opens January 2026 with further opportunities in subsequent years).
- **Build research leadership:**
Identify organisations best placed to apply for Independent Research Organisation (IRO) status, and pool resources to build capacity.

Case study:

Sonia Friedman Productions

Location: London, England

Type of innovation: **Technical innovation and artistic innovation**

Sonia Friedman Productions' stage adaptation of *Paddington the Musical* required a multi-year programme of R&D to translate one of the UK's most beloved characters into a live theatrical form.

The project was driven by two core motivations: the importance of *Paddington*'s underlying theme of empathy in an increasingly divided world, and the recognition of the opportunity – as well as the responsibility – in adapting one of the most internationally beloved intellectual properties to the stage.

The central RD&I challenge was determining how Paddington himself should appear on stage. With multiple emotionally and commercially invested stakeholders – from the Bond family, to StudioCanal, to the general public – the show's success depended on finding the most convincing and sustainable approach. After 18 months of exploratory workshops, the team landed on a dual-performer model: one performer inside the suit, and a second remotely operating and voicing the bear. However, in order to bring the bear to life, a series of complex technical and performance challenges remained.

While dual-operation techniques are already used in film, achieving this degree of synchronicity in live theatre – including singing, emotional nuance and real-time responsiveness – had never been attempted. The costume also needed to be comfortable and durable enough for repeated performances each week, and the animatronics had to operate flawlessly to avoid breaking the audience's suspension of disbelief. Over three additional years of R&D, the team undertook iterative technical development, carefully balancing performer comfort with aesthetic detail. Experienced costumier and technologist Tarha Zafar was brought in to lead on the costume and mechanism, with changes required up until opening night.

The performers themselves were also a core part of the R&D process: Arti Shah adapting her film-based experience to sustained live physicalisation, and James Hameed

For Future Research

- **Map and analyse RD&I in the arts:**
Expand collaboration between research institutions and cultural organisations (e.g. Serpentine, British Council, ACE).⁷
- **Evolve definitions of RD&I for the arts:**
Broaden frameworks in policy and tax to better capture artistic innovation; explore definitions of ‘theatre innovation’.

We also recommend that delivering better support for RD&I across the theatre sector will require the core funders – including UK Government, UKRI, the arts councils, commercial investors, and trusts and foundations – to work together to align their remits and identify opportunities where coordinated action can achieve greater collective impact.

mastering the vocal and technical operation of the bear using camera-based sightlines. Script adjustments were also needed to ensure the suit could be worn safely and sustainably for appropriate amounts of time.

Such long-term R&D requires significant investment (something which few production companies can realistically provide) and is high risk even with – and sometimes particularly with – well-known IPs. Yet the rewards can be huge – in this case a new, adaptable form of live puppetry-meets-automation with potential applications across immersive entertainment and future theatrical works, as well as the magic of bringing such a beloved story to the stage.

Acknowledgements

We are incredibly grateful to the large number of experts from inside and outside the theatre sector who have given their guidance on this report and its contents. We wish to particularly thank our advisory group and academic network, whose insights have been invaluable. However, it is important to note that these individuals are not responsible for the contents of the paper, including its recommendations, and any mistakes are the author's own.

With particular thanks to:

Tom Adeyoola
Innovate UK

Professor Hasan Bakhshi
Creative Industries Policy and Evidence
Centre

Matthew Byam Shaw
Playful Productions

Tao-Tao Chang
Arts and Humanities Research Council
(AHRC)

Professor Andrew Chitty
Loughborough University

Rachel Coldicutt
Careful Industries

Rishi Coupland
British Film Institute (BFI)

Ross Burnett
Arts Council England

Sarah Ellis
Royal Shakespeare Company

Jane Finnis
The Audience Agency

Sonia Friedman
Sonia Friedman Productions

Professor Haidy Geismar
University College London

Kristina Glushkova
University College London

Patrick Gracey
Patrick Gracey Productions

Nema Hart
Arts Council England

Professor Graham Hitchen
Loughborough University

Catherine Kerfoot
Arts and Humanities Research Council
(AHRC)

Professor Anthony Lilley
Scenario Two

Eleanor Lloyd
Eleanor Lloyd Productions

Tonya Nelson
Arts Council England

Professor Helen Nicholson
Royal Holloway, University of London

Jacqui O'Hanlon
Royal Shakespeare Company

Ramin Sabi
Ramin Sabi Productions

Professor Christopher Smith
Arts and Humanities Research Council
(AHRC)

Paul Smith
Middle Child Theatre

Professor Gregory Thompson
University College London

Alexandra Vincent
University of Oxford

Professor Ben Walmsley
University of Leeds

Kay Watson
Serpentine

Matt Woodhead
LUNG

Definitions

Research, development and innovation (RD&I)

There is no single definition of research and development (R&D) or innovation. Both Government and the theatre sector use the terms frequently, yet even within their own contexts there is no shared meaning. For example, when the Government says it wants to increase the amount they spend on innovation, they are referring to investment across a number of different levers, each operating in very different ways.⁸ Equally – as this paper will explore – in theatre, R&D and innovation are terms used to describe both major technological shifts and everyday creative practices.

A key challenge for this paper is therefore to find an approach that captures the ambitions of the theatre sector while also aligning with the priorities of Government and other stakeholders – and to identify the middle of the Venn diagram, where both sides can recognise opportunity.

Policy definitions

Increasing investment in innovation – including R&D – is a central ambition of the UK Government, as set out in the Modern Industrial Strategy.⁹ In pursuing this ambition, the Government has defined research and innovation (R&I) as *'the creation and application of new knowledge to improve the world'*.¹⁰

One of the main public levers for research and innovation is UKRI, the UK's non-departmental public body responsible for directing research and innovation funding. The approach to R&I in UKRI's 2022-2027 Strategy has much in common with the Government's outcome-focused approach, stating that *'research and innovation enrich and improve lives and increase prosperity by creating, applying and delivering value from new knowledge and ideas'*.¹¹ Similarly, its website has highlighted the national mission to *'invest in research and innovation to enrich lives, drive economic growth, and create jobs and high-quality public services across the UK'* and recently has started to use the tagline *'advancing knowledge, improving lives, driving growth'* to distill its focus for a public audience.¹² Under these broad definitions, UKRI supports projects across disciplines and sectors.

This emphasis on economic growth is underpinned by recent analysis by the Department for Science, Innovation and Technology (DSIT) which showed R&D's enormous potential returns: they found every £1 of civil public R&D investment generates an average of £8 in net economic benefits for the UK over the long term (which does not include important additional benefits in health, security, environment, and quality of life).¹³

Another critical lever is R&D tax relief, administered by HMRC. For tax purposes, HMRC applies a much narrower definition, focused on science and technology:

'R&D for tax purposes takes place when a project seeks to achieve an advance in science or technology. The activities which directly contribute to achieving this advance in science or technology through the resolution of scientific or technological uncertainty are R&D'.¹⁴

Both UKRI and, to a greater extent, HMRC's approach to R&D reflects the OECD's Frascati Manual – the most widely used international standard for R&D. Its latest edition defines R&D as:

'Creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge'.¹⁵

It further distinguishes between:

- **Basic research:**
Undertaken primarily to acquire new knowledge without a particular application in mind.
- **Applied research:**
Directed towards a specific, practical aim or objective.
- **Experimental development:**
Systematic work aimed at producing new products or processes, or improving existing ones.¹⁶

For some years, critics have argued that this framing – and particularly how it has been applied to UK R&D tax relief – may exclude many of the most significant forms of innovation within the creative industries, including the opportunities offered by interdisciplinary research. Since 2017, Hasan Bakhshi and Elizabeth Lomas have called for revisions to the *Frascati Manual* to better reflect arts and humanities research, both essential to the wider creative sector.¹⁷ The Council for Science and Technology also expressed support for broadening the definition of R&D eligible for tax relief in an open letter to the Prime Minister in 2023.¹⁸

Theatre perspectives

In the theatre sector, R&D has been used far more broadly. A recent compendium of essays on R&D in British Theatre describes it variously as:

- *'the coming together with other people to dream and hope about what the show could be'*
- *'the difference between the idea that you've got and the next thing it could become'*
- *'an open period when almost anything related to the initial inkling could be on the table'*
- *'a porous space that resists linear thinking'.¹⁹*

The breadth of how R&D and innovation are understood in theatre means it can be challenging to align the sector's approach with policy definitions. In theatre, these terms encompass everything from experimental, open-ended exploration to the adaptation of established processes from other fields. While policymakers tend to link RD&I to specific, measurable outcomes, theatre practitioners often use these terms to describe the pursuit of artistic discovery and collective imagination – activities that, by their nature, resist fixed objectives or quantifiable results.

Definition in this research

One of the core purposes of this research is to feed directly into an emerging government agenda around R&D and innovation – including an upcoming *UKRI Creative Industries Strategy*.

Whilst we strongly support the emerging academic, industry and policy conversations about the need to adapt the definitions of RD&I to better reflect and suit the needs of the arts, humanities and social sciences, in this report we are therefore taking a pragmatic and situational approach to definitions.

We therefore define RD&I in theatre in line with the UK Government's definition: *'the creation and application of new knowledge to improve the world'*. Our emphasis is on innovation practices that drive cultural, social, sectoral, or economic change, and are 'new-to-market' rather than 'new-to-organisation'.

More specifically, we are building on earlier research by Hasan Bakhshi and David Throsby (2009) which provided a taxonomy of cultural innovation and we are focussing on five areas of innovation which both happen regularly within theatres already and have the strongest potential to align with UK Government objectives.²⁰

These are:

- 1. Artistic innovation:**
The core of innovation in cultural organisations, this refers to the development and evolution of an artform itself, through the encouragement of new and experimental work, including those which brings to light new creative forms, genres, and cross-disciplinary practices.²¹
- 2. Technical innovation:**
The process of applying scientific and technical knowledge to introduce new technologies or significantly improve existing ones. In the cultural context, this could include immersive technologies, AI tools, digital platforms, or advances in stagecraft and production that enhance artistic practice, efficiency, or audience experience.
- 3. Audience-engagement innovation:**
New approaches to building, deepening, and diversifying relationships with audiences. This may include novel participation models, use of data and digital tools to personalise experiences, or new forms of co-creation including with audiences or community engagement (including work with schools) that broaden cultural access and relevance.
- 4. Organisational innovation:**
Changes in governance, management, or business models that allow organisations to become more sustainable, adaptable, diverse and effective. Examples include new financing mechanisms, new approaches to cross-sector partnerships, innovative governance structures, or agile operational practices that strengthen resilience and impact.
- 5. Research:**
The generation of new insights through practice-based or other forms of inquiry – both academic and non-academic – that inform creative output or organisational development. This may include artist-led research in theatres and universities, interdisciplinary collaborations with universities, evaluations of audience behaviour, and research projects that strengthen the evidence base for social and cultural impact and innovation.

When considering tax incentives, our primary focus will be on technical innovation, as it aligns most directly with HMRC's definition.

Of course, many RD&I interventions – as illustrated by the case studies in this report – bring together several of these forms of innovation into multi – or interdisciplinary activity. Theatre, in particular, has its own distinctive approaches to innovation, including ensemble working and a focus on improvisation, which integrate artistic, organisational, and audience-engagement innovation. While these practices can often be understood within the existing categories, there is a case for future debate about whether these approaches could be recognised as distinct forms of 'theatre thinking/innovation' in their own right.²² The process of theatre creation could also be examined as a unique area of research and experimentation: for instance, a recent collaboration between UCL and Flute Theatre used wearable brain imaging technologies to capture brain activity patterns while actors performed Shakespeare, allowing them to investigate the distinctive cognitive processes underpinning theatrical creation.²³

The theatre sector

For the purposes of this work, the theatre sector is defined as the ecosystem of businesses, organisations, and individuals whose primary focus is the creation, production, and presentation of theatrical performances – both within traditional theatre buildings and in other performance spaces. Reflecting the approach of the UK Government’s *Industrial Strategy*, our research focuses on the businesses, organisations and the workforce operating across both the funded and commercial parts of the sector. Where learning and participation activities are led by the theatre sector, they are included within the scope of our work. However, we do not examine the wider drama education ecosystem (for example, drama provision in schools, universities, and other formal education settings).

We recognise the importance of theatre as a practice in a range of contexts, including in education, health and conflict resolution – however, this wider use lies beyond the focus of this study. Likewise, although voluntary and amateur theatre play an essential role in the broader cultural ecosystem, they fall outside the scope of this research.

03.

**What RD&I are
theatres doing
now?**

RD&I in the theatre ecology

The theatre ecology is diverse, encompassing non-profit and commercial organisations, public-private partnerships, co-productions, building-based and building-less companies, groups specialising in particular forms of work and the freelancers who form the bedrock of the sector's workforce. Approaches to RD&I are therefore equally varied. While it is impossible to capture every way in which theatre organisations and practitioners engage in RD&I, understanding how to expand such activity requires us to look behind the curtain and begin to draw light on some of the most common ways the sector already invests in research, development and innovation.

This section does exactly that. Drawing on insights from departments from across the National Theatre, together with contributions from external theatre professionals and academic partners, it provides an initial picture of some of the many ways RD&I, defined in line with the UK Government as '*the creation and application of new knowledge to improve the world*,' is already embedded within and beyond the production cycle.²⁴

How RD&I feature as part of artistic development and production

Idea generation:

Artistic development begins with the creative idea, prompt or story for a performance, play or musical. Some productions are borne out of existing creative work (which could range from *Romeo & Juliet* to *Stranger Things*); others are the result of ideation and experimentation, by either an individual or a group of collaborators in pursuit of new ideas or forms. Innovation at this stage might include:

- **Artistic innovation:** Which takes place as emerging themes, contexts, and storytelling forms are explored across different artform disciplines, alongside new artistic approaches and collaborative methods. British theatre company Punchdrunk, for example, has established new methods through which they can co-create narratives with schoolchildren within bespoke immersive environments – an approach they are now introducing to international markets, including Australia.²⁵
- **Research:** Writers and creators may draw on historical contexts, literary works, social issues, social research, theatrical archives, or wider cultural themes as sources of inspiration. In turn, their work can contribute to the evidence base in these areas. For example, Alecky Blythe's *London Road* and Gillian Slovo's *Grenfell: In the Words of Survivors* both use collected verbatim interviews to shape the theatrical form while also generating valuable evidence of people's lived experiences of major historical events.²⁶
- **Technical innovation:** Which can include development or new applications of technical tools (e.g. digital archives, collaboration platforms, binaural sound, video) to inform the early concept.

Case study: Scenario Two

Location: London, England and Belfast, Northern Ireland

Type of innovation: Technical innovation and artistic innovation

Scenario Two is a theatre production company founded by John Berry and Anthony Lilley. Following acclaimed productions including *Into the Woods*, *The Light in the Piazza*, and (new work) *The Parent Agency*, the company formally announced in 2023 that work had begun on the commercially funded *Pavarotti Project*. Having secured the support of Nicoletta Mantovani, Luciano Pavarotti's widow, Scenario Two gained access to the singer's personal archives – including letters, recordings, and film footage – to ensure artistic and historical authenticity.

From the outset, the project demanded major technical innovation. A core ambition is to use Pavarotti's voice through AI-enabled sound design, allowing audiences to hear the maestro's own voice in harmony with live performances of new arrangements by multiple Grammy-winning UK artist and technical innovator, Jacob Collier. This pioneering work, led in partnership with Dr Ben Bloomberg at the Massachusetts Institute of Technology (MIT), involves isolating and reconstructing vocal elements from archival recordings so they can be integrated seamlessly into live soundscapes. Still in development, this represents a high-risk, high-reward innovation with potential applications well beyond the theatre sector.

A second strand of R&D has focused on integrating screen-based technologies into the productions bringing to life the creative vision of director, Michael Gracey (*The Greatest Showman*, *Better Man*) whose background in visual effects is central to the project. To achieve this, the production has drawn on the facilities of Studio Ulster, home of the CoSTAR Screen Lab – a leading centre for research in virtual production and real-time performance. Access to this infrastructure is enabling the team to explore new workflows for the creation of live performance including the use of 3D game engines in creation and visualisation, virtual humans performing in harmony with live

Development:

At this stage the idea is expanded and refined into a production-ready form. Innovation at this stage may include:

- **Artistic innovation:**
The development process could be said to illustrate innovation in practice, as feedback and experimentation drive improvements. Scripts and devised pieces often go through multiple iterations and workshops, including informal readings, trial performances, and iterative work on design, sound, music, and live technologies. At this stage the creators are able to explore narrative, character, and staging in collaboration with directors, dramaturgs, designers, choreographers, and actors – often leading to new and experimental work, and even entirely new creative forms and genres. Development may be led by an individual artist, an organisation, or be part of a co-production partnership between theatres.
- **Audience-engagement innovation:**
Which involves consulting cultural experts, sector peers, and specific audience groups to find new ways to inform and shape creative work. For example, over the past three decades the National Theatre's *Connections* programme has pioneered methods for co-creating new work with young people, who are involved in shaping scripts from the development stage.²⁷
- **Technical innovation:**
Which could involve developing new technologies, or applying existing technologies in new ways, either to enhance storytelling, support with casting or to improve access and meet the needs of the production team.

Production (rehearsal and preparation):

Once a play is green-lit, a production team brings it to life. This production stage includes casting and contracting actors and creative teams, designing sets, costumes, lighting, sound, video, choreography/movement and rehearsal of the performance. Ahead of moving to the theatre, 'pre-visualisations' are developed, with lighting and automation used on 3D models to help visualise the final product. Key forms of innovation at this stage include:

- **Technical innovation:**
This might be an innovative approach to a traditional form, like the puppetry used in the National Theatre's production of *War Horse*, or the involvement or development of multimedia elements (projections, digital sound and lighting) to enhance storytelling. Designers and technical crews may need to engage in R&D to work out how they can implement new stage technologies or special effects.
- **Organisational innovation:**
This is where companies might adopt new project management and creative processes to coordinate artists and technical staff or approaches to making and building sets, props and costumes.³⁰ For instance, sustainable production practices or cross-venue co-productions might be tried as new models.

performers and the cutting edge of ambisonic sound reproduction as applied to the context of commercial theatre.

Together, these innovations exemplify how R&D investment in theatre can push technological innovation, and, vice-versa, how technological innovation can offer new possibilities for storytelling and audience experience.

Production run:

This stage is the public presentation – from previews (where testing continues and the performance is developed based on feedback and response from a live audience), to opening night and through the show's run. Here, innovation focuses on the audience experience and delivery.

Innovation at this stage includes:

- **Artistic innovation:**
While much of the major artistic innovation typically occurs before the production run, important creative changes can still take place during this stage – particularly in immersive or interactive theatre, where audiences play an active role in shaping the experience.
- **Technical innovation:**
Which might occur if digital enhancements need to be developed, or if the performance is extended beyond the physical venue. Live broadcasts and streaming (such as the National Theatre's *NT Live* cinema broadcasts or the *In Camera* project launched by the Old Vic during the COVID-19 pandemic) have made novel use of digital technologies to reach wider audiences.³¹
- **Audience-engagement innovation:**
Although likely to have been initiated before the production run, audience-engagement can be reimagined at this stage, including when combined with technical innovation, for example through mobile apps, social media interactions, or real-time feedback during shows, as was seen in the Royal Shakespeare Company's *DREAM* production, funded as part of UKRI's *Audience of the Future programme*.³² *Audience of the Future* also supported immersive theatre company Punchdrunk to prototype technology to track audience movement, culminating in a mixed reality live performance that blended theatre with game design.³³ New approaches to reaching audiences might also target particular demographic groups – for example, new ways of reaching schools or young people might be explored at this stage.

Case study: LUNG Theatre

Location: Yorkshire, England

Type of innovation: Research

LUNG is a nationally touring theatre company specialising in verbatim theatre, education, and campaigning for social change. In recent years, the company has deepened its collaboration with academia, particularly through an ongoing partnership with the University of Nottingham's Sociology Department, where Co-Directors Helen Monks and Matt Woodhead are Honorary Research Fellows.²⁸

LUNG's academic collaborations provide benefits to both parties: academic researchers contribute rigour and expertise to LUNG's productions, while LUNG's work both contributes directly to the academics' analysis and understanding of social issues, and amplifies their impact. One example is LUNG's 2023 partnership with Professor Philippa Tomczak, recipient of an ERC Starting Grant and UKRI Future Leaders Fellowship. Together they produced a short film with Janet Farrar, whose son died at HMP Woodhill. The film was screened at the International Death in Custody Conference, where the UN Special Rapporteur on Prisons called it 'invaluable' in exposing an urgent global issue.

Professor Tomczak then served as Academic Advisor for *Woodhill*, LUNG's verbatim production exploring self-inflicted deaths at the prison. To support the development of this production, LUNG founded the Woodhill Families Group, made up of people who had lost relatives in the prison. The resulting work – which prioritised academic rigour and accuracy in its development – won five awards and received multiple five-star reviews. The Families Group also directly informed policy recommendations presented by Professor Tomczak, with the families themselves, at the Houses of Parliament.²⁹

LUNG now embeds an Academic Advisor in all projects, including Professor John Holmwood (*Trojan Horse*) and Dr Lisa Warwick (*The Children's Inquiry*). This work is currently supported by modest university impact grants and exemplifies the benefits of deepening relationships between academic research and artistic enterprise.

Case study: National Theatre

Location: **London, England and UK-wide**
Type of innovation: **Audience-engagement innovation and technical innovation**

NT at Home is the National Theatre's streaming platform, supported by Bloomberg Philanthropies' Digital Accelerator Programme. It was launched in December 2020 after a series of YouTube premieres during the COVID-19 pandemic saw over 15 million people across the globe watch National Theatre plays whilst the National's stages were dark and its venues closed. This success drove the theatre to develop a new subscription streaming service, to allow audiences to experience world-class theatre on demand.

To make watching *NT at Home* as rewarding as possible for its global audience, the NT digital team experimented with new filming techniques, using the latest full-frame cameras to capture a wider range of lighting conditions – enabling even the darkest scenes to appear on screen as they do in the theatre to the human eye. NT also worked with Vivid Broadcast – who provide the NT with 'OB' or outside broadcast facilities (allowing the transmission of recordings from outside of traditional studio spaces) – to ensure that their trucks were able to facilitate the breadth of firmware needed to remotely control cameras based in the theatre. Experimentation with AI plugins was also required to remove coughs, ringtones, and other audio disturbances from the recordings and to deliver the ideal audio composition.

Last year over 31 million minutes of theatre were streamed in 184 countries on *NT at Home*. Shows are released monthly from the National Theatre's stages, the West End, and partner theatres across the UK. It has become a leader in its field, offering a broad range of productions from *Phaedra* and *Prima Facie* to *Peter Pan* to new audiences, and directly supporting theatre makers through fees and royalties.

NT at Home is also an important part of the National Theatre's ambition to make performances as accessible as possible on a truly global scale, with all plays available with captions and audio description. The National is now building up their catalogue of work available with British Sign Language interpretation.

Legacy (post-performance and impact):

After the final curtain, a play's life can continue in various ways. The legacy stage includes archiving the production (scripts, recordings, production notes) and sometimes touring the show or adapting it (e.g. into a published play text, radio/TV/film version, or sequels and revivals in the future). The play might also be published for future production or study – either by mainstream theatre publishers, or through companies which license versions for production by different groups (e.g. amateurs, schools, theatres of a different scale).

Innovation in this phase often revolves around learning and extending the play's impact and can include:

- **Audience-engagement innovation:**
This may involve finding new ways to capture audience feedback and data to understand impact, or new approaches to building communities (schools programmes, online platforms) that keep the conversation going.
- **Research:**
Which can be initiated to help to measure, understand and communicate the value of a piece of theatre. Research increasingly looks to measure not just economic impact but social and cultural outcomes. Approaches might capture innovative metrics, or create data-based visualisations of productions or evaluation methods that translate a play's cultural significance into evidence for policymakers and funders. Evaluation is critical at this stage – capturing what worked, what didn't, and the perspectives of creative teams, partners, and audiences to inform future R&D.

The success of *NT at Home* has informed broader sector strategies around digital theatre, with the NT actively sharing insights through industry forums and partnerships. As the NT continues to evolve, *NT at Home* exemplifies how digital platforms can extend artistic impact, foster inclusivity, and support sustainable growth in the performing arts.

How RD&I feature outside of the artistic cycle

Digital marketing and audience development:

Marketing and audience development are often the areas where theatres are most embracing digital innovation. An Arts Council England survey shows that nearly 9 in 10 (88%) arts organisations consider digital tools '*essential or important*' for marketing.³⁴ A recent study of European theatres found that of all potential applications within theatres, AI technologies are primarily being used in marketing and audience management – including chatbots for customer service, automated ticket recommendation systems, and algorithms that optimise the timing of email communications.³⁵

Areas where theatres routinely innovate their approach include:

- **Technical innovation:**
Which might include new tech-enabled approaches to social media and content campaigns (e.g. data-driven targeting) or the development of new ways to capture and distribute digital content.
- **Audience-engagement innovation:**
Which might include novel approaches to building partnerships and community participation programmes beyond a single piece of theatre, for example Leicester Curve's development of 'Neighbour-Hubs' which respond to the health, economic and social disparities in five communities in Leicester, as well as their creative workshops in care homes and Memory Cafes which are delivered in partnership with AgeUK and Anchor Housing.³⁶ Audience-engagement innovation can also be combined with technical innovation, for example in 2017 Arts Council England worked with *Cinegi Arts&Film*, to bring filmed theatre and dance productions to community venues for the first time.³⁷

Ticketing and audience experience:

Innovation in ticketing systems and the audience's transaction experience is another area of R&D outside the artistic process. The aim is to make finding and attending a show as accessible and user-friendly as possible, while also maximising revenue, boosting attendance, and gaining deeper insights into the customer experience.

Innovation in this area tends to focus on:

- **Technical innovation:**
Which might include experimentation with online and mobile ticketing systems – for example, testing new purchase pathways, including integration with social media platforms, or optimising dynamic pricing (many theatres now offer tickets which change their price depending on demand, in part to allow them to subsidise the cost of accessibly priced tickets) and revenue management approaches. It may also include the novel usage of audience data to predict audience demand for different productions and highly focused marketing.
- **Audience-engagement and technical innovation:**
Which can intersect in new approaches to both online and in-person audience experiences – for example, through innovative ways of designing or animating foyer and front-of-house spaces to create more immersive and welcoming environments.

Fundraising and New Business Models:

Beyond ticket sales, theatres are innovating in fundraising and business models to diversify their income and increase financial resilience. With public subsidies under pressure and competition for audience spending high, theatre organisations have had to creatively expand how they generate value and support their work.

Areas of innovation include:

- **Technical innovation:**
Where organisations experiment with new digital fundraising approaches, and technological advancements like sentiment analysis and opinion mining offer new opportunities to identify potential donors (e.g. some US performing arts organisations have implemented predictive analytics models to score and forecast donor giving based on behaviour and demographics).³⁸

- **Organisational innovation:** Which might include the development of new forms of partnership, and experimentation with membership structures, for example, the introduction of subscription-based, digital, or hybrid models. It can also encompass new approaches to revenue generation, from novel ways of capturing the value of created intellectual property to innovation within ancillary income streams such as merchandise and catering.

Accessibility:

RD&I has the ability to make theatre much more accessible to audiences of all types.

Key areas of innovation include:

- **Technical innovation:** Which can include the development of assistive technologies such as the National Theatre's *AR Smart Caption Glasses* system and mobile apps like the North American *GalaPro*, which provides personalised captions or audio description without disrupting other audience members.³⁹ Streaming platforms and emerging VR tools have also expanded access, enabling remote and low-cost participation in theatre for audiences who are geographically or economically excluded.⁴⁰
- **Organisational and audience-engagement innovation:** Where theatres are developing new approaches to broaden access, for example through relaxed performances or upgrading physical access. Theatres have for some time also been experimenting with offering virtual tours of spaces ahead of time to help individuals to identify where there might be accessibility issues and to familiarise themselves with the spaces – for example, Northern Stage provides a self-guided virtual tour highlighting key accessibility features, alongside videos that help visitors understand what to expect from each of its performance spaces.⁴¹ Sector-wide organisational innovation in accessibility is also occurring, with bodies such as Stagetext and Arts Council England advancing inclusive practice through developing their funding criteria and the guidance they offer.

Sustainability:

Theatre organisations are increasingly using RD&I to boost sustainability and efficiency including through:

- **Technical innovation:** Which might involve the creation of new technological solutions or the adaptation of existing technologies for theatrical use. Examples include the implementation of energy-efficient systems such as LED lighting, digitised asset management, reusable sets, and sustainable production methods, guided by initiatives like the *Theatre Green Book* and the work of ReStage. Theatres are also experimenting with less extractive materials; for example, the National Theatre has trialled the use of Eco Board Composta Block as an alternative to polystyrene in prop making. Digital tools are increasingly supporting Net Zero ambitions, including project management platforms, AI-powered scheduling, and remote collaboration technologies (e.g. virtual design and Zoom rehearsals). Data-driven analysis of audience movement and staffing patterns also offers opportunities to enhance visitor experience while reducing resource consumption.
- **Operational innovation:** Which is critical where shared solutions are needed across the performing arts. For example, smaller theatres are increasingly accessing innovation to support their sustainability journeys through collective approaches such as software licensing consortia and shared IT infrastructure models.

Education and skills:

Education and participation programmes can be sites of creative R&D, using digital tools, immersive formats, and co-creation with young people and teachers to broaden access to arts learning. Initiatives like the National Theatre *Collection* or RSC's *Live Lessons* and *Schools' Broadcasts* show how theatres experiment with how they support curriculum delivery and youth engagement.

Approaches include:

- **Audience-engagement innovation:** Which might involve collaboration between theatres, teachers and education specialists to develop new classroom methodologies inspired by aspects of a production or rehearsal room practice or new types of curriculum resources or schemes of work. Beyond the schoolroom context, this might involve developing new approaches to participatory work with young people, community organisations, and non-professionals, using theatre practice to build skills, develop and enhance wellbeing and connect communities. Theatres can also drive innovation in how professional skills are taught: for example, young technicians nationwide now use the 'pre-visualisations' developed in real theatres to improve their technical skills.

- **Research:**

Where theatres are adapting the methodologies of traditional skills research and surveys to better identify current and emerging needs in the sector, which are often harder to track given the high number of freelancers. This is particularly important for identifying the skills required to support innovation, especially technical innovation, where the rapid pace of technological change demands new pathways for skills development and real-time insight into the sector's evolving requirements.

This process can also generate new artistic work, as teachers or learners respond to a production by creating their own performances or creative outputs – which may then be shared either digitally or with live audiences.

Archives:

Archiving and digital preservation can increasingly be seen as areas for **technical** and **organisational innovation** – with institutions digitising scripts, stage designs, and performance footage to create open-access resources that extend the life and public value of theatrical work.

Data and evaluation:

While much of the innovation around data and evaluation takes place in relation to specific activities or as part of the legacy of individual productions, these areas are increasingly becoming distinct sites of innovation in their own right. Emerging approaches include:

- **Technical innovation:**

Some theatres are building their own integrated data infrastructures – such as centralised data warehouses and enterprise-wide dashboards – to break down silos and provide a single source of truth for decision-making. These systems bring together data from ticketing, fundraising, marketing, and production, allowing leadership teams to act on real-time insights. For example, the National Theatre has recently launched a comprehensive data platform, with pilot projects demonstrating the potential of data visualisation to track audience engagement, educational impact, and production outcomes.

- **Organisational innovation:**

Where organisations in the sector take new approaches to deliver more consistent and effective approaches to evaluation, addressing what is currently a fragmented and uneven landscape. The Centre for Cultural Value is leading a national research initiative (funded by the Economic and Social Research Council) to develop a blueprint for a *UK Cultural Data Observatory*. The project brings together sector specialists such as The Audience Agency and MyCake, alongside policy partner Culture Commons, to create a more coherent, evidence-based framework for understanding cultural value and impact across the arts.⁴²

- **Research:**

Where organisations are increasingly collaborating on and experimenting with new forms of research, for example exploring both the wider impact of the performing arts on health, education and social outcomes, and the inner workings of the sector itself, including issues such as diversity and inclusion.

Use of third-party suppliers:

Third-party suppliers are a crucial cog allowing innovation to take place in the theatre sector. They include both performing-arts-specific suppliers (for example, companies specialising in stage lighting) and those offering more general technologies or materials (such as new eco-friendly products) that can be applied to theatre production.

Many are based outside the UK. For example, among the key suppliers used by the National Theatre in recent years are:

- **Lighting:** ETC (US) and Martin (Danish in origin, now US).
- **Performer tracking:** Zactrack (Austria) and Spot Me (France).
- **Sound:** d&b (Germany) and Meyer (US).
- **Sound consoles:** DiGiCo (UK).
- **Comms and video:** Riedel (Germany).
- **Playback:** Figure 53's QLab (US).

Larger organisations, with greater purchasing power, more specialist staff and deeper supplier relationships, often collaborate directly with these companies – acting as market testers and ensuring that new products are developed to meet the specific needs of theatre. For example, the National Theatre recently partnered with US company Tait to trial a new approach to its point hoist system (which lifts and lowers heavy objects such as lighting fixtures). The innovation was first showcased in *The Estate*, directed by Daniel Raggett, where designer Chloe Lamford used the new system's flybars and lifts to enable fluid, in-view scene transitions that heightened the dramatic flow of the production.⁴³

Similarly, the NT has collaborated with d&b and Meyer to develop object-based *Soundscape* and compact line-array systems, which subsequently inspired the development of new software, including the NT's own show-control system Atlas. These innovations diffuse through the wider sector over time.

Some third-party providers, such as lighting manufacturer Chauvet, also actively seek to collaborate with freelancers in the sector. In Chauvet's case they work with freelance lighting designers to test prototype fixtures, gather feedback on sample products, and inform the design of future models based on practitioners' needs.

However, despite these productive relationships, many organisations – particularly smaller ones – lack the resources and access needed to participate in or benefit from such innovation. Theatres are struggling to retain highly skilled staff tempted away by better-paid industries, leaving significant skills gaps that limit their ability to innovate. The high number of freelancers in the sector also means that the costs of additional training are more likely to fall on workers themselves, and the complexity of portfolio careers can make the skills system more difficult to navigate.⁴⁴

Collaboration across the sector on R&D remains limited, even though joint approaches could unlock major productivity gains. Theatre can also struggle to compete with other parts of the performing arts sector for attention from third-party organisations – for example, major arena tours who likely have different requirements but larger budgets.

Looking ahead, technologies such as AI offer both transformative potential and well-publicised risks.⁴⁵ For example, an AI-assisted approach to materials discovery and sector asset cataloguing could contribute to sustainable design, reuse of dormant assets, and support productivity gains. Yet, given the systemic challenges facing the theatre sector, there remains no clear mechanism to support innovation or diffusion at this wider, sector-wide scale, even where third-party organisations might be willing to support such interventions.⁴⁶

What are the next frontiers for RD&I in theatre?

Amid economic strain, changing audience behaviours, and technological acceleration, the theatre sector's capacity to innovate will determine its future resilience. Informed by conversations with leaders from industry, policy and academia, this chapter explores four of the principal drivers that will shape the direction of theatre RD&I over the next decade – audiences, the sector itself, new technologies, and policy ambitions – and brings to life some of the most exciting potential areas for investment.

Audience drivers

Demographic change:

- 22% of the UK population attended the theatre (including musicals) in the past three months (Sept 2025).⁴⁷
- Whilst West End audiences skew 45 and over, younger generations are also showing a healthy interest in the art form, with 18-24 year-olds now as likely to attend the theatre within a three month period as the population as a whole.⁴⁸ These younger cohorts are gender-balanced, and are more urban, diverse and likely to be LGBTQ+. ⁴⁹ This generation is also more likely to discover theatre content online or via social media.
- An aging population is driving a need for innovation in accessibility (e.g. live subtitling, hearing loop integration, inclusive design).

Drive for new and exciting forms of content:

- The main motivator for many attending the theatre is enjoying entertaining, light-hearted, fun experiences – theatre ranks as a top “joyful night out” for 1 in 4 UK adults.⁵⁰
- Demand for digital formats is mixed: only 9% watched a pre-recorded arts event in 2024-25 (down from 10% the year before).⁵¹ However, the success of online theatre platforms such as *NT at Home* demonstrates that there remains a strong audience appetite for digital theatre experiences.
- There has been a boom in immersive theatrical experiences, often blending theatre with other sectors – for example, Secret Cinema events combine screen and live performance, while *Elvis Evolution* integrated theatre, technology, and live music. However, the long-term commercial viability of such ventures remains uncertain.⁵²

Changing audience behaviour:

- Audiences are booking later than ever, creating financial uncertainty for venues and touring companies.⁵³
- Overall attendance is rising, but the frequency of attendance is falling – over half of 2023 audiences were first-time bookers.⁵⁴

Inclusion, accessibility and climate:

- Audiences (alongside sector bodies) are calling for greater representation for different demographics, accessible pricing and inclusive design and production (e.g. improving physical accessibility, introducing sensory friendly performances and providing assistive technologies).⁵⁵
- Cultural provision and access to funding remains unequal across the UK.⁵⁶
- 72% of theatre audiences believe cultural organisations should take an active role in influencing society on climate issues; 89% expect them to reduce and recycle waste; and 64% expect them to work with suppliers who share their values.⁵⁷

Theatre sector drivers

New forms of creative expression:

- Artists are wanting to tell fresh stories and develop new forms, approaches, and genres.

Evolving business models:

- Amid depleted reserves, reduced public funding, under-investment in capital and cash-flow pressures, theatres are keen to innovate to reshape their business models but face barriers to innovation including risk aversion, short-term funding cycles, and demands for predictable outputs.⁵⁸
- Significant rises to marketing, labour, and venue costs have led to massive cost inflation. The industry is looking for sector-wide solutions to reduce these escalating costs.
- The theatre sector plays a crucial role in generating new intellectual property that bring financial benefits to the wider creative industries, yet it rarely captures those benefits for itself.

Technological gaps and experimentation:

- While digital adoption and IT infrastructure remain uneven across the sector (and there are particular challenges in smaller organisations making use of new technologies), theatres are actively keen to experiment with emerging technologies.⁵⁹

Evolving purpose of organisations:

- Non-profits, in particular, increasingly combine cultural, social, and commercial aims.⁶⁰

Skills and expertise:

- The sector is seeing significant supply chain convergence – from set designers to live broadcast directors to lighting specialists – which is enabling the diffusion of new techniques and technologies across theatre.
- Skills gaps persist across the sector, compounded by a high proportion of freelancers, which shifts training costs onto individuals and fragments the skills system. Retention is also difficult, as skills developed within the sector are highly transferable and salaries offered in other sectors can be higher.

Complex sector-specific needs

- Theatre’s unique challenges, such as the intricacies of ticket sales, are driving sector-specific innovations, for example the optimisation of dynamic pricing systems to allow theatres to subsidise the cost of accessibly priced tickets.

Technology drivers

Artificial Intelligence (AI) and machine learning

- AI and machine learning is transforming content creation onstage (including scripts, images, music, audio, video, design) and enabling rapid prototyping.
- Automation is speeding up technical changeovers, and increasing productivity.
- AI offers the opportunity to transform audience insight and box-office optimisation.
- Urgent questions are being raised by the sector around ethics, rights and inclusion in relation to artificial intelligence, with two of the greatest areas of concern being the potential use of creative content to train AI without explicit permission from the rightsholders, and the environmental impact of AI.⁶¹

Immersive technologies (e.g. Virtual Reality (VR), Augmented Reality (AR), Mixed Reality (MR))

- Immersive technologies are opening new frontiers in theatre, including changing in-person experience and distribution methods.
- New forms of haptics, wearables, and sensors are driving potential approaches to immersive experiences.

Robotics

- The use of robotics in performance (e.g. stagecraft and lighting) is evolving, with growing potential for these technologies to be used more extensively onstage or to deliver new functions offstage.

Synthetic biology, bio design and sustainable materials

- Sustainability efforts are causing production and costume designers to rethink their approaches. Theatres have become early adopters of bio-based materials for costume and production design, repurposable modular design and AI-enabled reuse systems, all of which have applications in other sectors, including corporate events and live music production.

Intelligent visual and interactive technologies

- Advances in 3D imaging, volumetric and motion capture, and photogrammetry could transform how performances are created, staged and recorded.

Policy drivers

Kickstart economic growth

- The Government is aiming to use creative industries' growth to support an increase in living standards in every part of the United Kingdom, as set out in the *Creative Industries Sector Plan* and advanced through the Mayoral Strategic Authorities.⁶²
- Their aim is to support growth through innovation and increased trade and exports.⁶³
- The UK Government is also looking to drive greater levels of technology adoption among small businesses via the *Made Smarter* adoption programme and the *AI Opportunities Action Plan*.⁶⁴

Build an NHS fit for the future

- The Department for Culture, Media and Sport (DCMS) has identified advancing understanding of, and increasing the impact of, the creative sectors on public health as a key area of research interest.⁶⁵

Break down the barriers to opportunity

- The *Creative Industries Sector Plan* points to the part the creative industries can play in building 'a resilient, skilled and diverse workforce fit for the future'.⁶⁶

Make Britain a clean energy superpower

- The *Sector Plan* also points to the creative industries' role in meeting Climate and Net Zero objectives.⁶⁷

Future frontiers

As our RD&I taxonomy demonstrates, many theatres are already responding to these drivers by trialling new business models, exploring emerging technologies, adapting to changing audiences, and contributing to economic growth as well as health, education, and Net Zero goals. Yet systemic intervention and increased investment could enable them to go further. By increasing our understanding of the sector's RD&I capabilities, and by examining how the levers driving industrial change interact, we can begin to identify the next frontiers for theatre RD&I – and where targeted policy investment could deliver a step change for the sector. Five initial areas of opportunity include:

1) Marketing, audience insight and engagement

Why? Demographic shifts, late booking, and the changing nature of audience engagement demand new marketing approaches. By its nature, it can be harder to search or discover new performing arts content than content in other entertainment sectors, and marketing costs have risen sharply, straining resources. The sector needs to balance urgent financial imperatives with a commitment to access and diversity. Evolving demographics and new technologies present both challenges and opportunities for audience growth.

How? Funding could support:

- The crowding in of commercial funds to support the development of a cross-sector audience initiative to produce shared insight, reduce marketing costs, and improve audience reach and inclusivity.
- The development of innovative access-focused dynamic pricing models.
- Experimentation with new technologies e.g. support the piloting of data-driven forecasting tools for late booking and AI ticketing agents to improve audience experience.

2) New genres and forms

Why? Audiences are seeking fresh, immersive and joyful experiences, while artists are increasingly exploring cross-genre and hybrid forms of storytelling. However, successive funding cuts and the lasting impact of the pandemic have understandably made the sector more risk-averse – just when bold, experimental and cross-disciplinary work is needed to engage changing audiences and compete with other forms of content. The UK also has a long history as a world-renowned cultural engine and exporter of intellectual property – encouraging theatres to take risks on bold, original content will have long-term economic and soft power benefits.

How? Funding could support collaborative R&D exploring the next generation of theatrical forms. This might include:

- Interdisciplinary cohorts of artists, designers, technologists and producers based across the UK prototyping new storytelling models.
- Labs or residencies focused on the intersection of performance with other sectors and disciplines.
- Experimental production grants to test emerging genres with changing audiences.

3) Theatretech

Why? Rising production costs, labour pressures, and uneven access to technology are limiting efficiency and innovation, despite the fact that third-party providers are eager to collaborate with the sector to trial new tools. Smaller organisations, particularly those out of London, have less ready access to new technologies and technical skills. There is a clear opportunity to modernise stagecraft and improve performance capacity.

How? Funding could support the establishment of *Theatretech Testbeds* across representative venues (e.g. large, mid-scale, producing, touring) to pilot automation, robotics and networked lighting and sound. These collaborative trials between theatres, suppliers, and R&D partners would aim to support the development of bespoke technologies for theatre, increase uptake, reduce costs, and share learnings. SME adoption grants could be offered to support takeup of technologies. Building links to skills development initiatives would be essential to ensure theatres can make the most of new technologies.

4) Materials and reuse

Why? Audiences increasingly expect theatres to act on climate commitments, while rising production costs make material efficiency essential. Transitioning to Net Zero requires reducing waste and extending the life of sets, props, and costumes. New technologies – and particularly AI – now make it quicker and easier to catalogue and track assets across the sector.

How? Funding could help to accelerate the work of pioneers like the *Theatre Green Book* and ReStage by enabling interdisciplinary R&D focused on developing sustainable new materials, and reusable sets and props. In parallel, it could support the creation of AI-enabled cataloguing tools to build a national reuse database of theatre assets currently in storage. Together, these innovations would foster experimentation in sustainable design, cut waste and costs, and promote greater collaboration and circularity across the theatre supply chain, with clear potential benefits to other sectors (e.g. screen and fashion).

5) Innovation to reach a global marketplace

Why? The convergence of live performance with games, film, music, and digital media offers opportunities to reach new audiences and markets. Yet the international commercial potential of these emerging forms, from hybrid stage-to-screen productions to immersive, transferable performances at the intersection of live and digital, remains largely untested. At the same time, the UK Government has identified creative exports as a key driver of economic growth.⁶⁸

How? Funding could support collaborative R&D exploring new theatrical forms that fuse physical and digital practice, including hybrid, virtual, and immersive productions. Support could also be provided for interdisciplinary cohorts of artists, designers and technologists to prototype and test new production methods, with a specific ambition to reach a global marketplace. Investing in new technologies and operational approaches that make shows more scalable and transferable would increase UK exports.

05.

What support do theatres receive, and why is there a gap?

Innovation support for theatres

There is a strong appetite for innovation in the UK theatre sector. However, in a small-scale survey of performing arts organisations (as part of a wider study), Arts Council England and the Audience Agency found that 94% of respondents cited a lack of funding and resources as a key barrier to undertaking further innovation.⁶⁹ These findings echo the National Theatre's previous research *Scene Change*, which showed that successive funding cuts and the lasting effects of the global pandemic have created a more risk-averse environment – precisely at a time when innovation could unlock growth and wider impact.⁷⁰

This is a missed opportunity – not just for the theatre sector itself but for the country more widely, as research, development and innovation (RD&I) in theatre can make a direct contribution to the UK Government's ambition to grow the economy. This is something the Government acknowledges – the recently published *Creative Industries Sector Plan* highlights the potential of innovation to drive economic growth and identifies 'music, performing and visual arts' as a sub-sector that can help deliver the Government's broader *Plan for Change*. Innovation through the creative industries, including theatre, also aligns with complementary national priorities: building an NHS fit for the future; breaking down barriers to opportunity by developing a resilient, skilled and diverse workforce; and making Britain a clean-energy superpower by achieving climate and Net Zero objectives.⁷¹

Given the business model challenges facing the theatre sector, and the widespread identification of lack of funding as the principal barrier to innovation, government support is clearly an important lever for increasing RD&I activity. However, it is not the only one. As is shown by the taxonomy and case studies in this paper, both commercial and publicly funded arts organisations have already invested significantly in RD&I initiatives. Trusts and foundations have also played a growing role in supporting innovation in the arts, including theatre. Bloomberg Philanthropies, for example, noted that '*digital adaptation is critical for the non-profit cultural sector to remain competitive and fulfil its potential.*' Its *Digital Accelerator Programme* is one of the most significant such interventions, investing \$128 million since 2021 to support digital innovation, diffusion and adaptation across the sector.⁷²

The national arts councils have increasingly integrated RD&I into their programmes. Arts Council England's *National Lottery Project Grants*, for example, provides specific guidance for supporting research and development projects – defined as those in which '*a person or group develop a new idea or explore a new way of working.*'⁷³ *XRtists*, an AHRC programme to support the adoption and implementation of creative immersive technologies within the arts and culture sector across the UK, has been delivered in partnership with all four arts councils: Arts Council England, Arts Council Northern Ireland, Arts Council Wales and Creative Scotland.⁷⁴

However, much of the arts councils' funding is already tied up in sustaining organisations' core costs and keeping existing programmes operational. With the exception of Creative Scotland, their mandates also focus almost exclusively on the not-for-profit sector, while the theatre ecosystem encompasses a wide spectrum of business models, including highly commercial enterprises. As a result, while the arts councils play a valuable role in supporting RD&I at the margins, they cannot – in their current form – provide the scale of industrial investment available to other sectors through broader innovation levers.

Accordingly, when considering how best to strengthen RD&I across the theatre sector, it is important – alongside acknowledging the contribution of the arts councils, trusts and foundations, and existing organisational initiatives – to examine whether the three principal mechanisms through which government stimulates innovation across the wider economy are operating effectively: UK Research and Innovation (UKRI), R&D tax relief and technology diffusion programmes.

UKRI

UK Research and Innovation (UKRI) is a non-departmental public body sponsored by the Department for Science, Innovation and Technology (DSIT), which invests in research and innovation to 'enrich lives, drive economic growth, and create jobs and high-quality public services across the UK'.⁷⁵

In March 2022, the Department for Business, Energy and Industrial Strategy (BEIS) set out its R&D allocations for the next three years, confirming a budget of £39.8 billion in 2022-2025. Of this, over £25 billion (more than 60%) was allocated to UKRI, making it the most important lever in terms of increasing the level of RD&I across the economy.⁷⁶

In recent years, UKRI has adopted an increasingly ambitious approach to supporting the creative industries, with both Innovate UK and AHRC launching flagship programmes. However, it is widely recognised that the scale of opportunity within the creative industries has consistently outpaced public prioritisation and investment.⁷⁷ In addition, not all parts of the creative industries have been able to benefit equally from increased support. UKRI is now in the process of developing a new R&D strategy for the creative industries, signalling a key development in its developing commitment to the sector.

Eligibility for UKRI funding depends heavily on the specific funding stream. For instance, many higher education providers (HEPs) participate in the *Research Excellence Framework* and receive recurrent annual funding, whereas a commercial tech start-up might access one-off awards through an Innovate UK programme.

The largest proportion of UKRI funding has historically been – and largely remains – directed towards HEPs. However, recognising that not all high-quality research organisations are universities, UKRI has established a classification system for *Independent Research Organisations* (IROs). IRO status brings significant benefits, including the ability to lead or co-investigate UKRI-funded research and innovation projects, and access to funds to support fellowships and early-career researchers affiliated with the institution.

To obtain IRO status, an organisation must demonstrate in-house research capacity that complements and extends existing UK research, alongside the capability and expertise to independently deliver and lead research programmes.

Currently, 11 museums hold IRO status, as do heritage organisations such as Historic England and Historic Royal Palaces.⁷⁸ However, there is only one performing arts organisation on the list: the Royal Shakespeare Company. At the sector level, this represents a missed opportunity – and an inhibitor for UKRI in providing greater support directly to the theatre sector. If even a small number of larger-scale performing arts organisations were to gain IRO status, research on the performing arts would be more likely to be led by those directly embedded in the sector. It would also open up greater opportunities for new researchers to be based within theatres rather than solely in higher education institutions, and would enable those working within the IRO to be funded as 'co-investigators' as part of wider UKRI projects, even when their organisation was not the lead applicant.

Case study:

Royal Shakespeare Company

Location: **Stratford-upon-Avon, England**

Type of innovation: **Artistic innovation, technical innovation, audience-engagement innovation and research**

The Royal Shakespeare Company is the first, and currently only, performing arts organisation to be awarded *Independent Research Organisation* (IRO) status. It has been leading innovations in CreaTech (the intersection of creativity and emerging technologies) for the past 10 years under the creative stewardship of Sarah Ellis, and specifically has been the key player in advancing the sector's understanding of, and capacity for, real time immersive performance.

From a production of *The Tempest* in 2016 featuring a motion capture Ariel interacting in real time on stage (supported by UKRI and the technology company Intel), to their work on the *UKRI Audience of the Future Challenge Fund*, leading a unique team of UK creative industries specialists to develop immersive live performance experiences for audiences around the world, the RSC has been at the forefront of technical development in the sector.

Now, the RSC is the site of a major AHRC funded feasibility study into a *Future of Performance Institute*, which brings together a community of artists, researchers and cultural workers responding to the changing needs of the performing arts sector. This includes what they describe as a 'thought stewardship programme' – a series of year-long international fellowships centred on historically underrepresented voices. Each Fellow will pursue a line of inquiry grounded in their own practice, addressing some of the most pressing challenges facing the creative industries and wider society.

Alongside its work exploring the boundaries of form and technology, the RSC's IRO status has allowed it to expand its research work to better understand the power and importance of arts learning to children and young people. This includes:

Time to Act – a significant research project evaluating the impact of rehearsal-room approaches to teaching Shakespeare on language

Through funding mechanisms that do not require lead or co-investigators to hold IRO status, UKRI has also enabled other theatres to lead innovation projects. For example, in 2020 Innovate UK-funded Theatre Royal Bath to develop an interactive theatre learning platform, and between 2019 and 2021 the *Industrial Strategy Challenge Fund* (ISCF) supported the National Theatre's work on immersive access services, including translation captions for non-English speakers, personalised sign-language displays for BSL users, and audio description for visually impaired audiences.⁸³

Of course, the theatre sector can also benefit from UKRI investment without necessarily acting as a lead applicant or co-investigator.

Theatre is a vital part of UK society – both past and present – and the UK's higher education sector includes many universities with strong drama and theatre departments (and even HEPs with theatres based within them, for example Warwick Arts Centre and Exeter Northcott), as well as HEPs specialising in the performing arts that secure research funding in their own right. It is therefore unsurprising that, when we take a wider view, a strong symbiotic relationship between theatre and the research community emerges. This includes projects ranging from studies of playwrights such as Shakespeare and Beckett, to research on social prescribing, to a piece of work on mass decarceration in Ireland that culminated in a theatre production.

While this paper does not focus primarily on such research, examining this broader field helps us to understand the trends shaping UKRI's investment in theatre-related RD&I. Our analysis – which covers all UKRI-funded projects connected to the theatre sector worth over £100,000 since 2006 (see Appendix for full methodology) – shows a modest increase in this broader set of theatre-related funding over the past 18 years (Fig 1). Within this dataset, a keyword analysis also reveals shifting priorities: terms such as *communities*, *local*, *health* and *climate* appear increasingly often, while words more closely linked to industry practice – including *practice*, *performance* and *music* have become less frequent (Fig 2).

development and academic self-concept in young people.

Time to Listen – a study examining the benefits of taking arts and education seriously.

Other key programmes include:

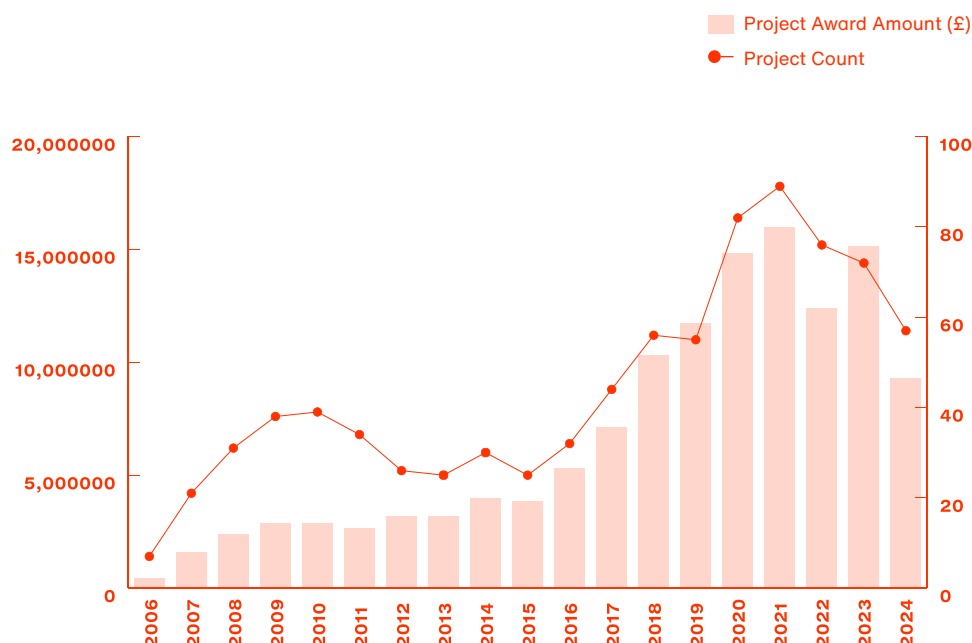
A partnership with the Cultural Learning Alliance to commission rapid evidence reviews on the benefits of Drama, Dance, Music, and Art & Design in education.

A collaboration with the Education Endowment Foundation as one of 11 research initiatives aimed at improving children's writing or maths skills, with impact evaluation conducted independently by NFER, focusing particularly on children in areas of socio-economic disadvantage.

A pilot programme (now in its second year) with social impact investment intermediary Figurative, testing a social outcomes financing framework to explore new forms of funding for the arts.

All of these initiatives work together to advance the sector's understanding of the changing ways in which content is being made and how audiences might engage with work in the future. Specifically, they see artist-led, applied research as fundamental to the future of the sector.

Fig 1. Changing number and total value of UKRI-funded projects over £100k related to theatre - showing proportional allocation of award amounts across project durations over time



Emerging Key Words

Each value on the graph shows how many more times a word was mentioned per project in [2023-2025] compared to [2005-2007]

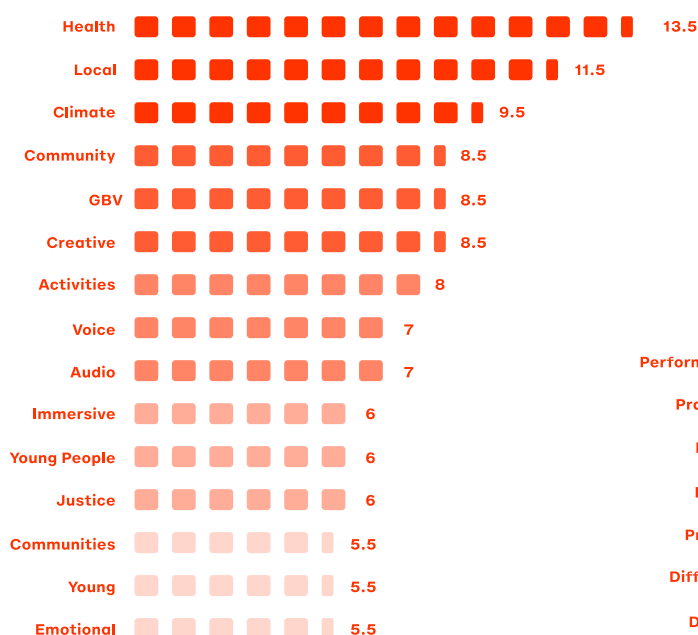
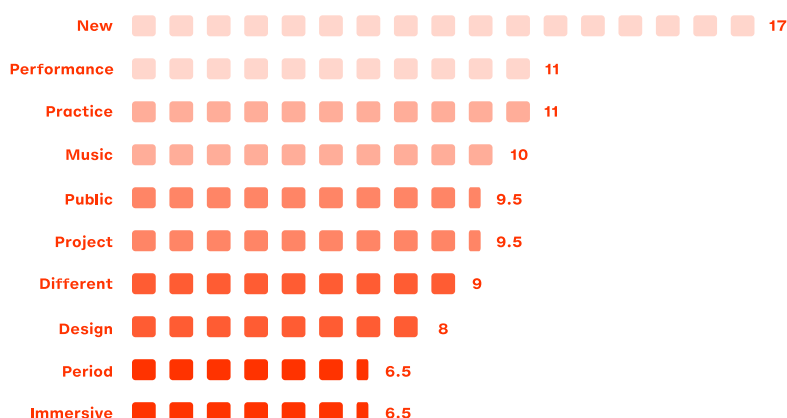


Fig 2. Emerging and disappearing words in UKRI theatre project titles and abstracts - identified by running a key-word trend model over the Titles / Abstract of these projects to see the trends

Disappearing Key Words

Each value on the graph shows how many more times a word was mentioned per project in [2005-2007] compared to [2023 -2025]



However, while theatres feature as an important theme within UKRI-funded research, analysis of the UKRI Gateway to Research database shows that only 1.2% of these projects listed a theatre as a lead partner and just 11.3% included a theatre as a project partner, meaning they are making a contribution (of time, expertise, resource) and have a contractual relationship in terms of output (e.g. shared IP) but do not benefit financially (see Appendix).⁸⁴ Despite the sector's clear relevance to UKRI's wider objectives, its direct participation in funded research therefore remains limited.

There may be greater opportunities for theatre to play a greater part in UKRI programmes in the future, and in particular an opportunity for theatres to be more closely involved in broader creative industries R&I initiatives.

For example, the *Convergent Screen Technologies* and *Performance in Real Time* (CoSTAR) programme is a £75.6 million national R&D network of laboratories developing new technologies to sustain the UK's global leadership across gaming, TV, film, performance and digital entertainment, and could offer an opportunity for the theatre sector to collaborate more actively with other creative subsectors.⁸⁵ Theatre's involvement in CoSTAR could include access to shared facilities, equipment and resources, as well as contributing to foresight research that builds collective understanding of industry impact, trends, technologies and future needs.

Similarly, the *Creative Industries Sector Plan* announced investment in a *Creative Content Exchange* – a new digital marketplace for buying, selling, licensing, and accessing digitised cultural and creative assets. Given the importance of intellectual property retention and commercialisation within the theatre sector, this initiative presents significant potential.

There is also scope for theatre to engage in the next waves of the *Creative Industries Cluster Programme*, which will expand into new sub-sectors and regions across the UK. This is one example of a UKRI funding model which comes with a requirement to devolve funding to businesses involved in R&D, offering a specific opportunity for a sector which would benefit from additional RD&I investment (another example is the *XRtists/Immersive Artists programme*). Theatre – either as part of a wider performing arts cluster or in collaboration with other creative sub-sectors – could be well positioned to apply in this forthcoming, or subsequent rounds.

R&D tax relief

R&D tax reliefs have been long recognised as an important part of the UK Government's support for innovative business, '*incentivising businesses to invest in R&D by allowing companies to claim an enhanced corporation tax deduction or payable credit on their R&D costs*'.⁸⁶ Their aim is to encourage greater R&D spending, leading in turn to greater overall investment in innovation.⁸⁷ The provisional estimated amount of total R&D tax relief support claimed for the tax year 2023 to 2024 was £7.6 billion, which corresponds to £46.1 billion of R&D expenditure.⁸⁸

Very few theatres, however, have made use of this mechanism. Although no official data is published on sectoral take-up, through this research (including conversations with organisations across the theatre ecosystem) only one theatre reported having applied for R&D tax credits, with one other organisation considering doing so.

There are two main reasons for this low level of engagement.

First, the definition of R&D used for tax purposes is narrow: '*R&D for tax purposes takes place when a project seeks to achieve an advance in science or technology*.' As such, much of the research, development and innovation (RD&I) activity described in the theatre taxonomy would not qualify.⁸⁹ The tax relief explicitly excludes advances in the arts, humanities or social sciences.⁹⁰

Second, the sector's attention has understandably been focused on theatre tax relief (TTR), which has been a critical lever to support theatrical production across the UK, particularly following the pandemic. TTR provides relief against corporation tax on qualifying expenditure associated with developing and staging new shows. Its success is evident in data showing that visitor numbers to London's West End have recovered more strongly than, and have even surpassed, those on Broadway.⁹¹

A further complication is that expenditure eligible for any R&D tax relief is excluded from TTR. HMRC's guidance makes clear that this exclusion applies whether or not an R&D claim is actually made: if the expenditure meets the qualifying criteria for R&D tax relief, it cannot also be claimed under theatre tax relief.⁹²

TTR offers a more generous rate of relief than R&D tax relief – 40% or 45% for touring productions, compared to a maximum of 27% under the R&D scheme (depending on company type). This means that if technical innovation undertaken during production were deemed to qualify instead under R&D relief, it would in fact place producers at a financial disadvantage.⁹³

However, this does not mean that R&D tax relief could not play a greater role within the theatre sector. In theory, it could serve as a valuable mechanism to stimulate investment in technical innovation that sits outside the production cycle. For instance, if a theatre were to invest significantly in developing an experimental AI ticketing agent, collaborating with a third-party organisation to develop a new point hoist system, or creating a novel dynamic ticketing system, R&D tax relief could, in principle, help to offset some of the associated risk.

Given the specificity of the tax relief, and its complex interaction with sector specific tax incentives (including those relating to other parts of the creative industries like screen, games and orchestras), creative industries businesses have made clear that they need greater guidance on when and how it can be applied. In response, HMRC is preparing to publish revised guidance for the R&D tax reliefs. This will clarify that, where a project in the creative sector seeks an advance in science or technology, arts activities that directly contribute to the advance by resolving scientific or technological uncertainties are within the definition of R&D for the reliefs, and their qualifying costs, such as salaries, can qualify for relief.⁹⁴ The hope is this will allow creative industries businesses, including theatres, to understand in greater detail other areas – relating to artistic output as well as backstage function – which may qualify for credits, and in the long term encourage more frequent and ambitious investment in technical R&D across the sector. In return, in order to make use of these credits, one of the challenges for theatres – as for all creative organisations – will be to be able to account explicitly for the R&D they do in line with the HMRC definition – recording hypothesis, method and insights, as well as recording the work explicitly in their financial reporting.⁹⁵

Technology diffusion programmes

The Government has recognised the positive impact of emerging technologies on economic growth and productivity. The Department for Science, Innovation and Technology (DSIT) is increasingly exploring how financial incentives and support, especially for smaller firms, could help businesses to develop and commercialise new technology, driving adoption across the whole economy.⁹⁶ In response, it has established a growing ecosystem of programmes designed to foster digital innovation and diffusion.

Theatre is no exception – digital adoption could lead to sector-wide gains in productivity and economic impact, as well as new creative possibilities. However, technology diffusion remains fragmented, constrained by persistent structural challenges such as high costs and limited infrastructure, particularly among smaller theatres and those outside of the capital. Digital skills gaps also present a significant challenge to greater technological diffusion, as do issues relating to staff retention as those skills developed in the theatre sector are often transferable and other parts of the economy are able to offer higher salaries.

Over the past decade, several creative industries-specific initiatives have aimed, at least in part, to support technology diffusion, including UKRI's *Creative Industries Clusters Programme*, the *Audience of the Future Challenge* (see Case Study 5), the *XRtists/Immersive Artists* programme, and CoSTAR.⁹⁷ In the future there may be a greater opportunity for theatre to play a part in such initiatives.

However, the most significant UK Government interventions on technology diffusion – including the *Technology Adoption Review* and *Small Business Strategy 2025*, whilst in theory aiming to support businesses across the economy are still not widely known within the creative industries more broadly, and certainly not within the theatre sector in particular, and often lack the tailored design needed to address its specific needs.

Policy recommendations

RD&I in UK theatre generates significant economic, social, and environmental value, with the sector already contributing £2.39 billion in GVA annually, with a turnover of £4.44 billion at last count.⁹⁸ However, the theatre sector has not yet fully capitalised on the potential of RD&I compared to other industries. Structural limitations, underinvestment, and a lack of tailored support have left substantial growth potential untapped.

The following recommendations are designed to build on existing government and sector initiatives, strengthening current efforts to more fully unlock the theatre sector's innovation potential.

For UK Government:

- **Embed the performing arts within wider government industrial innovation policy:**
Recognise that RD&I in the performing arts delivers significant economic, social and environmental value. Ensure that future innovation policy explicitly identifies the cultural sector as a site of R&D and innovation. Departments including the Department for Science, Innovation and Technology (DSIT) and the Department for Culture, Media and Sport (DCMS) should collaborate with the theatre sector to identify and support early adopters of innovative technologies, positioning them as pilots for sector-wide transformation and creating incentives for further innovation. The UK Government 'freelance champion' identified in the *Creative Industries Sector Plan* should ensure freelancers in the arts are fully able to engage with innovation levers and opportunities.⁹⁹
- **Clarify and align tax incentives:**
Ensure that sector-specific tax incentives (e.g. theatre tax relief) are complementary, not contradictory, to the broader R&D system. HMRC should work with the sector and arts councils to develop clear guidance and examples showing when and how R&D tax relief can apply to technical innovation within the creative industries, including in theatre.
- **Proactively support the ethical integration of AI and digital technologies within the theatre sector:**
In line with the recommendations of the SME Digital Adoption Taskforce, for the ambitions of the taskforce, working with the Department for Business and Trade (DBT) to deliver a targeted awareness campaign tailored to the sector's specific needs, whilst recognising concerns around the use of creative works to train AI and its environmental impact.¹⁰⁰

- **Implement the Technology Adoption Review:**
DCMS, DSIT, the Department for Education (DfE) and HM Treasury should partner with industry to establish business-to-business CreaTech demonstration hubs (as recommended in the review) in theatres and share best practice through case studies and support networks. These hubs should have a particular focus on accelerating technology diffusion to smaller organisations, especially those based outside London. Given skills challenges relating to tech diffusion, and as outlined as a recommendation of the review, theatres should also be supported to develop peer-to-peer networks and to improve skills and training relating to tech diffusion.¹⁰¹

For UK Research and Innovation (UKRI):

- **Recognise the arts, and in particular theatre, as a driver of innovation, creative skills and social impact in the forthcoming UKRI Creative Industries Strategy.**
- **Invest in new systemic RD&I programmes for theatre:**
Innovate UK, working with other funding councils, should investigate dedicated funding streams for areas including:
 - *Marketing, audience insight and engagement* – data-led approaches to building and diversifying audiences.
 - *New genres and forms* – collaborative R&D exploring the next generation of theatrical forms.
 - *Theatrettech* – automation, robotics, and digital infrastructure for performance.
 - *Materials and reuse* – bio-based materials, modular design and AI-enabled reuse systems.
 - *Innovation to reach a global marketplace* – hybrid, immersive, and exportable theatrical experiences.
- **Encourage an increase in participation from arts organisations in interdisciplinary initiatives:** these should include CoSTAR and the upcoming *Creative Content Exchange*, both of which offer substantial opportunities to the theatre sector. There may be opportunities for UKRI to collaborate more closely with individual organisations and the arts councils to ensure that future initiatives integrate the arts from the earliest stages of their design.

For the Theatre Sector (non-profit, commercial and independent):

- **Develop a bid for a new performing arts cluster:**
Develop a performing-arts-specific bid or become part of a wider creative industries bid to the AHRC *Creative Industries Cluster Programme* (next call opens January 2026, with further waves commissioning over subsequent years).
- **Build research leadership:**
Theatres, sector bodies and UKRI should jointly identify which organisations are best placed to pursue *Independent Research Organisation* (IRO) status. Successful IROs should seek to engage smaller organisations and freelancers in their work, so that additional research capacity benefits the entire sector. Increasing the number of IROs in the theatre sector would foster stronger collaboration between academic and industry partners and enable research with greater impact and policy relevance – for example, by supporting sector-led studies into theatre’s role in policy priorities such as its impact on the economy, youth mental health or safer streets.

For future research:

- **Build on the pioneering work being done by academics and cultural organisations:**
Use the work of pioneers including the Serpentine, the British Council, and Arts Council England to map and analyse how RD&I of all types operates across the arts and the wider creative industries.¹⁰² Strengthen collaboration between research institutions and cultural organisations to ensure research reflects sector realities, leveraging the potential of existing and future IROs in the arts. Consider how intellectual property development and RD&I can be better aligned to inform future policy and funding initiatives.
- **Evolve definitions of RD&I for the arts:**
Building on the work being done by organisations including the Creative Industries Policy and Evidence Centre (PEC), Arts Council England, and the AHRC, explore how existing frameworks – including those used in policy and taxation – could be broadened to capture the distinctive characteristics of artistic and cultural innovation. This work could include the development of a clearer conceptualisation of ‘theatre innovation’, something currently being explored by Professor Gregory Thompson (UCL).

In addition to these recommendations, delivering better support for RD&I across the theatre sector will require the core funders – including UK Government, UKRI, the arts councils, commercial investors, and trusts and foundations – to work together to align their remits and identify opportunities where coordinated action can achieve greater collective impact.

Conclusion

The theatre has always been a space for experimentation and discovery. Yet, as this paper demonstrates, its potential as a site of research, development and innovation remains under-recognised in national policy. This must change. In the face of economic pressures, shifting audience behaviours and rapid technological acceleration, the sector's ability to take risks and explore new frontiers of RD&I will determine its future resilience.

From artistic and technical innovation to organisational and audience-focused experimentation, our research shows that RD&I is already embedded throughout the theatre ecosystem – driving cultural, social and economic impact.

Unlocking theatre's full innovation potential, however, will require systemic change: better alignment across funding bodies, tax and innovation levers, and a shared understanding of how RD&I manifests in the performing arts. Increased investment from government and research agencies, combined with strengthened partnerships between theatres, academia and the wider creative industries, could significantly expand innovation activity – enabling interdisciplinary research and systemic innovation to address major sectoral challenges, from climate impact to emerging technologies and demographic shifts.

UK theatre has as-yet untapped potential to tackle the most existential challenges this country faces, from achieving Net Zero, to driving economic growth, to strengthening social cohesion. We hope this paper represents a first step towards unlocking that potential.

Endnotes

- 1 Economic Impact Assessment of UK Theatre Sector On Behalf of UK Theatre and The Society of London Theatre. Sound Diplomacy, 2023. <https://uktheatre.org/wp-content/uploads/sites/2/2024/01/Economic-Impact-Assessment-of-UK-Theatre-Sector.pdf>; 'How Often Brits Go to the Theatre and Musicals'. Accessed 10 November 2025. <https://yougov.co.uk/topics/entertainment/trackers/how-often-brits-go-to-the-theatre-and-musicals>; 'London's West End: A Cultural and Economic Powerhouse'. SOLT, 3 April 2025. <https://solt.co.uk/londons-west-end-a-cultural-and-economic-powerhouse/>.
- 2 GOV.UK. 'The Value of Public R&D'. Accessed 31 October 2025. <https://www.gov.uk/government/publications/the-value-of-public-rd/the-value-of-public-rd>.
- 3 'UK Research and Innovation'. Accessed 14 August 2025. <https://publications.parliament.uk/pa/cm5901/cmselect/cmpubacc/826/report.html#footnote-081>.
- 4 The Stage. 'Olivier Winners: AI Is Theft and Will Ruin Creative Industries'. Accessed 4 November 2025. <https://www.thestage.co.uk/news/olivier-winners-ai-is-theft-and-will-ruin-creative-industries>; Bashir, Noman, Priya Danti, James Cuff, et al. 'The Climate and Sustainability Implications of Generative AI'. An MIT Exploration of Generative AI, MIT, 27 March 2024. <https://mit-genai.pubpub.org/pub/8ulgrckc/release/2>.
- 5 GOV.UK. '£380 Million Boost for Creative Industries to Help Drive Innovation, Regional Growth and Investment'. Published 23 June 2025. Accessed 10 November 2025. <https://www.gov.uk/government/news/380-million-boost-for-creative-industries-to-help-drive-innovation-regional-growth-and-investment>
- 6 E.g. Andrews, H, and A Hawcroft (eds). 'Why Technology Needs Artists: 40 International Perspectives'. British Council, 2025. <https://doi.org/10.57884/Z34F-0732>; Houde, Nicholas, Tommie Introna, Victoria Ivanova, and Kay Watson. Future Art Ecosystems: Vol 5. Art x Creative R&D. Serpentine, 2025. https://futureartecosystems.org/wp-content/uploads/2025/06/FAE5_Art-x-Creative-RD.25.06.23.pdf?ref=theoverview.art.
- 7 GOV.UK. 'Transformative £86 Billion Boost to Science and Tech to Turbocharge Economy, with Regions Backed to Take Cutting-Edge Research into Own Hands'. Accessed 20 August 2025. <https://www.gov.uk/government/news/transformative-86-billion-boost-to-science-and-tech-to-turbocharge-economy-with-regions-backed-to-take-cutting-edge-research-into-own-hands>.
- 8 The UK's Modern Industrial Strategy 2025. Department for Business and Trade, 2025. <https://www.gov.uk/government/collections/the-uks-modern-industrial-strategy-2025>.
- 9 UK Research and Innovation'. Accessed 14 August 2025. <https://publications.parliament.uk/pa/cm5901/cmselect/cmpubacc/826/report.html#footnote-081>.
- 10 UKRI Strategy 2022-2027 Transforming Tomorrow Together. UKRI, 2022. <https://www.ukri.org/wp-content/uploads/2022/03/UKRI-210422-Strategy2022To2027TransformingTomorrowTogether.pdf>.
- 11 UK Research and Innovation. n.d. Accessed 14 October 2025. <https://www.ukri.org/>; UK Research and Innovation. n.d. Accessed 5 November 2025. <https://www.ukri.org/page/591/>.
- 12 GOV.UK. 'The Value of Public R&D'. Accessed 31 October 2025. <https://www.gov.uk/government/publications/the-value-of-public-rd/the-value-of-public-rd>.
- 13 GOV.UK. 'Meaning of Research and Development for Tax Purposes: Guidelines'. Accessed 23 July 2025. <https://www.gov.uk/government/publications/guidelines-on-the-meaning-of-research-and-development-for-tax-purposes/meaning-of-research-and-development-for-tax-purposes-guidelines>.
- 14 Organisation for Economic Co-operation and Development, Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development (Paris: OECD Publishing, 2015), accessed 10 November 2025, <https://www.oecd.org/sti/frascati-manual-2015-9789264239012-en.htm>
- 15 Organisation for Economic Co-operation and Development, Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development (Paris: OECD Publishing, 2015), accessed 10 November 2025, <https://www.oecd.org/sti/frascati-manual-2015-9789264239012-en.htm>
- 16 Bakhshi, Hasan, and Elizabeth Lomas. 'Defining R&D for the Creative Industries'. AHRC; Nesta; UCL, March 2017.
- 17 Dame Angela McLean and Lord Browne of Madingley. 'The Council for Science and Technology Publishes Advice on Harnessing R&D in the UK's Creative Industries - Letter to the Prime Minister', 5 October 2023. https://assets.publishing.service.gov.uk/media/652fc7ac92895c0010dcb980/Harnessing_Research_and_Development_in_the_UK_Creative_Industries.pdf.
- 18 Cantrell, Tom, Katherine Graham, Mark Love-Smith, and Karen Quigley. Research and Development in British Theatre. 1st edn. Methuen Drama, 2025.
- 19 Bakhshi, Hasan, and David Throsby. Innovation in Arts and Cultural Organisations. 2009. <https://www.culturenet.cz/coKmv4d994Swax/uploads/2016/01/Innovation-in-Arts-and-Cultural-Organisations.pdf>.
- 20 This is inspired by the description of innovation in artform development in Bakhshi, Hasan, and David Throsby. Innovation in Arts and Cultural Organisations. 2009. <https://www.culturenet.cz/coKmv4d994Swax/uploads/2016/01/Innovation-in-Arts-and-Cultural-Organisations.pdf>.
- 21 This idea is currently being explored by Professor Gregory Thompson, UCL.
- 22 Greaves, Dwaynica A., Paola Pinti, Sara Din, et al. 'Exploring Theater Neuroscience: Using Wearable Functional Near-Infrared Spectroscopy to Measure the Sense of Self and Interpersonal Coordination in Professional Actors'. Journal of Cognitive Neuroscience 34, no. 12 (2022): 2215-36. https://doi.org/10.1162/jocn_a_01912.
- 23 'UK Research and Innovation'. Accessed 14 August 2025. <https://publications.parliament.uk/pa/cm5901/cmselect/cmpubacc/826/report.html#footnote-081>.
- 24 Osborne, Gareth. 'Agency and Intra-Textual Co-Creation in Punchdrunk Enrichment's Immersive Story Worlds for Children'. Children's Literature in Education 55 (June 2023). <https://doi.org/10.1007/s10583-023-09533-z>; Queensland Theatre. Artists Masterclass: Making Immersive Work for Young People. Thursday 19 June 2025. Available at: <https://queenslandtheatre.com.au/pd-mc/> (Accessed 10 November 2025).
- 25 'Grenfell: In the Words of Survivors | National Theatre'. Accessed 17 October 2025. <https://www.nationaltheatre.org.uk/productions/grenfell-in-the-words-of-survivors/>; 'London Road | National Theatre'. Accessed 17 October 2025. <https://www.nationaltheatre.org.uk/productions/london-road/>.
- 26 'Connections | National Theatre'. Accessed 17 October 2025. <https://www.nationaltheatre.org.uk/learn-explore/young-people/connections/>.
- 27 'News - Theatre Directors Become Honorary Research Fellows with School of Sociology and Social Policy as Their Latest Collaboration Is Broadcast by BBC Radio - University of Nottingham'. Accessed 22 October 2025. <https://www.nottingham.ac.uk/news/theatre-directors-honorary-research-fellows-collaboration-broadcast-bbc>.
- 28 'Improving Death Investigations to Promote Safety Case Study: Prisoner Deaths'. University of Nottingham, September 2023. <https://www.nottingham.ac.uk/research/groups/prisons-health-and-societies/documents/events/improving-death-investigations-to-promote-safety-policy-brief.pdf>.
- 29 Bakhshi, Hasan, and David Throsby. 'Innovation in Arts and Cultural Organisations', December 2009. <https://www.culturenet.cz/coKmv4d994Swax/uploads/2016/01/Innovation-in-Arts-and-Cultural-Organisations.pdf>.
- 30 'Digital Culture Award Winner Case Study: The Old Vic'. Digital Culture Network, n.d. Accessed 17 October 2025. <https://staging.digitalculturalnetwork.org.uk/knowledge/digital-culture-award-winner>

case-study-the-old-vic/

- 31 RSC. 'Live Performance and Gaming Technology Come Together to Explore the Future for Audiences and Live Theatre'. Accessed 17 October 2025. <https://www.rsc.org.uk/press/releases/live-performance-and-gaming-technology-come-together-to-explore-the-future-for-audiences-and-live-theatre>; Audience of the Future. n.d. Accessed 20 October 2025. <https://www.ukri.org/what-we-do/browse-our-areas-of-investment-and-support/audience-of-the-future/>.
- 32 Mother Ultimate. 'Punchdrunk: Audience of the Future'. Accessed 20 October 2025. <https://motherultimate.com/projects/theatre>.
- 33 'Digital Culture 2019'. mtm, Nesta and Arts Council England, November 2019. <https://media.nesta.org.uk/documents/Digital-Culture-2019.pdf#:~:text=models%20than%20it%20is%20to,per%20cent%3B%20creation%2C%2058%20per>.
- 34 Horváth, Dóra. 'Curtain Call for AI: Transforming Theatre through Technology'. Sustainable Futures 9 (June 2025): 100747. <https://doi.org/10.1016/j.sft.2025.100747>.
- 35 'Curve Neighbour-Hubs'. Curve Theatre, Leicester, n.d. Accessed 4 November 2025. <https://www.curveonline.co.uk/get-involved/curve-neighbour-hubs/>.
- 36 Mitchell, Sam, John Davies, and Richard Turpin. 'Experimenting with Reach: How to Bring Filmed Theatre and Arts Content to New Audiences'. Nesta (blog). Accessed 29 July 2025. <https://www.nesta.org.uk/blog/experimenting-reach-how-bring-filmed-theatre-and-arts-content-new-audiences/>.
- 37 TAIT. 'TAIT | Technology Enabled Storytellers'. Accessed 9 October 2025. <https://www.taittowers.com/work/national-theatre-dorfman-upgrade>.
- 44 'Lifelong Learning in the Creative Industries - Part 1: The Challenges'. Creative Industries Policy and Evidence Centre, 13 December 2024. https://pec.ac.uk/blog_entries/lifelong-learning-in-the-creative-industries-part-1-the-challenges/.
- 45 The Stage. 'Olivier Winners: AI Is Theft and Will Ruin Creative Industries'. Accessed 4 November 2025. <https://www.thestage.co.uk/news/olivier-winners-ai-is-theft-and-will-ruin-creative-industries>.
- 46 Easton, Eliza, John Knell, Amy Vaughan, and Jordan Gibbs. Scene Change: Optimising Business Model Innovation in the Performing Arts. National Theatre, Erskine Analysis and Intelligence Agency, 2025. <https://www.nationaltheatre.org.uk/about-us/research/>.
- 47 'How Often Brits Go to the Theatre and Musicals'. Accessed 10 November 2025. <https://yougov.co.uk/topics/entertainment/trackers/how-often-brits-go-to-the-theatre-and-musicals>.
- 48 The State Of British Theatre In 2025: Growth, Risk And The Urgent Need For Public Investment. Society of London Theatre & UK Theatre, 2025. <https://uktheatre.org/wp-content/uploads/sites/2/2025/05/SOLUTKT-State-Of-British-Theatre.pdf>; 'How Often Brits Go to the Theatre and Musicals'. Accessed 18 September 2025. <https://yougov.co.uk/topics/entertainment/trackers/how-often-brits-go-to-the-theatre-and-musicals>.
- 49 'Redefining Theatre Audiences: The New Faces of Frequent Theatregoers | D E W Y N T E R S'. Accessed 9 September 2025. <https://www.dewynters.com/opinion/redefining-theatre-audiences-the-new-faces-of-frequent-theatregoers/>.
- 50 'New Survey Reveals Why London Audiences Flock To Theatre'. SOLT, 16 September 2025. <https://solt.co.uk/new-survey-reveals-why-london-audiences-flock-to-theatre/>; 'The Emotional Impact of Theatre'. London Theatre Direct. Accessed 18 September 2025. <https://www.londontheatredirect.com/news/www.londontheatredirect.com/news/emotional-impact-of-live-theatre>.
- 51 GOV.UK. 'Main Report for the Participation Survey (April 2024 to March 2025)'. Accessed 9 September 2025. <https://www.gov.uk/government/statistics/participation-survey-2024-25-annual-publication/main-report-for-the-participation-survey-april-2024-to-march-2025>; GOV.UK. 'Main Report for the Participation Survey (May 2023 to March 2024)'. Accessed 9 September 2025. <https://www.gov.uk/government/statistics/participation-survey-2023-24-annual-publication/main-report-for-the-participation-survey-may-2023-to-march-2024>.
- 52 Sweeney, Mark. 'Experiential Entertainment Is Having a Gold Rush but Commercial Success Is Far from Certain'. Business. The Guardian, 19 October 2025. <https://www.theguardian.com/business/2025/oct/19/experiential-entertainment-is-having-a-gold-rush-but-commercial-success-is-far-from-certain>.
- 53 Venue Managers' Survey 2025. Local Theatre Touring Alliance, 2025. <https://localtheatretouringalliance.com/>.
- 54 Raines, Katy, and Kerry Radden. Tomorrow's Audience. Indigo, 2024. <https://s3-eu-west-1.amazonaws.com/supercool-indigo/Tomorrows-Audience-Report-March-2024-c-Indigo-Ltd.pdf>.
- 55 E.g. State of Theatre Access 2023. VocalEyes, Stagertext and the Centre for Accessible Environments (CAE), 2023. <https://vocaleyes.co.uk/research/state-of-theatre-access-2023/>.
- 56 O'Brien, Dave, Mark Taylor, and Ruoxi Wang. Arts, Culture and Heritage: Recent Trends in UK Workforce and Engagement in England. Creative Industries Policy and Evidence Centre, 2025. <https://pec.ac.uk/wp-content/uploads/2025/07/Creative-PEC-Arts-culture-and-heritage-Recent-trends-in-UK-workforce-and-engagement-in-England-06-05-2025-2.pdf>.
- 57 Act Green 2024. Indigo, 2024. <https://www.indigo-ltd.com/resources/act-green-2024-report>.
- 58 Easton, Eliza, John Knell, Amy Vaughan, and Jordan Gibbs. Scene Change: Optimising Business Model Innovation in the Performing Arts. National Theatre, Erskine Analysis and Intelligence Agency, 2025. <https://www.nationaltheatre.org.uk/about-us/research/>.
- 59 Ibid.
- 60 Ibid.
- 61 The Stage. 'Olivier Winners: AI Is Theft and Will Ruin Creative Industries'. Accessed 4 November 2025. <https://www.thestage.co.uk/news/olivier-winners-ai-is-theft-and-will-ruin-creative-industries>; Bashir, Noman, Priya Danti, James Cuff, et al. 'The Climate and Sustainability Implications of Generative AI'. An MIT Exploration of Generative AI, MIT, 27 March 2024. <https://mit-genai.pubpub.org/pub/8ulgrckc/release/2>.
- 62 Creative Industries Sector Plan. UK Government, 2025. <https://www.gov.uk/government/publications/creative-industries-sector-plan>; 'Six Regions Receive £25 Million to Bolster Creative Industries'. Accessed 19 October 2025. <https://www.gov.uk/government/news/six-regions-receive-25-million-to-bolster-creative-industries>.
- 63 Creative Industries Sector Plan. UK Government, 2025. <https://www.gov.uk/government/publications/creative-industries-sector-plan>.
- 64 Backing Your Business: Our Plan for Small and Medium Sized Businesses. Department for Business & Trade, 2025. <https://assets.publishing.service.gov.uk/media/688b1f6f1affb4bedb7b11d/our-plan-for-small-and-medium-sized-businesses.pdf>; GOV.UK. 'AI Opportunities Action Plan'. Accessed 15 October 2025. <https://www.gov.uk/government/publications/ai-opportunities-action-plan/ai-opportunities-action-plan>.
- 65 GOV.UK. 'DCMS Areas of Research Interest'. Accessed 19 October 2025. <https://www.gov.uk/government/publications/dcms-areas-of-research-interest/dcms-areas-of-research-interest>.
- 66 Creative Industries Sector Plan. UK Government, 2025. <https://www.gov.uk/government/publications/creative-industries-sector-plan>.
- 67 Ibid.
- 68 Creative Industries Sector Plan. UK Government, 2025. <https://www.gov.uk/government/publications/creative-industries-sector-plan>.
- 69 35 performing arts organisations were surveyed as part of this research. We are grateful to Arts Council England for sharing this data.
- 70 Easton, Eliza, John Knell, Amy Vaughan, and Jordan Gibbs. Scene Change: Optimising Business Model Innovation in the Performing Arts.

- National Theatre, Erskine Analysis and Intelligence Agency, 2025. <https://www.nationaltheatre.org.uk/about-us/research/>.
- 71 GOV.UK. 'Plan for Change'. 2024. <https://www.gov.uk/missions>.
- 72 'Digital Accelerator'. Bloomberg Philanthropies, n.d. Accessed 6 November 2025. <https://www.bloomberg.org/arts/strengthening-local-arts-organizations/digital-accelerator/>.
- 73 National Lottery Project Grants Information Sheet: Research and Development Projects. Arts Council England, 2023. <https://www.arts council.org.uk/sites/default/files/2023-09/Research%20and%20Development%20and%20Project%20Grants%20-%20Information%20sheet.pdf>.
- 74 XRtists: Supporting the Implementation of Immersive Technologies. 9 May 2023. <https://www.ukri.org/opportunity/xrtists-supporting-the-implementation-of-immersive-technologies/>.
- 75 UK Research and Innovation. n.d. Accessed 8 October 2025. <https://www.ukri.org/>.
- 76 'CaSE Reviews the UKRI Budget Allocations'. CaSE, 10 June 2022. <https://www.sciencecampaign.org.uk/analysis-and-publications/detail/case-reviews-the-ukri-budget-allocations/>.
- 77 Dame Angela McLean and Lord Browne of Madingley. 'The Council for Science and Technology Publishes Advice on Harnessing R&D in the UK's Creative Industries - Letter to the Prime Minister', 5 October 2023. https://assets.publishing.service.gov.uk/media/652fc7ac92895c0010dcb980/Harnessing_Research_and_Development_in_the_UK_Creative_Industries.pdf.
- 78 Research Organisations Eligible for UKRI Funding. 12 November 2024. <https://www.ukri.org/publications/organisation-eligibility/research-organisations-eligible-for-ukri-funding/>.
- 79 'Time To Act | Royal Shakespeare Company'. Accessed 7 November 2025. <https://www.rsc.org.uk/learn/research/current-research/time-to-act>.
- 80 'Time To Listen | RSC Education | Royal Shakespeare Company'. Accessed 7 November 2025. <https://www.rsc.org.uk/learn/research/previous-research/time-to-listen>.
- 81 Our Approach to Social Impact Assessment - Figurative. 24 October 2024. <https://figurative.org.uk/about/our-approach-to-impact-assessment/>.
- 82 Visit [if.rsc.org.uk](https://www.rsc.org.uk) for more information.
- 83 'GtR - Egg Theatre Assembly'. Accessed 6 November 2025. <https://gtr.ukri.org/projects?ref=58478>; 'GtR - Open Access Smart Capture: Immersive Accessibility in Theatre'. Accessed 6 November 2025. <https://gtr.ukri.org/projects?ref=105167>.
- 84 Project Partners, Subcontractors and Collaborators - STFC. n.d. Accessed 22 October 2025. <https://www.ukri.org/councils/stfc/guidance-for-applicants/project-partners-subcontractors-and-collaborators/>.
- 85 Convergent Screen Technologies and Performance in Realtime (CoSTAR). n.d. Accessed 22 October 2025. <https://www.ukri.org/councils/ahrc/remit-programmes-and-priorities/convergent-screen-technologies-and-performance-in-realtime-costar/>.
- 86 GOV.UK. 'UK Innovation Strategy: Leading the Future by Creating It (Accessible Webpage)'. Accessed 17 October 2025. <https://www.gov.uk/government/publications/uk-innovation-strategy-leading-the-future-by-creating-it/uk-innovation-strategy-leading-the-future-by-creating-it-accessible-webpage>.
- 87 What Role Do R&D Tax Reliefs Play in Encouraging UK R&D? The British Academy, Royal Society, Royal Academy of Engineering and the Academy of Medical Sciences, 2019. <https://www.thebritishacademy.ac.uk/publications/rd-investment-what-role-tax-reliefs-encouraging-uk-research-development/>.
- 88 GOV.UK. 'Research and Development Tax Credits Statistics: September 2025'. Accessed 17 October 2025. <https://www.gov.uk/government/statistics/corporate-tax-research-and-development-tax-credit/research-and-development-tax-credits-statistics-september-2025>.
- 89 GOV.UK. 'Meaning of Research and Development for Tax Purposes: Guidelines'. Accessed 23 July 2025. <https://www.gov.uk/government/publications/guidelines-on-the-meaning-of-research-and-development-for-tax-purposes/meaning-of-research-and-development-for-tax-purposes-guidelines>.
- 90 Bakhshi, Hasan. The Art of R&D. Creative Industries Policy and Evidence Centre, 2022. <https://pec.ac.uk/research-reports/the-art-of-r-and-d>.
- 91 'London's West End: A Cultural and Economic Powerhouse'. SOLT, 3 April 2025. <https://solt.co.uk/londons-west-end-a-cultural-and-economic-powerhouse/>.
- 92 'TTR55015 - Calculation: Qualifying Expenditure and Transactions with Connected Parties - HMRC Internal Manual - GOV.UK'. Accessed 17 October 2025. <https://www.gov.uk/hmrc-internal-manuals/theatre-tax-relief/ttr55015>.
- 93 'R&D Tax Credit Calculator. How To Calculate Your R&D Claim'. ForrestBrown, n.d. Accessed 17 October 2025. <https://forrestbrown.co.uk/rd-tax-credits-explained/r-d-tax-credit-calculator/>.
- 94 Creative Industries Sector Plan. UK Government, 2025. <https://www.gov.uk/government/publications/creative-industries-sector-plan>.
- 95 Particular thanks to Professor Hasan Bakhshi for his guidance on this section.
- 96 GOV.UK. 'The Impact of Technology Diffusions on Growth and Productivity: Findings from a Human-Only Rapid Evidence Review'. Accessed 27 October 2025. <https://www.gov.uk/government/publications/ai-assisted-vs-human-only-evidence-review/the-impact-of-technology-diffusions-on-growth-and-productivity-findings-from-a-human-only-rapid-evidence-review>.
- 97 Immersive Arts: Blending the Physical with the Digital. 15 February 2024. <https://www.ukri.org/blog/immersive-arts-blending-the-physical-with-the-digital/>.
- 98 Economic Impact Assessment of UK Theatre Sector On Behalf of UK Theatre and The Society of London Theatre. Sound Diplomacy, 2023. <https://uktheatre.org/wp-content/uploads/sites/2/2024/01/Economic-Impact-Assessment-of-UK-Theatre-Sector.pdf>.
- 99 Creative Industries Sector Plan. UK Government, 2025. <https://www.gov.uk/government/publications/creative-industries-sector-plan>.
- 100 The Stage. 'Olivier Winners: AI Is Theft and Will Ruin Creative Industries'. Accessed 4 November 2025. <https://www.thestage.co.uk/news/olivier-winners-ai-is-theft-and-will-ruin-creative-industries>; Bashir, Noman, Priya Danti, James Cuff, et al. 'The Climate and Sustainability Implications of Generative AI'. An MIT Exploration of Generative AI, MIT, 27 March 2024. <https://mit-genai.pubpub.org/pub/8ulgrckc/release/2>.
- 101 Technology Adoption Review. GREAT Britain & Northern Ireland, 2025. https://assets.publishing.service.gov.uk/media/6857e0995225e4ed0bf3ceb5/dsit_technology_adoption_review_web.pdf.
- 102 E.g. Andrews, H, and A Hawcroft (eds). 'Why Technology Needs Artists: 40 International Perspectives'. British Council, 2025. <https://doi.org/10.57884/Z34F-0732>; Houde, Nicholas, Tommie Introna, Victoria Ivanova, and Kay Watson. Future Art Ecosystems: Vol 5. Art x Creative R&D. Serpentine, 2025. https://futureartecosystems.org/wp-content/uploads/2025/06/FAE5_Art-x-Creative-RD.25.06.23.pdf?ref=theoverview.art.
- 103 'Project Partners, Subcontractors and Collaborators - STFC - UKRI'. Accessed 22 October 2025. <https://www.ukri.org/councils/stfc/guidance-for-applicants/project-partners-subcontractors-and-collaborators/>.

Appendix

Methodology for data analysis of theatre through Gateway to Research

Step 1:

Initial Data Driven Project Selection

- Extracted all projects containing the word '*theatre*' from the UKRI Gateway to Research database.
- Applied a semantic filter to disambiguate between meanings (*theatre of war*, *surgical theatre*, *performance theatre*, *lecture theatre*).
- If the semantic similarity to '*performance arts*' (SS_art) was greater than 0.2, the project was included.
- Where one alternative meaning significantly outperformed others, manual review was conducted to allocate the project appropriately.
- If SS_art was less than 0.2, the project was manually reviewed

Step 2:

Subject-Based Inclusion

- Extracted all projects with a named core subject of '*Drama & Theatre Studies*'.

Step 3 :

Dataset Combination and Filtering

- Combined the two datasets (keyword-based and subject-based).
- Filtered to retain only projects with an **AwardAmount > £100,000**.

Step 4:

Manual Review of Abstracts

Using the project abstracts, we then manually assessed inclusion – including looking at those which had been excluded using the semantic filter – according to the following rules:

• Grounds for inclusion:

- A theatre is a project partner.
- A theatrical performance is an input or output.
- Theatre or theatrical approaches explicitly form part of the methodology.
- The research specifically references its utility in theatres (e.g. COVID-19 studies).
- Biographical projects specify that individuals worked in theatre.

• Not grounds for inclusion:

- 'Theatre' is mentioned only as an exclusion in the description.
- "Theatre" appears in an organisation's name but the organisation is not itself a theatre, and theatre is not otherwise central to the programme (e.g. BECTU).
- The term '*theatre*' is used in another sense (e.g. theatres of war, operating theatres, film theatres) or '*theatrical*' is used only descriptively.
- Theatres are mentioned only in passing (e.g. as one type of building in an archaeological site) and are not a focus or beneficiary of the project.

Step 5: N Gram Analysis

We compared the abstracts and titles of projects from two time periods - an 'Early Set' and a 'Recent Set'.

- Early Set: Projects from 2006-2007 (the earliest data available).
- Recent Set: Projects from 2024-2025.
- Each dataset contains approximately 20 projects.

To identify trending words, we used an N-gram analysis, which examines how often certain words or word pairings appear.

- A 1-gram (unigram) represents a single word (e.g., 'project').
- A 2-gram (bigram) represents two consecutive words (e.g., 'data project').

For this analysis, most meaningful results were 1-grams, so we focused on individual word trends between the two time periods.

Example:

- Take the word 'health':
- In the Early Set, 'health' appeared 0.5 times per project (on average - roughly once every two projects).
- In the Recent Set, 'health' appeared 14 times per project (on average).
- The raw change is therefore $14 - 0.5 = +13.5$, showing a strong increase in prominence over time.

We used this same approach to compare all words across both datasets. Although proportional or normalized comparisons could also be applied, we found that using raw change in frequency offered a simple and transparent way to highlight emerging themes.

Step 6: Analysis of Project Partners

We applied Named Entity Recognition (NER) techniques to the dataset to identify projects that may have listed theatres as either lead or partner organisations. This initial analysis was followed by a manual review conducted by a sector expert to verify whether the identified organisations were indeed theatres. A secondary manual check was then undertaken to confirm each organisation's role in line with UKRI's definitions of lead and project partners.¹⁰³

National Theatre

Commissioned by:
The National Theatre,
Arts Council England
1 December 2025

Authored by:

Erskine Analysis
Eliza Easton
Jessamy Gather

Data analysis:

National Theatre
Jack Maughan

Editorial Support by:

Henham Strategy
Iona Clark
Paige Portal

National Theatre
Matt Armstrong
Alex Bayley
Cristina Diofebbio
Alice King-Farlow
Alex Homfray

Design by:

Studio Simple
Emma Stokes

The Royal National Theatre is
a registered charity no.224223.

Registered Office:
Upper Ground, London SE1 9PX