

## Policy Briefing

# Defining R&D for the creative industries

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### 1.0 Context

The creative industries generate £87.4 billion in Gross Value Added, or 5.3 per cent of the UK's economy. Their economic significance has been recognised in them being one of five sectors first invited to bid for 'sector deals' in the Government's Industrial Strategy Green Paper.<sup>1</sup>

The Green Paper also recognises the essential role of Research & Development (R&D) in driving innovations that "*are the essence of economic growth.*" However, official definitions of Research & Development (R&D) used by governments worldwide exclude the arts, humanities and social sciences. Consequentially, much R&D in the creative industries – which is reliant on the arts, humanities and social sciences – is not recognised and does not qualify for targeted R&D support. As the Government seeks to increase its R&D investment through measures like the new Industrial Strategy Challenge Fund, new Innovate UK programmes and R&D tax relief, it should ensure its R&D definitions do not neglect the very areas where the UK has international strengths, like the creative industries.

This policy briefing is based on research which explores the limitations of official definitions of R&D and proposes a new one to make it fit for purpose for policy delivery across all knowledge domains.<sup>2</sup> The research gathered information through semi-structured interviews, questionnaires and workshops with academics, industry practitioners, funders

and policymakers. The participants of the Digital R&D Fund for the Arts – a three-year programme run by Arts Council England, the Arts and Humanities Research Council (AHRC) and Nesta<sup>3</sup> – provided case studies of a range of R&D as it is delivered in practice across arts and cultural organisations.

As a result of this work, the definition of R&D in the *Frascati Manual* (OECD, 2015 7<sup>th</sup> ed.) was identified as the basis for a unified R&D definition. It was tested and adapted with key stakeholders to produce a revised R&D definition.

## 2.0 Headline findings

The research argues that an R&D definition must have within its scope R&D in all knowledge domains if it is to meet its objectives. In particular, the definition should:

- Recognise R&D as a legitimate practice in the arts, humanities and social sciences, not just science and technology.

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- Make explicit that R&D can lead to the creation of cultural and social value as well as economic value.<sup>4</sup>

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- Provide a basis on which policymakers can build a framework to measure and evaluate the return on investment from all R&D, as is the case with science and technology R&D.

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- Aid knowledge creation which involves collaboration across all knowledge domains delivering R&D.

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- Encompass knowledge creation which involves production of experiences and behavioural change as well as that which produces products.

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- Acknowledge that R&D can address aleatory uncertainty – natural uncertainty which is not fully resolved through experimentation – and complex forms of epistemic – i.e. systematic – uncertainty in addition to uncertainty that is more straightforwardly defined.

## 3.0 Priorities

An urgent priority is to devise methods for measuring and evaluating the return on investment in R&D in the arts, humanities and social sciences. This work should relate clearly to the existing survey-based methodologies that are used by policymakers to evaluate science and technology R&D across the world.

Whilst it is often accepted in the UK that arts, humanities and social sciences research can lead to innovation,<sup>5</sup> to date this work has not proposed formal R&D definitions and metrics. As such, the UK government risks missing out on maximising the innovation which could be delivered were R&D in all knowledge domains recognised. Consistent measurement across all R&D would enable greater recognition of the value of R&D for sectors such as the creative industries. In addition, this would clearly better position the creative industries within a range of UK policy initiatives aimed at boosting UK innovation.

## 4.0 UK position on the official definition of R&D

Within the context of science and technology, an R&D definition first agreed by the Organisation for Economic Cooperation and Development (OECD) countries in 1963 and published in the *Frascati Manual*,<sup>6</sup> has over the years given rise to measurement and various public funding structures for R&D, including subsidies and tax breaks. The Manual is recognised and utilised internationally for statistical measurement.

Historically, the *Frascati Manual* R&D definition has been explicitly aligned with positivist epistemologies which exclude other research paradigms. It discusses knowledge as a fixed bankable asset ('stock') rather than one which is questioned and reinterpreted through new knowledge creation. The Manual, whilst expanding in the later editions to acknowledge that R&D does occur across some arts, humanities and social sciences knowledge domains, still needs to rebalance its emphasis on science and technology and further widen the scope of its R&D definition. The extension of the definition is limited and some aspects of R&D delivery are confined to science and technology examples.

In the UK, Her Majesty's Revenues and Customs (HMRC) in establishing the criteria for R&D tax reliefs, applies the definitions of R&D set out in the UK's *Generally Accepted Accounting Principles*<sup>7</sup> that draw on the *Frascati Manual*. However, HMRC also requires that the R&D relates to scientific or technological delivery despite the Manual's wider scope. The arts, humanities and social sciences whilst having the capacity to deliver R&D against the definition and being of great significance to the creative industries, are specifically excluded for HMRC's purposes. Much of the work in these domains is not measured despite its connection to innovation.<sup>8</sup> The HMRC Guidelines state "*Science is the systematic study of the nature and behaviour of the physical and material universe. Work in the arts, humanities and social sciences, including economics, is not science for the purpose of these [HMRC] Guidelines.*"<sup>9</sup> HMRC further explains that where the relief may cover "*development work in design*", that is only insofar as it "*involves overcoming difficult technological problems.*"<sup>10</sup>

Proper statistical measures of R&D within the arts, humanities and social sciences would provide a clearer and more rigorous basis on which HMRC could reconsider its position. Furthermore, a unified R&D definition across all knowledge domains (the arts and humanities, social sciences, science and technology etc.) would enable greater cross-disciplinary knowledge exchange in line with current Government initiatives such as the Industrial Strategy Challenge Fund. At a time when the UK is reviewing its sources of international comparative advantage this could prove a significant boost to the economy given the strength of its creative industries.<sup>11</sup>

## 5.0 Primer on the official definition of R&D

The latest edition of the *Frascati Manual* (OECD, 2015, p.44-45) defines Research and Experimental Development as:

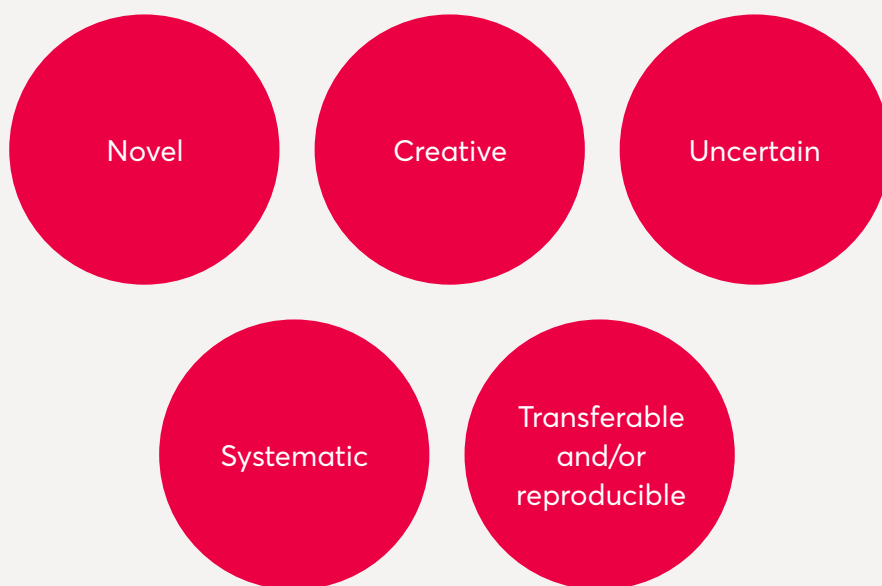
*"Research and experimental development (R&D) comprise creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge."*

The definition of R&D is explained by three sub-definitions which state that (OECD, 2015, p.45): *"Basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view.*

*Applied research is original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific, practical aim or objective.*

*Experimental development is systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products or processes or to improving existing products or processes."*

Further requirements underpin the existing high-level *Frascati Manual's* (OECD, 2015, p.45) definition of R&D, namely that the R&D activity must meet the following five criteria:



'**Novel**' relates to building new knowledge and '**creative**' requires there to be an intentional objective to acquire new knowledge through R&D. The *Frascati Manual* (OECD, 2015, pp.47-49 and p.81) deals with '**uncertainty**' in only a minimal way. Whilst there may be epistemic uncertainty in a range of R&D activities, the *Frascati Manual* uses the five criteria to exclude what it determines as routine activity. Epistemic uncertainty must be combined with all the other attributes which underpin the definition in order to rule out, say, simple software fixes as a form of R&D. However, the *Frascati Manual* does not recognise the challenge of resolving epistemic uncertainty which characterises complex networks of cause and effect.

Nor does the *Frascati Manual* deal at all with aleatory uncertainty. 'Systematic' is defined within the *Frascati Manual* (OECD, 2015, p.49) as 'planned and budgeted'. Systematic within the context of the wider scientific literature, however, has a more rigid definition which implies a precisely defined approach to research to minimise bias,<sup>12</sup> but this is not intended in the *Frascati Manual*.

Finally, the requirement that research should be '**transferable and/or reproducible**' within the *Frascati Manual* (OECD, 2015, p.48-49) refers to the requirement that new knowledge does not remain tacit but is conveyed to others, for example in a peer reviewed academic article. However, the examples given in the Manual are very limited. For instance, a new research-based design or artwork may be displayed and interpreted within the context of an exhibition in a way that arguably performs the same function of providing a vehicle for knowledge transfer as that of a journal article. In other cases, creative practice – such as in performance art – may be geared at creating valuable knowledge which is highly context-specific and therefore neither transferable nor reproducible in the conventional sense of the words. However, the Manual in any case excludes performance on the basis that it is seeking new expression rather than new knowledge, though this is not necessarily the case.

The latest iteration of the *Frascati Manual* has tried to extend the definition of R&D to include a wider range of knowledge domains more overtly. It acknowledges that basic research, applied research and experimental development are carried out in a range of disciplines, including art history, musicology, theatre studies and literature.

Whilst the *Frascati Manual* has been critiqued, it remains the model used by governments internationally to recognise and account for R&D activity. Many aspects of R&D delivered by the arts, humanities and social sciences do align with the definition although some types of R&D are excluded.

## 6.0 Towards a holistic definition of R&D

The current R&D definition delivered by the *Frascati Manual* aligns with only a subset of arts, humanities and social science research undertaken. The requirements for R&D to be 'novel' and the allied property for it to be 'creative' are discussed by Still and d'Inverno who see this understanding of creativity as a 1950s construct aligned to the ideas of productivity and measurement as opposed to ideas around creativity in the context of imagination and change.<sup>13</sup> To more fully recognise R&D as it is undertaken across the arts and culture, for example, the definition would need to recognise that delivery of experience as well as products is significant. In addition, R&D may lead to enhanced understanding of behaviours and influences change in people as well as in differentiated or new products. The current limited recognition of the range of uncertainty is also a problem, but not only for the arts, humanities and social sciences but for the sciences and technology too.

As a definition for policymakers, R&D must ultimately deliver 'value' – innovations ("*ideas successfully applied*"<sup>14</sup>) – albeit this will be judged in a range of ways. However, it is important to recognise the contributions R&D makes not just to the economy but to culture and society. The definition also needs to take account of the delivery models for R&D – across knowledge domains – which include individuals, SMEs, collaborations and networks as well as large companies with R&D labs.

Below we propose a new unified R&D definition for all knowledge domains which has been tested and evolved with key stakeholders as part of the research which forms the basis for this policy briefing. The additions to the Frascati definition are denoted in yellow and the deletions are denoted in red.

## Proposed R&D definition for all knowledge domains

**Research and experimental development (R&D)** comprise 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 economic, cultural or social value** of available knowledge.

**Basic research** is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena, observable facts and **behaviours**, without any particular application or use in view.

**Applied research** is original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific **intended practical** aim or objective.

**Experimental development** is systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products, **experiences** or processes or to improving existing products, **experiences** or processes.

## 7.0 Further information

Additional information is available from:

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## Endnotes

1. HM Government (2017) 'Building our Industrial Strategy Green Paper.' [https://beis.gov.uk/citizenspace.com/strategy/industrial-strategy/supporting\\_documents/buildingourindustrialstrategygreenpaper.pdf](https://beis.gov.uk/citizenspace.com/strategy/industrial-strategy/supporting_documents/buildingourindustrialstrategygreenpaper.pdf)
2. The policy briefing is based on research undertaken by Dr Elizabeth Lomas, UCL for the Arts and Humanities Research Council (Grant Number: AH/L503988/1). <http://www.ahrc.ac.uk/documents/project-reports-and-reviews/digital-r-d-final-report/> That research in turn builds on previous work by Hasan Bakhshi and colleagues e.g. Bakhshi, H., Desai, R. and Freeman, A. (2010) 'Not Rocket Science: A Roadmap for Arts and Cultural R&D, Mission Models Money.' See: [http://www.missionmodelsmoney.org.uk/sites/default/files/23974477-Not-Rocket-Science-Hasan-Bakhshi-et-al-2010\\_0.pdf](http://www.missionmodelsmoney.org.uk/sites/default/files/23974477-Not-Rocket-Science-Hasan-Bakhshi-et-al-2010_0.pdf)
3. <http://www.artscouncil.org.uk/creative-media/digital-rd-fund-arts-2012-15>
4. Crossick, G. and Kaszynska, P. (2016) 'Understanding the value of arts & culture.' Swindon: AHRC. See <http://www.ahrc.ac.uk/documents/publications/cultural-value-project-final-report/>
5. For example, see the Department for Innovation, Universities and Skills innovation strategy published as 'Innovation Nation' in 2008. See: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/238751/7345.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/238751/7345.pdf). Also, AHRC (2009) 'Leading the world: the economic impact of UK arts and humanities research.' See: <http://www.ahrc.ac.uk/documents/publications/leading-the-world/>
6. All further citations and discussions are taken from the latest edition of the 'Frascati Manual' - OECD (2015) 'Frascati Manual: proposed standard practice for surveys on research and experimental development.' Paris: OECD, 7<sup>th</sup> edn.
7. <https://www.frc.org.uk/Our-Work/Codes-Standards/Accounting-and-Reporting-Policy/Standards-in-Issue/SSAP-13-Accounting-for-research-and-development.aspx>
8. The Royal Institute of British Architects (RIBA), when explaining to its members how to structure their work to take advantage of tax reliefs notes the limitations of the current system. See James, M. (2012) 'The UK research and development tax credit scheme - a guide for architects.' London: RIBA.
9. <http://www.hmrc.gov.uk/gds/cird/attachments/rdsimpleguide.pdf>
10. <http://www.hmrc.gov.uk/gds/cird/attachments/rdsimpleguide.pdf> Tether and Benaim (2016) also argue that design plays a much wider role in innovation processes than recognised by the 'Frascati Manual.' <http://www.cre8tv.eu/wp-content/uploads/2013/06/DL-1.0.5-R.pdf>
11. The significance of the creative industries to the UK economy compared with its competitors is outlined in the work of Nathan, M., Pratt, A. and Rincon-Aznar, A. (2015) 'Creative economy employment in the EU and the UK a comparative analysis.' London: Nesta. See <http://www.nesta.org.uk/publications/creative-economy-employment-eu-and-uk-comparative-analysis>
12. Higgins, J. and Green, S. (eds.) (2008) 'Cochrane handbook for systematic reviews of interventions.' Version 5.0.0. London: The Cochrane Collaboration.
13. Still, A. and d'Inverno, N. (2016) 'A history of creativity for future AI research', The Seventh International Conference on Computational Creativity, 27 June -1 July 2016, Paris.
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