Design Council

Four ways that government can make better use of design to increase R&D

#DesignIsVital

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We were pleased to see references to design in the government's recently published Research and Development (R&D) Roadmap that sets out the UK's vision and ambitions for science, research and innovation. As the roadmap implies, there is no one way to increase investment in R&D, but our evidence tells us that design is often a key yet overlooked ingredient and plays a major role in innovation.

We believe that government can go much further in recognising, promoting and testing to see how design can be used to increase investment in R&D, including introducing the following measures to maximise its benefit:

1. Invest in design-led programmes for business that drive innovation
2. Explore the enablers and boundaries of how we consider R&D
3. Invest in design skills for current and future workforces
4. Take a design approach to implementing the R&D roadmap

01

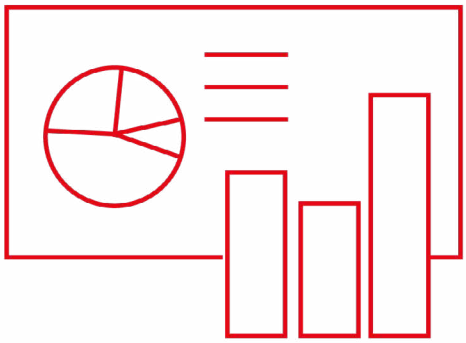
Invest in design-led programmes for business that drive innovation

Design is the link between R&D and application. Our research shows that design applied to science and technology research accelerates commercialisation and increases value (Innovation by design, 2015) and that organisations that invest in design also invest in R&D (Design Economy 2018 – summarised below). Design management skills are critical to bringing together multidisciplinary teams – across science, business, public sector and lived experience. Designers play a translation role.

For greater innovation and a more resilient UK economy, we need businesses to use design to maximise their performance. Evidence from our programmes shows that businesses that use design perform better than those that do not:

- Some 91% of businesses that we supported during the 2008 through our Designing Demand programme were surviving five years on, compared to 49% of the control group.
- Every £1 invested in design creates £20 in increased revenues, over £4 increase in net operating profit and over £5 in increased export (Designing Demand).

But 20% of businesses are not using any design at all (Design Economy 2018), with SMEs particularly being less inclined to do so. The 2019 UK Innovation survey shows an overall dip in innovation, that SMEs continue to be less innovative than bigger firms, and that process innovation lags behind product innovation.



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These areas need attention through targeting of policies at areas where we could soonest accelerate innovation. SMEs are the lifeblood of this country: they provide meaningful work which binds local communities and strengthens local economies. COVID-19 has hit them hard. Design – as the link between creativity and innovation – can support them not just to survive, but also emerge in ways which promote productivity and enable employment. And do so in ways which support the health and wellbeing of their staff, enable them to act regeneratively, help achieve net zero targets, and harness the potential of local designers and young local talent.

The current business support landscape is fragmented: there are design-led business support offers in Northern Ireland and Wales, but none in England. Building on our evidence of the value of design business support programmes (Designing Demand), we have been conducting research into the SME need for design support and their appetite for design-intensive research and innovation. We conclude that that there is a need for a new business support offer.

Our vision is for all SMEs to use design as a matter of course, as a fundamental business skill, so that they can be engines of economic as well as social and environmental good. We propose to create a network of place-based design support for business, using evidence-based best practice to set the overall support framework, and match up local designers and university students with local businesses, creating sustainable local innovation ecosystems that can thrive during uncertain times.

As well as focusing on individual businesses, our evidence demonstrates the social and economic benefits of investing in design-intensive research and innovation programmes that create new partnerships between universities, industry, designers and the public sector. This is likely to increase the commercial application of design research (as evidenced by our past Innovate for Universities programme), and our recent research for the Arts and Humanities Research Council (AHRC) demonstrated appetite for such a programme across industry, public sector and academia.

02

Explore the enablers and boundaries of how we consider R&D

We know that design is a vital part of, and a ladder to, research and development. Adopting a design approach can help establish the right mindset, ways of working and skills, acting as a pre-condition to investing in R&D and boosting 'R&D readiness'. Design opens the door to R&D: for those who can't jump quickly into becoming an R&D business or organisation (such as for SMEs), design kickstarts the process of innovation.

We welcome the Roadmap's call for social research into how and when society wants to use innovation: we are currently conducting qualitative research with SMEs into how they want to use design and innovation, and with businesses into how they want to invest in innovation. We would encourage government also to invest in research that enables better understanding of the 'stepping stones to R&D' that could be invested in – such as design.

We think there is also an opportunity to move further faster with a 'stepping stones to R&D' business support programme that undertakes action research through 'test and learn' programmes. These can support businesses to apply research through design bringing together a cohort of businesses to learn how this happens and sharing this learning. We are currently working on two similar programmes: developing a commercial organisation that can support other organisations (such as developers) translate research into age-friendly environments into age-friendly places (in Manchester); and working alongside Wellcome's Evidence Accelerator with Guy's & St Thomas' Charity to support local employers to use design to apply evidence of employee health and wellbeing. This research will then be is shared with the wider system.

We also believe that insights from better understanding the 'stepping stones to R&D' could feed into consultations about widening the definition of R&D (such as Treasury's current review of R&D definitions in its tax incentives) and therefore enable greater investment in innovation. For example, ogranisations such as Nesta and the Creative Industries Federation have called for a move to think beyond primarily about science and technology in R&D and consider definitions more applicable to the creative industries. We support this and think similar measures could that enable greater use of design.

+ and (+) represent statistically significant relationships, + the more significant of the two,
- represents no statistically significant relationship, t = time

03

Invest in design skills, for our current and future workforce

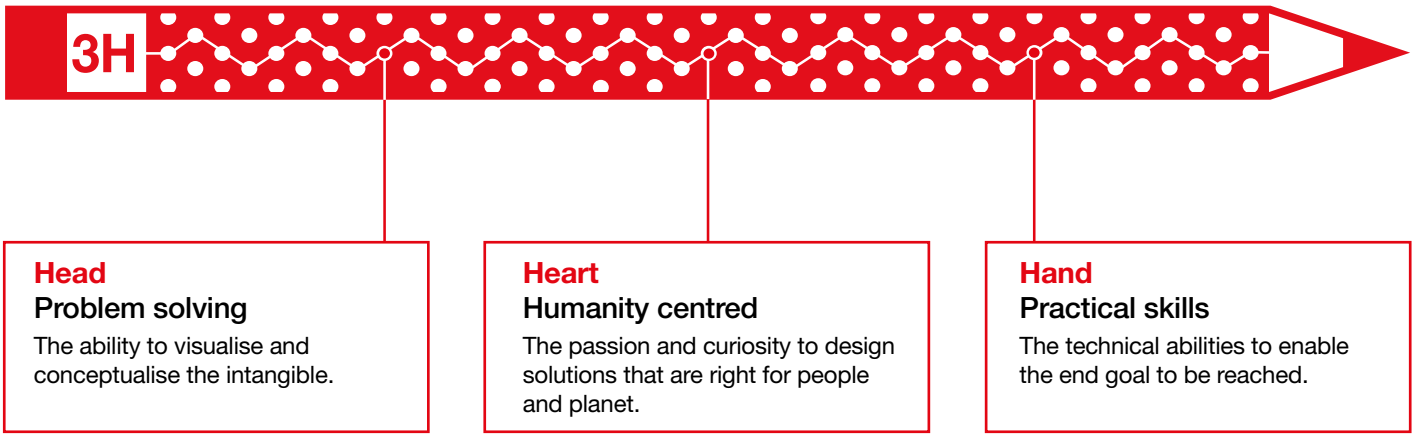
Investing in the right skills throughout life, from primary schools through to adult and in work training, will deliver more widespread innovation through our society and economy.

Designing a Future Economy (2017) shows that workers which use design skills are £10 per hour more productive than those who don't; and that 43% of workers using design skills are more likely to be in jobs requiring and generating innovation (compared with an average for the wider UK workforce of just 6%).

We know, though, that the key skills for innovation, such as critical thinking, ideation, complex problem solving, visualisation, making skills, creativity and collaboration, are not being taught widely enough. Indeed, the GCSE design and technology course has shrunk by over 75% since 2001, from over 400,000 pupils to fewer than 100,000 in 2019. While the skills we think are crucial can be taught across a range of subjects and disciplines, the decline in design and technology is symptomatic of the way that 'soft skills' are falling out of the curriculum. If this emerging skills gap is not addressed, it could have a detrimental effect on innovation which could last for decades.

At the same time, we cannot underestimate the value of reskilling and upskilling the current workforce. The downside of automation is the potential loss of many roles, including some higher-skilled roles as well as those less skilled. While we do expect many new roles to be created through automation, the economy cannot thrive if we don't have the necessary skills. The World Economic Forum has published various reports which highlight the skills that people will need in future, and these prominently feature the skills most commonly used in design and innovation.

Government schemes that seek to retrain and provide new skills, such as the National Retraining Scheme, the National Skills Fund, and the Shared Prosperity Fund, should all focus on embedding these skills across the UK. This would support both the government's levelling up agenda, as well as the push for greater inclusion and diversity within the objectives of the R&D Roadmap. Without them, businesses and the public sector will struggle to innovate and keep up with the pace of global change.




new ways

04

Take a design approach to implementing the R&D roadmap

We welcome the frequent references in the R&D Roadmap to making the most of emerging insight, 'test and learn' opportunities and considering change at a systems level. However, given the ambitions of the 2.4% R&D target and extensive series of workstreams that will need to operate across different part of local and national government as well as other sectors, government need to think carefully about the infrastructure and skills it needs to put in place now to make the most of this opportunity.

Drawing on our own experience as well as recent evidence on the social and economic benefits of design in policymaking (AHRC Design Fellows Challenges of the Future: Public Policy, 2020), we believe that there is an important role here for the use of design skills and approaches (Design perspectives - Design skills, 2020).

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How design contributes to innovation and greater investment in R&D

There is a growing body of evidence on the relationship between design, innovation and R&D.

As defined within the Cox Review (2005) design is the process that connects creativity with innovation: 'Creativity' is the generation of new ideas. 'Innovation' is the successful exploitation of new ideas - it is the process that carries them through to new products, new services, new ways of running the business or even new ways of doing business. 'Design' is what links creativity and innovation. It shapes ideas to become practical and attractive propositions for users or customers. Design may be described as creativity deployed to a specific end.

Understanding Design-Intensive Innovation (2017) concluded that design should be considered both as a process and an outcome which has a distinctive and often determining role in innovation. The literature review concluded that design makes the difference between routine and radical innovation, or between low and high benefits to suppliers and customers of goods and services (in physical product design and service innovation).

Analysis of the UK Innovation Survey shows engagement with design increases the probability that firms will undertake both product/service and process innovation; and multivariate analysis finds design is ranked third as a driver of innovation, close behind having an R&D budget and staff (Design Economy 2018).

We also know that design is a vital part of, and a ladder to, research and development.

- Our analysis shows that when firms invest in design[1], they are more likely to invest in other intangible assets such as R&D (Design Economy 2018).
- More than four-fifths of organisations with any R&D functions or facilities (85%) have some design functions or facilities, while 50% of those with any design functions or facilities have some R&D functions or facilities.[2]
- Organisations with R&D and/or design functions in-house are also significantly more likely than those without them to report growth in employment in the last three years.

Nearly three in four participants in our Designing Demand business innovation programme either agreed or strongly agreed that the programme had changed the culture of their organisation into one that was more design focused.

1 In 2015, UK firms invested £14.7bn in design (total spending on R&D in 2015 by business was £20.9 billion [latest figures show that in 2018, business spent £25billion] – this is 66% of total expenditure performed in the UK).

2 Organisations are more likely to have individual staff employed or trained in design functions than to have a specific design department or unit as such. Furthermore, they may not have a department or unit, but still have a budget specifically for design and R&D. While the lack of a specific department or unit suggests a less formal approach to addressing design functions within an organisation, having a budget in place is indicative of a formally recognised and defined activity.

We understand design can be a way to open-up more organisations to the value of R&D. Adopting a design approach can help establish the right mindset, ways of working and skills, acting as a pre-condition to investing in R&D and boosting 'R&D readiness'. For example, central to a design process is to conduct research, test and iterate. The 'discovery' phase encourages exploring the issue at hand more widely and deeply, including promoting greater use of research with the people affected by the issue. Core to the whole design process (but particularly relevant to delivery) is encouraging making, testing and iterating different solutions at small-scale, rejecting early ideas that won't work and improving those that will.

From our design programmes, we can see evidence of this shift in mindset and the impact it has on entrepreneurs and businesses. Evaluations of our Spark and Transform Ageing programmes with entrepreneurs show that teaching design techniques encourages greater use of user and market research, as well as greater confidence in using prototypes and continuous testing of products. Nearly three in four participants in our Designing Demand business innovation programme either agreed or strongly agreed that the programme had changed the culture of their organisation into one that was more design focused.

Furthermore, our broader evidence shows that design is linked to greater productivity, resilience and entrepreneurialism (e.g. Making Life Better By Design, 2020).

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About Design Council

Design Council's mission is to make life better by design. We work with people to create better places, better products and better processes, all of which lead to better performance. We commission pioneering evidence-based research, develop groundbreaking programmes and deliver influencing and policy work to demonstrate the power of design and how it impacts three key areas of the economy: business innovation, places and public services. We bring together non designers and designers from grassroots to government and share with them our design expertise to transform the way they work.