



Innovate
UK

Design in innovation strategy

2020-2024





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Foreword



Take a good look around you. Almost everything that you can see or might use, from manufactured household or office goods, electrical items and furniture, to the services and apps on your smartphone, computer or TV and even the built environment around you, has been designed –

either consciously or by default. The extent to which we love (or dislike) those things, and whether they help or hinder us in our daily lives depends, to a great extent, on the consideration and expertise that has gone into their design.

Innovate UK’s vision is for the UK to be among the very best places in the world for businesses to grow and maximise their positive economic, societal and environmental impacts. This is encouraged through investing in innovation and giving businesses of all sizes and in all sectors access to the investment, knowledge, partners and markets they need. As the Covid-19 pandemic of 2020 shows, there has never been a more important time for the UK to be innovative in the face of whatever challenges arise, and to ensure that the benefits of innovation are shared by all.

These benefits are likely to be greater and longer lasting if businesses consider the people they are innovating for, as well as the technology needed to realise their ideas. There needs to be demand as well as supply, and great, human-centred design can provide businesses with the tools and professional skills necessary to achieve this.

It is for this reason that our Design in innovation strategy has been updated. Over the last five years, our programmes of investment and support for design have produced impressive results. However, more can be done – despite the UK’s enormous strengths in design, there remains a significant opportunity for more businesses to exploit that potential: recognising, adopting and investing in the best quality design to innovate more effectively, compete successfully and grow faster. As this Strategy demonstrates, for those businesses and organisations that truly embed design into their innovation processes and strategies, the potential benefits are considerable.

Innovate UK is at the forefront of the government’s commitment to increase public and private investment in R&D activities. By ensuring that this is integrated with design, the likelihood of success will increase, boosting the return on our own investments and helping to bring wider, long-term outcomes for the whole country. In short, design creates value. This Strategy is an important part of helping to make this happen and sets out how, with our industry and public partners, the fusion of technology and great design can be encouraged to power world-class innovation.

Dr Ian Campbell, Executive Chair, Innovate UK

Benefits are likely to be greater and longer lasting if businesses consider the people they are innovating for, as well as the technology needed to realise their ideas.

Executive summary

For the UK to thrive in the face of change, it will need to generate new ideas and continue to be home to innovative companies and researchers solving challenges. But the success of any innovation ultimately depends on the behaviour and decisions of people, and it is here that great design becomes crucial. Effective innovation requires more than technical research and development: it must also include design activities to create solutions that are better, more desirable and fit-for-purpose.

For this reason, Innovate UK published its first Design in innovation strategy in 2015. This updated Strategy builds on this in order to achieve greater impact. It recognises the distinctive characteristics of a human-centred approach as well as the variety of design methodologies that are used to put people at the heart of the innovation process. The benefits of such an approach are clear: in the profitability and long-term performance for business, but also in terms of wider social and environment outcomes, in which designers are taking an increasingly leading role.

The UK is a recognised centre for design excellence and there are clear opportunities for businesses to create greater value through design by embedding it as a process, managing it more effectively and adopting it as a strategic differentiator. However, the uptake of design could still be higher and significant barriers remain in terms of knowledge, resources and business capacity if the UK is to exploit the full potential of its design capability.

Over the next four years, we will address these barriers through an ambitious, targeted and well-managed programme of investment, championing and support, which will be structured under four themes that meet recognised business need:

- Making the case for investment in design
- Reducing the cost of entry for those new to design
- Helping businesses access the best design talent
- Helping businesses maximise the value contribution of design

The programme will include dedicated grant funding as well as broader initiatives, with all interventions assessed against our success criteria in order to deliver value. We will work with industry partners and across government to fully embed design in innovation, and ensure that the country’s world-class designers maximise their contribution to fostering sustainable economic growth.

Effective innovation includes design activities to create solutions that are better, more desirable and fit-for-purpose.

Context for this strategy



The importance of people in innovation

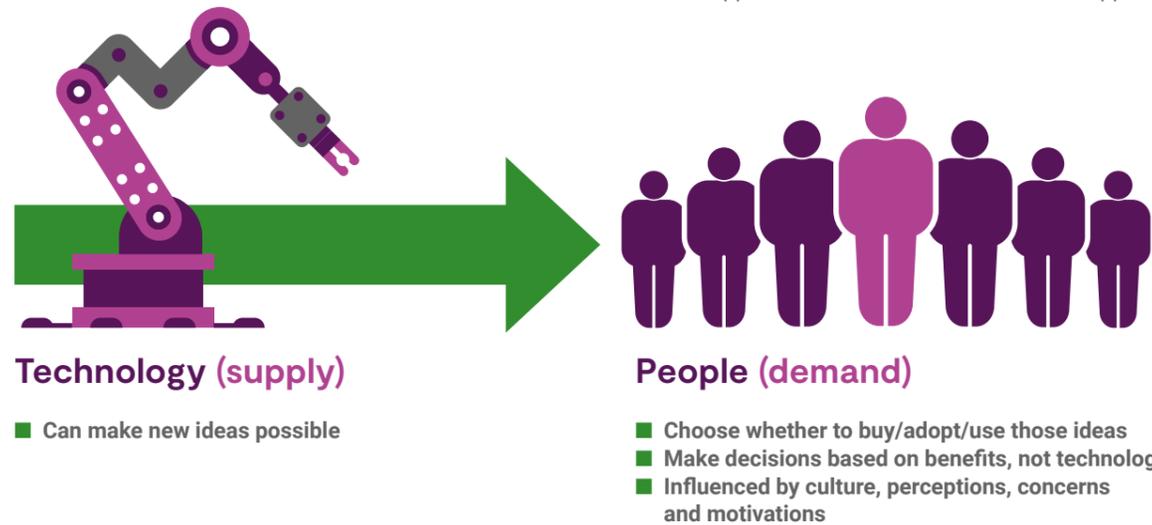
The world is an uncertain place. As the outbreak and spread of the Covid-19 virus has powerfully demonstrated, change can happen with devastating speed. At the same time, albeit less visibly, there are profound global trends at work, ranging from the climate crisis to technological disruption, from demographic change to evolving social attitudes. The UK's ability to thrive in the face of change, in whatever form it takes, will depend on ideas, with innovative companies and researchers solving challenges and driving a productive economy.

Whilst advances in technology can turn those ideas into reality, the benefits will only be realised if they are adopted and used by people – whether as citizens, consumers or businesses. Ultimately, the success of any new idea depends on human behaviour and decisions. Technology enables supply, but people determine demand. Successful innovation requires both to be aligned, and it is here that design is crucial.

In today's economy, characterised by digital purchasing, social media and a plethora of communication channels, customers have more choice and influence than ever before. Satisfying their expectations is the minimum standard. To stand out from the crowd, companies must exceed expectations and delight customers – remembering that people don't buy technology; they buy what it does for them.

Great innovation extends beyond technical research and development. It also includes the wide range of activities required to firstly understand users, and then translate this into better, more desirable and fit-for-purpose solutions. As we move from an economy based on the ownership of commodities towards one that places greater value on experiences, it has never been more important to put people at the heart of the innovation process. Some of today's most successful companies are going further still, fuelling their people-centred innovation culture with unprecedented behavioural insight and data, and in the process building deep and lasting customer relationships.

It is within this context that many businesses could benefit from the greater use of human-centred design methods, and from the skills of design professionals. The UK is justly renowned for its world-class design talent, but more businesses could benefit by exploiting the potential of human-centred design to create value. This Strategy sets out the approach we will take to address that opportunity.



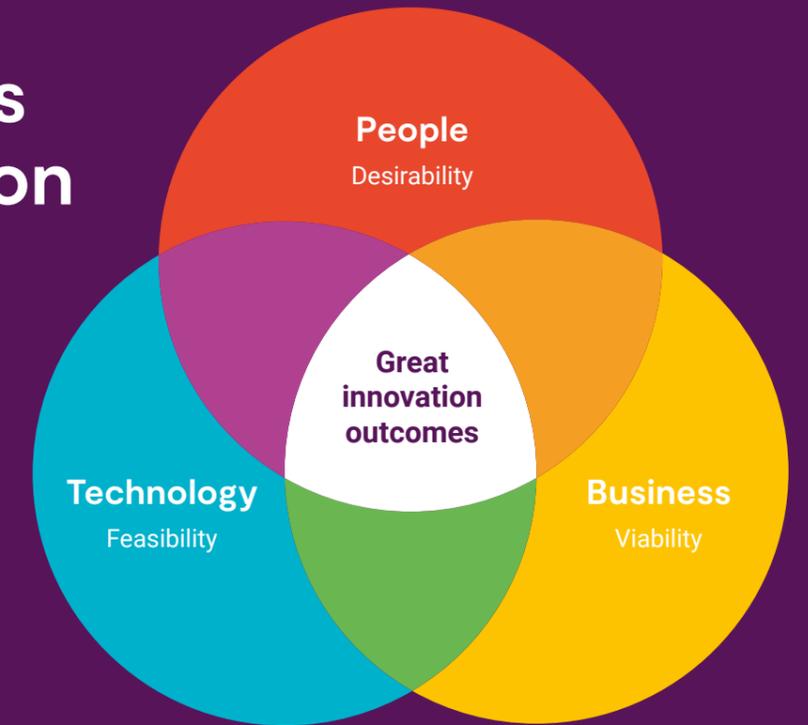
Three lenses for innovation

Great design means putting the needs, wishes and behaviours of people at the heart of the innovation process so that new ideas are truly desirable as well as being technically feasible and financially viable.

Desirability
What do people desire?

Feasibility
What is technically feasible?

Viability
What is financially viable?



Understanding people is important for innovators because, whilst technology can make new ideas possible, people determine whether or not they're successful.



Our ambition: scaling impact and refining the approach

Innovate UK published its first Design in innovation strategy in 2015. Since then, we have raised awareness and understanding of design and promoted best practice through activities such as the Design in Innovation Awards. We have supported research reports with partners such as the Design Council and Royal Society of Arts (RSA), and brought together the design and technology communities, working with the Knowledge Transfer Network (KTN), the Design Museum and others.

Alongside this advocacy and networking has come significant investment, with £6 million of match funded grants delivered through the Design Foundations competitions, which have enabled over 150 early-stage, human-centred design studies. In addition, design has become better embedded across Innovate UK funding as an allowable cost within Smart and Industrial Strategy Challenge Fund competitions and other programmes. We have also piloted new design support mechanisms, including mentoring initiatives and mandatory human-centred design studies as a gateway to subsequent R&D funding opportunities.

Many more businesses could benefit from a better understanding and use of human-centred design.

The aim of this updated Strategy is to build on this success with a refreshed and enhanced approach informed by learnings. It recognises that while support interventions have proven effective, they have only reached a small percentage of the tens of thousands of businesses that Innovate UK help each year. Many more of them could benefit from a better understanding and use of human-centred design.

Given this business need, the ambition is to significantly scale-up the reach and impact of our design programme over the next four years. In so doing we need to refine our interventions and investment criteria, with an awareness of the differing characteristics of design and technical R&D, while maintaining an understanding of how both activities fit within an innovation journey.



Reviewing the impact of Design Foundations grant funding

The Knowledge Transfer Network commissioned FutureGov and BMG to carry out a review into the impact of the Design Foundations grant funding competition. Their interim findings are based on a combination of quantitative surveys and qualitative interviews carried out with funded companies at the start of their projects and again once projects had finished. The companies will be contacted again in 2020, to investigate longer-term impact. At the end of their 3-9 month funded projects, companies reported:

- better understanding of customers and opportunity space
- new business model and organisational innovation
- improved product and service designs
- increased investment readiness

In terms of organisational culture, there was strong evidence of:

- a change in attitude to and use of design
- a change in attitude to innovation and innovation processes
- more consistently effective innovation processes
- more divergent thinking
- increased investment in design

Overall, the interim review concluded that:

- “The perception of design changes through this programme – it is de-risked, mainstreamed, and more likely to form part of a company’s processes in the long term.”
- “Companies are in a better position to apply to other funding sources and attract more investment.” and that “after two years, we expect to see companies generating greater economic value from their products and services as a result of new innovation processes that involve early-stage design activities.”

As little as nine months after project completion, many companies had already reported tangible business improvements – some representing a greater than ten to one return on investment. For example:

- **SensEye** have won additional sales contracts worth in excess of £1 million, and recruited a head of UX design
- **Entia** have hired nine additional staff and developed and launched two new products with multi-million pound revenue forecasts
- **Becoco** have implemented a new interface design and secured £350,000 seed funding
- **Future Piano** have completed a successful kickstarter campaign enabling prototype manufacture
- **Entomics** secured further funding to build a large-scale demonstrator of their design and have rolled out their first commercial unit
- **Helix Centre** have begun a clinical trial of their design at Charing Cross Hospital, and have won follow-on funding from the NIHR Biomedical Research Council

Additional case studies can be found on pages 24 and 25.

The unique characteristics of design in innovation

Human-centred design, as the name implies, starts by viewing problems and solutions through the lens of people, rather than technology or engineering. Innovation projects led by technical disciplines are often characterised by the linear development and implementation of a prescribed idea, with an emphasis on solving technical challenges to make it work. In contrast, human-centred design involves activities to understand and reframe the problem from the perspective of the people involved. It can elicit discoveries that inspire better ideas and prompt beneficial changes of direction, before they become prohibitively expensive.

An early-stage design study may begin by exploring problems or opportunities, without any pre-conceived solutions in mind. If there is an idea of the most likely outcome, it might be loosely defined and liable to change. The exploratory nature of early-stage design activity doesn't make it more risky, or less efficient. Rather, it is an excellent way to manage people-related risks, avoid costly late-stage problems and improve results. Great design is still rigorous, and outcome focused, it's just that it encourages discoveries to be made and acted on in a way likely to deliver value for users – rather than taking a “we can't be wrong” approach to implementing a prescribed idea.

Innovation projects progress along different paths at different speeds, and design can often be the catalyst for acceleration or a change of direction. Viable ideas resulting from an early-stage design study may qualify for further R&D funding or investment. Equally, they might be easy to implement with little investment – negating the need for increased financial commitment. In other cases, unexpected discoveries made during a design study could prompt a business to pause and reflect, perhaps rethinking their idea, investment plans or even business model.

If we are to successfully exploit the opportunities set out in this Strategy, our interventions and processes must take account of the unique characteristics and potential impact of design.



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Why is Innovate UK investing in design?

Investing in excellent design is essential to realising our vision for the UK to be amongst the best places in the world for businesses to innovate and grow. This is not a strategy to grow the UK design sector. It is a strategy to help innovative companies across the UK economy grow faster through the better use of design. With businesses better equipped to exploit the value of great design, the benefits of innovation will be greater and more readily achieved.

Our design programme meets the four criteria necessary for all Innovate UK investments, namely:



There is a significant global market opportunity

Investing to stimulate the adoption of best-practice design within UK businesses represents a significant opportunity for economic, societal and environmental value creation. This applies in all parts of the UK economy and in all the global markets UK companies serve. Additionally, encouraging early-stage design activity within the businesses we fund presents an opportunity to de-risk subsequent R&D investments and, by doing so, maximise our return for the UK.



The UK has the capability

The UK is well-placed to exploit that opportunity. With the right approach, we can create an innovation ecosystem powered by a fusion of cutting-edge technology and world-class design. We have already begun to demonstrate that potential through new collaborations between the UK technology and design sectors, with impressive results for business.



The timing is right

The government is committed to increase total R&D investment. We can maximise the impact and return on that investment by helping more businesses integrate design within their R&D activities. But it is important that we act fast, as other countries are also implementing design strategies and investing in design skills.



Innovate UK can add value

Despite our wealth of design talent, relatively few UK businesses exploit that capability and create added value through great design. As a business-led public body, Innovate UK is well placed to help companies understand, access and use design more effectively.

Understanding design in innovation

What do we mean by design?

The word design is often used to describe an output (something's form, layout or appearance), or perhaps a finishing process to improve the way something looks. Design, in the context of innovation, is much more than that. The following distinction can be helpful: if innovation is the process of converting novel ideas into goods or services that create value, then design is an approach or methodology that puts people at the heart of that process, delivering greater value by making sure that the outputs are desirable and fit-for-purpose.

As a professional capability, design can help businesses derive more value from their ideas and reduce the risks associated with developing and commercialising them. It is characterised by a people-centred mindset and an exploratory, iterative approach to defining and solving problems. Businesses can use design to support the development of goods, services, processes, environments and business models.

The design mindset and skillset

Much of design's value lies in the mindset and professional skillset of those who do it well: a combination of critical thinking and applied creativity. The best designers have a restless curiosity to understand the root cause and wider context of the problems they address. Crucially, this is combined with the ability to translate what they learn into actionable plans and tangible outputs.

When entrenched assumptions and siloed knowledge inhibit creativity, a designer can fulfil an important role as a provocateur. By challenging assumptions and reframing questions, they can help teams to reimagine the status



Head Problem solving

The ability to visualise, conceptualise the intangible

Heart Humanity centred

The passion and curiosity to design solutions that are right for people and planet

Hand Practical skills

The technological abilities to enable the end goal to be reached

quo, rather than just making a better version of what already exists. For example, if the immediate challenge appears to be "We need faster trains" a designer's instinct might be to ask "Why do people need to get from A to B faster? Would people accept a slower journey if it was more enjoyable or productive?" Such thinking can open up new avenues for creative thinking and innovation.

Designers put people at the heart of the innovation process, as a source of inspiration and ongoing validation. They use human-centred research to build empathy, and work collaboratively to understand and fix problems,

including with those who are affected – empowering them to bring about positive change in their own lives.

Of course, designers do not have a monopoly on creativity or on the consideration of people, but they are trained and experienced in creative methods and the application of human-centred thinking within a business context. As such, the expertise they contribute can enhance a business's capability in these critical areas – especially in technology-intensive firms.

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Design disciplines and applications

The design profession encompasses a broad spectrum of disciplines including industrial design, product design, UX design, graphic design and many more. There are also comparatively new and emerging fields such as service design, social design and computational design. These disciplines share a common, people-centred mindset and problem solving approach, but differ in the technical knowhow to realise a particular output: a physical or digital product, piece of visual communication, new process etc. Today, many designers and design teams operate across disciplines, combining expertise in multiple fields to deliver rich, cohesive experiences.

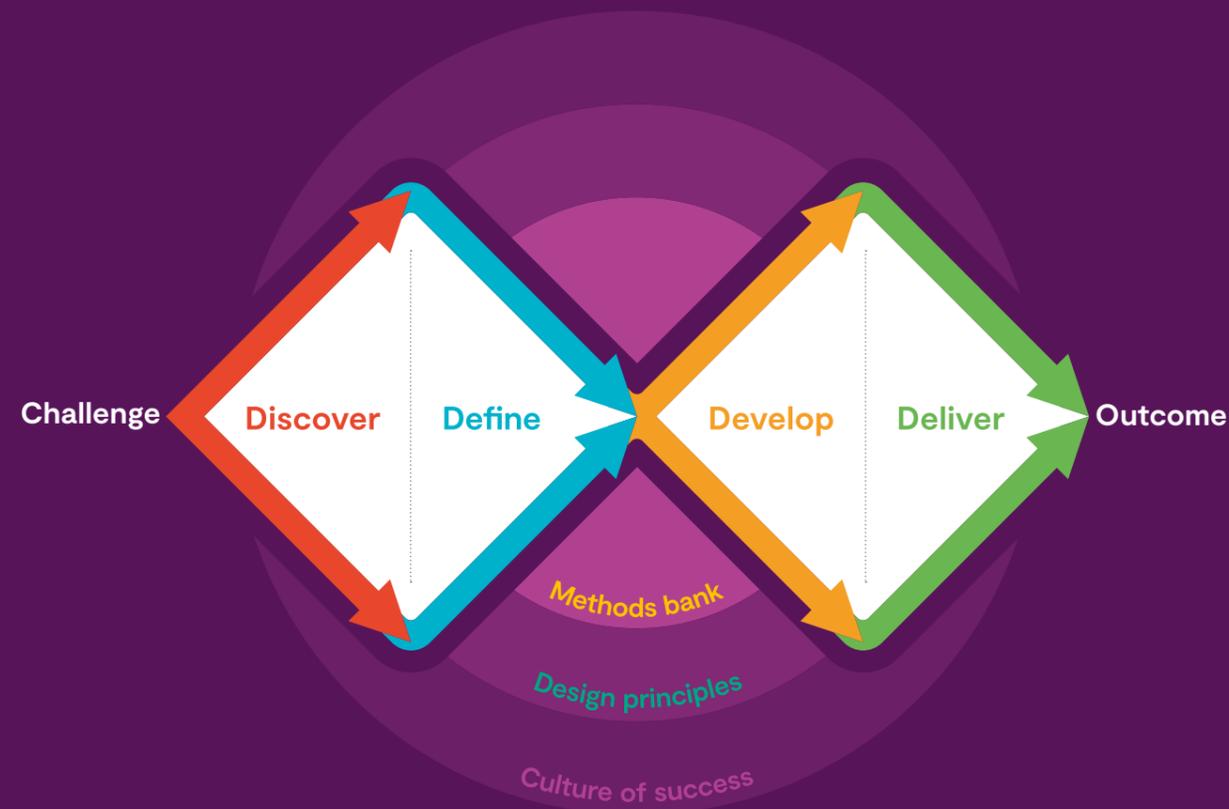
Increasingly, the methods that designers use to understand and respond to complex problems are being applied to challenges in new areas. We have seen the adoption of design principles in policy making¹, public services² and financial services³ for example.

What does design look like in practice?

Designers use a variety of processes and tools to gain contextual understanding, make discoveries and to generate, test and specify ideas. But great design is not defined by a single process any more than engineering is defined by a single equation. Processes and tools are a means to an end and the best designers use their skills, experience and intuition, while adapting their approach to the challenge at hand.

Nevertheless, various frameworks and models have been created in an attempt to capture the common characteristics and typical progression of an effective design process. The Design Council's Framework for Innovation, incorporating the Double-Diamond process, is one such model. It is widely referenced and a good place to start, but there are many variations on the theme. We include the framework here as a way for readers, especially those less familiar with design practice, to understand how a typical, though not definitive, design process works.

A Framework for innovation: the Double-Diamond



Methods bank

These methods help to identify and address challenges and to achieve successful outcomes:

- Explore**
Challenges, needs and opportunities.
- Shape**
Prototypes, insights and visions.
- Build**
Ideas, plans and expertise.

Design principles

The framework outlines four core principles for problem-solvers to work as effectively as possible:

- Put people first**
Start with an understanding of the people using a service, their needs, strengths and aspirations.
- Communicate visually and inclusively**
Help people gain a shared understanding of the problem and ideas.
- Collaborate and co-create**
Work together and get inspired by what others are doing.
- Iterate, iterate, iterate**
Do this to spot errors early, manage risk and build confidence in your ideas.

Creating a culture of success

Many problems require working with other organisations and supporting people to be part of the solution. As important as the process and principles, is the culture of an organisation and how it connects with people and partners.

- Engagement**
Engagement is needed not just internally, but also with partners who might have other ideas. Developing connections and building relationships is as important as creating ideas.
- Leadership**
Leadership is needed to encourage innovation, build skills and capability, and provide permission for experimentation and learning. It should allow projects to be open and agile, sharing results along the way and with the freedom to change.

The two diamonds represent a process for exploring an issue more widely or deeply (divergent thinking) and then taking focused action (convergent thinking).

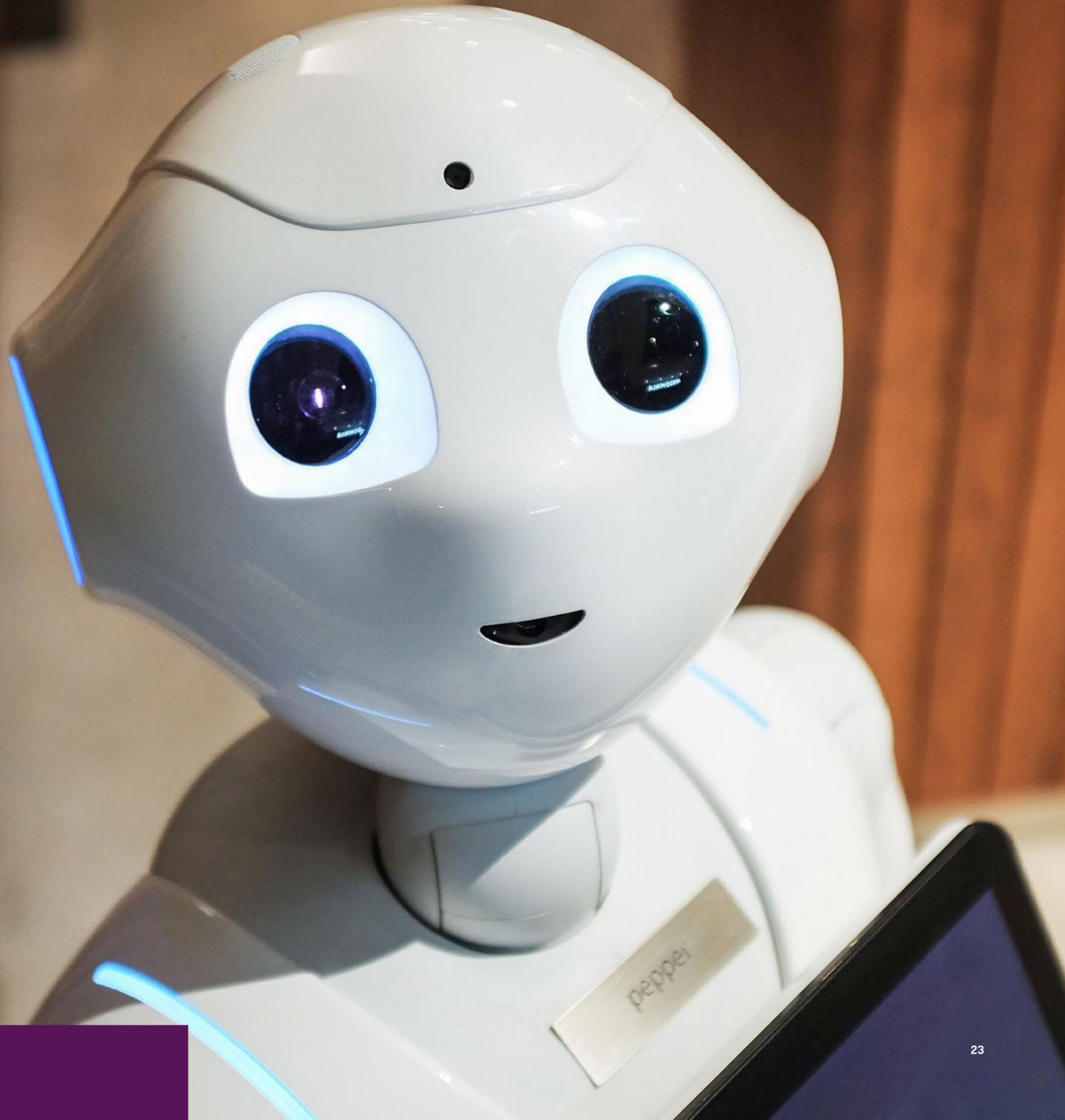
- Discover** ▶ The first diamond helps people understand, rather than simply assume, what the problem is. It involves speaking and spending time with people affected by the issues.
- Define** ▶ The insight gathered from the discovery phase helps to define the challenge in a different way.
- Develop** ▶ The second diamond encourages exploration of different answers to the defined problem, seeking inspiration from elsewhere and co-designing with a range of different people.
- Deliver** ▶ Delivery involves testing out different solutions at small-scale, rejecting those that will not work and improving the ones that will.

An important take-away from the double-diamond model is that fully half of the process is concerned with making contextual discoveries and defining the problem that you're seeking to address. The exploration and refinement of possible solutions only begins in the second half of the process. Great design is not a responsive activity that starts with the delivery of a brief – much of its value is in helping to inform that brief.

Many companies applying to Innovate UK for grant funding do so when their project has already reached the centre point of the double-diamond process shown above. Their proposals are often about overcoming technical challenges to realise a predefined idea. If they have already carried out robust 'discover and define' activities, there should be no issues. But, if they haven't, there is a risk that people-related problems will surface later, when they are expensive and time-consuming to correct.

It should be noted that design, in practice, is rarely as linear as models tend to suggest. Designers might start making prototypes in the first diamond as a way of investigating a problem, while discoveries made when testing ideas in the second diamond might prompt a re-think of the original opportunity. Design, especially in the early stages, can feel 'messy', but this is an inherent characteristic of its exploratory, divergent approach. Experienced design professionals tend to be comfortable with uncertainty at the outset of a project – confident that a rigorous approach will steer them toward the right solution. For businesses new to design, it can sometimes feel challenging and uncomfortable, until familiarity and – all being well – good results serve to build trust.

The benefits of excellent design



Benefits for businesses and the economy

For businesses engaged in innovation, regardless of size or sector, design can be a catalyst for growth. We can easily see the value of great design (and the detrimental effects of bad design) in the goods, services and environments that we buy and use in our daily lives. Given the means, people will pay a premium for a more desirable and frustration-free experience, and many will become loyal customers, recommending it to others. At work, we're likely to perform better if the places, tools and systems we use are designed with better consideration of our needs. The following are all recognised benefits from the effective use of design:

Delivering more valuable outcomes. Great design boosts the value of new ideas by making sure they're not only feasible, but also desirable, useful and frustration-free. It gives businesses a competitive advantage and allows them to compete on value, rather than price, by offering preferable customer experiences that command a premium. At the same time, design can find novel ways to reduce costs without compromising the end result.

Reducing innovation risk. By involving people earlier through user-research, testing and co-design activities, a design approach can help companies make important discoveries and validate ideas sooner. It reduces the risk of late-stage problems, saving time and money and increasing the likelihood of successful outcomes.

Accelerating scale-up. For early-stage technology firms, a people-centred approach can help to secure investment, generate revenue sooner and scale-up faster. Professional design expertise can provide a focus on customer benefits and value propositions, along with the skills to visualise and communicate them to potential investors, partners and customers. Design methods can be used to quickly identify and validate routes to market, commercialisation opportunities and business models.

Improving business performance. When design is an integral part of a company's strategy, it can improve business performance by unlocking the creativity within

teams and encouraging a more collaborative, less risk-averse culture focused on making things better for people. Naturally, this translates into a stronger brand with a clearer business purpose, coherent identity and great customer experiences that encourage loyalty and advocacy.

Long-term studies by McKinsey⁴ and the Design Management Institute (DMI)⁵ have compared the performance of businesses with strong design capability against that of their peers. In both cases, the businesses that exhibited the best understanding and most effective use of design were found to outperform their peers by around 200% in terms of revenue and shareholder returns. Many other studies have linked design capability with increased customer satisfaction, faster growth, increased revenue and exports⁶. Evidence based award schemes such as the Design Business Association's (DBA) Design Effectiveness Awards⁷ routinely highlight examples of design delivering significant value for business.

Design Foundations case studies

Between 2017 and 2019, over 150 UK companies were awarded grants through Innovate UK's Design Foundations competitions, helping them to work with professional designers and carry out early-stage, human-centred design studies

Qumodo

Design for good policing

Since launching in 2016, AI company Qumodo has dedicated itself to using the latest technologies to address social issues, particularly in relation to criminal justice and policing. It has recently developed an image search platform for police investigations that is not only easy and intuitive to use, but also reduces psychological distress for officers working on sensitive cases such as child protection. Human-centred design was an essential part of the approach and, with the help of an Innovate UK grant, Qumodo interviewed a broad range of users in order to create the optimum user experience. They explored and tested alternative solutions before producing a compelling, video-based demo of their proposition.

The company has since won a £1.3m contract with the Home Office to deliver software helping police officers in the fight against online child sexual abuse and exploitation.

According to Chief Executive Ben Gancz, a human-centred design approach has been critical to Qumodo's success: "Our business has flourished as a result of integrating design from the outset. We're planning to make four new hires over the next year, including two full-time designers. I really see us being a design-led business."

LettUs Grow

Designing the future of farming

Based in Bristol, LettUs Grow are developing aeroponic farming technology and management software to boost crop yields and reduce the environmental impact of agriculture. Innovate UK funding enabled them to work with Crux Product Design to explore alternative propositions and routes to market. They engaged with potential customers to understand their needs, and to design an optimised product and service offering.

This design project shaped LettUs Grow's business case and investment pitch, leading to a successful £400,000 grant through the Industrial Strategy Challenge Fund as well as £460,000 pre-seed and £2.35m seed funding. They have expanded their business from three to twenty-one full-time employees.

According to Co-founder Jack Farmer: "We've learnt so much more about how we engage with customers, and that's dramatically changed the way we work and the solutions we developed. The grant helped us explore and figure out exactly what was needed, rather than rushing to launch something to market and then chasing down problems later. We gained confidence in the opportunity, our solution and our route to market."

Also Known As

Design for hostile environments

In 2011, filmmaker Olivier Sarbil was critically injured by an RPG whilst documenting the war in Libya. His partner, journalist Kate Parkinson, was close by, but the hostile environment training she'd received proved inadequate for the realities of the situation, and she froze.

Olivier recovered, but Kate was convinced there were better ways to train journalists and other workers for the realities of conflict. Together with her Also Known As co-founder Aela Callen, she set out to explore whether immersive technologies could support more engaging and effective hostile environment training.

With a Design Foundations grant from Innovate UK, and drawing on Aela's expertise from Stanford d.school, they conducted interviews and workshops with users and stakeholders, prototyped ideas, and tested and iterated throughout.

The project has attracted interest from major news organisations, and Also Known As has since been awarded an Innovate UK Smart grant to develop their idea further. Kate is clear that the Design Foundations grant has transformed their business: "We've been able to really understand the needs of our users and to start co-designing our products with them, this project really has been game-changing for us."

Immaterial

Design for new materials

Immaterial develops metal-organic frameworks – a class of super-adsorbent materials with applications ranging from hydrogen fuel cells to cancer treatment and air purification. The company needed help to identify and validate commercial opportunities, and to plot a strategy for scale-up. An Innovate UK Design Foundations grant gave them the opportunity to do just that.

Initially, this might not seem like a design challenge – but Immaterial, working with Rapid Innovation Group, specialists in the commercialisation of high-impact technologies, used design methods to engage stakeholders across a range of sectors to identify market needs, create specific propositions in response to these, and to communicate the value of those propositions to investors, partners and customers.

For COO Ben Swan it was a revelatory process: "We discovered far more than we expected. We thought we had a clear idea of our proposition and market, but with hindsight, we didn't have a clue. It's very easy as a technology developer to have tunnel vision on what you're making; you assume because you know how it works, you also know how it's valuable."

Over the last two years, Immaterial credit their design project as helping them win a £2 million collaborative R&D grant to construct a pilot manufacturing plant, secure significant angel investment, win places on UK accelerators in automotive (TDAP), and Oil & Gas (TechX), and establish corporate collaboration agreements in a broad range of adjacent sectors including defence and green chemicals.

Benefits for society and the environment

Design has a vital role to play in shaping innovative solutions to the big challenges facing our society and the world we live in. From helping us to stay healthy and happy for longer, to preserving and protecting our planet and resources⁸.

Design's empathic, people-centred approach is well suited to tackling knotty problems that might combine social, cultural, political, economic and environmental factors. The broader applications and benefits of design have been demonstrated through our own programmes including design-focused competitions to support a circular economy and to address the UN sustainable development goals, as well as ISCF challenges such as Healthy Ageing, which recognises inclusive design as being crucial for successful outcomes.

People are far more likely to adopt and stick with new ideas when they are brilliantly designed and take account of people's motivations and behaviours.

Internationally, the What Design Can Do (WDCD) annual conferences and global design challenges have explored the use of design to address themes including Climate Action, Child Sexual Exploitation and Refugee Crises⁹. Similar, and more, applications of design have been highlighted by Dezeen's Good Design for a Bad World series of articles and talks¹⁰.

We can also see the societal and environmental benefits of great design in individual projects. Amongst those supported by Innovate UK have been:

- Guidelines for the design of prisons to improve the health and wellbeing of inmates
- A digital platform offering peer-to-peer support for teenagers with mental health concerns
- Sustainable clothing that grows with your child, reducing waste
- Shared, immersive experiences that tackle isolation and loneliness in later life

The outbreak of the Covid-19 virus also provided numerous examples, with designers leading on new medical devices and health worker clothing, creating information campaigns to help prevent the spread of the illness, and also working with medical professionals on the design of healthcare facilities.

People are far more likely to adopt and stick with new ideas when they are brilliantly designed and take account of people's motivations and behaviours. This is an essential consideration when large-scale adoption and/or changes in behaviour are necessary to achieve the desired result – for example, meeting targets for lower CO₂ emissions or reducing hospital admissions. Great design means that people can make better purchasing and behavioural choices based on what they love, rather than relying on a sense of moral duty or social conscience.

The UK's design capability

The UK has a world-class design sector. Altogether, according to the Design Council, the UK's design economy is made up of 1.7 million designers and contributes £85 billion GVA¹¹. It ranks sixth in the world for design exports¹² and is home to some of the world's most successful design-led organisations and iconic creative brands, including Unilever, Dyson, British Airways, Jaguar Land Rover, Barclays, Diageo and the BBC. Alongside these in-house design teams are many high-performing design consultancies covering established and emerging design disciplines¹³. British designers such as Thomas Heatherwick and Jonathan Ive have become international stars, whilst global brands such as Samsung, Geely Auto and Logitech have chosen to take advantage of our talent and located design centres in the UK.

The industry is underpinned by renowned art and design education institutions, many of which run multidisciplinary courses and long-established programmes linking business and design. Of the top ten design schools in the world, according to the QS university rankings benchmark, three are in the UK: Royal College of Art, University of the Arts London and Glasgow School of Art¹⁴. Across the country, universities and art colleges are working with industry to pioneer new design frontiers – leading the way in bringing design disciplines into emerging sectors, such as fintech, robotics and autonomous vehicles.



Opportunities and challenges for business

Boosting performance through design

There is a significant opportunity to boost business performance and economic growth by helping UK companies to better exploit the value of design. We know that some companies create more value through design than others, and that this depends on the way that design is used and managed within their business. In particular, studies have found that design creates least value if used only on an ad-hoc basis within projects, for example as final finish, more value when recognised as a business function and embedded within routine processes and most value of all when it is integral to the business strategy and forms part of the cultural DNA of the organisation¹⁵.

Based on this insight, researchers have proposed various staircase models with higher levels representing more effective design practices. Companies can use these models to plot their current position and, from there, understand what they could do differently to create more value from design. To understand the opportunities for UK businesses to boost their performance through design, we have used a model adapted from the Danish Design Ladder and the DME Design Management Staircase. It identifies the four levels illustrated opposite.

The higher a company's level, the greater the strategic importance of design within that company and the more likely it is that design will contribute to value creation and growth.

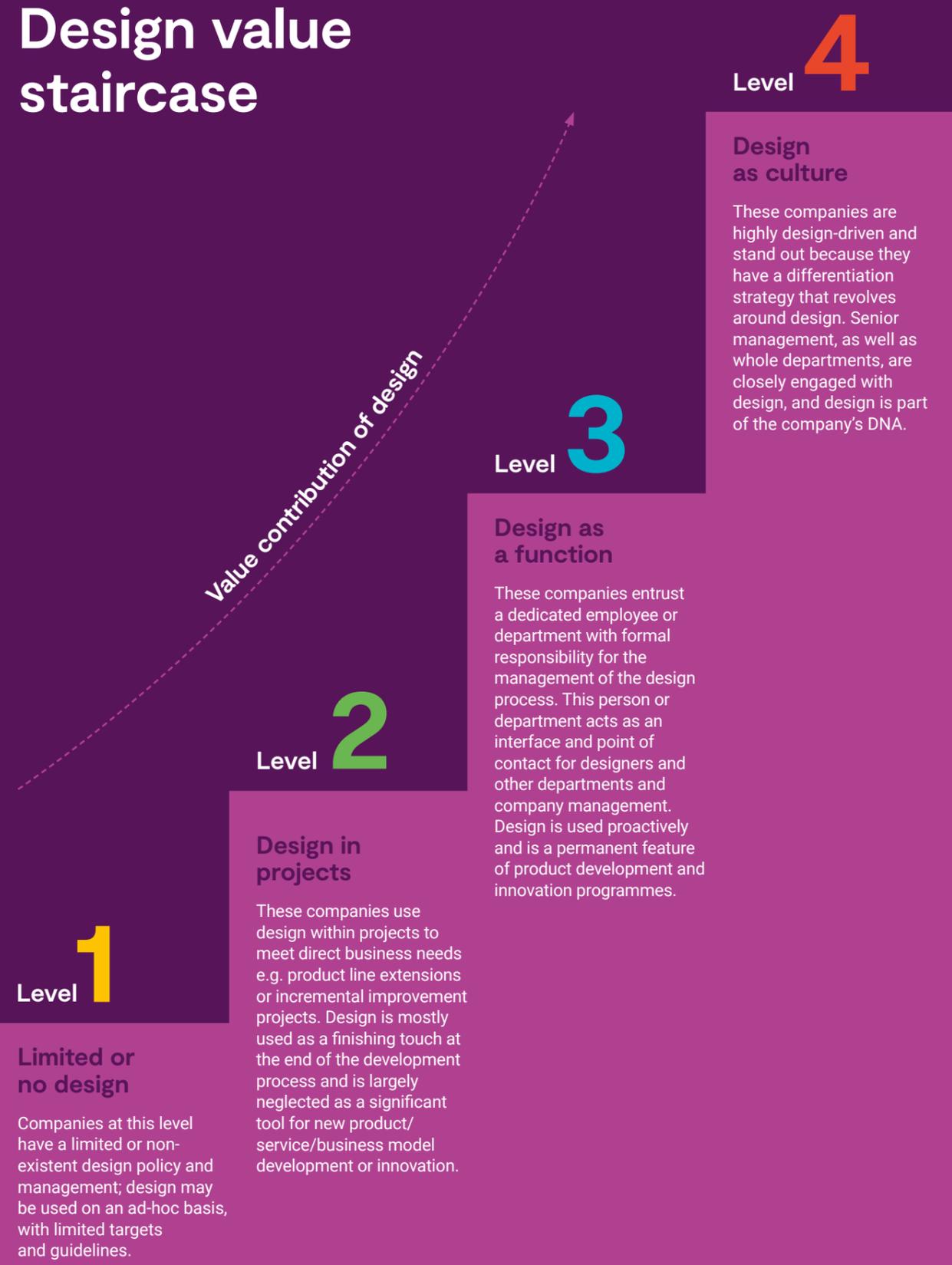
In 2017, the Design Council carried out a survey of 1000 UK firms using a similar four-level model. They found that 40% were at the lowest level (no design) and a further 26% were only at level 2 (using design only as a final finish within projects)¹⁶. They also noted that only a quarter of firms employed staff whose role it was to undertake design functions.

These results are consistent with other nations: In 2018, InVision found that organisations across 77 countries were fairly evenly distributed in terms of their use of design, with large percentages of companies on the lower end of the value scale¹⁷. Nevertheless, there is clearly a significant opportunity for UK businesses to use design more effectively – moving up the value 'staircase'. If they did so, we would expect to see greater economic, societal and environmental impact resulting from their innovation activities. The more effective conversion of ideas into successful commercial propositions would also yield higher returns on innovation investment.

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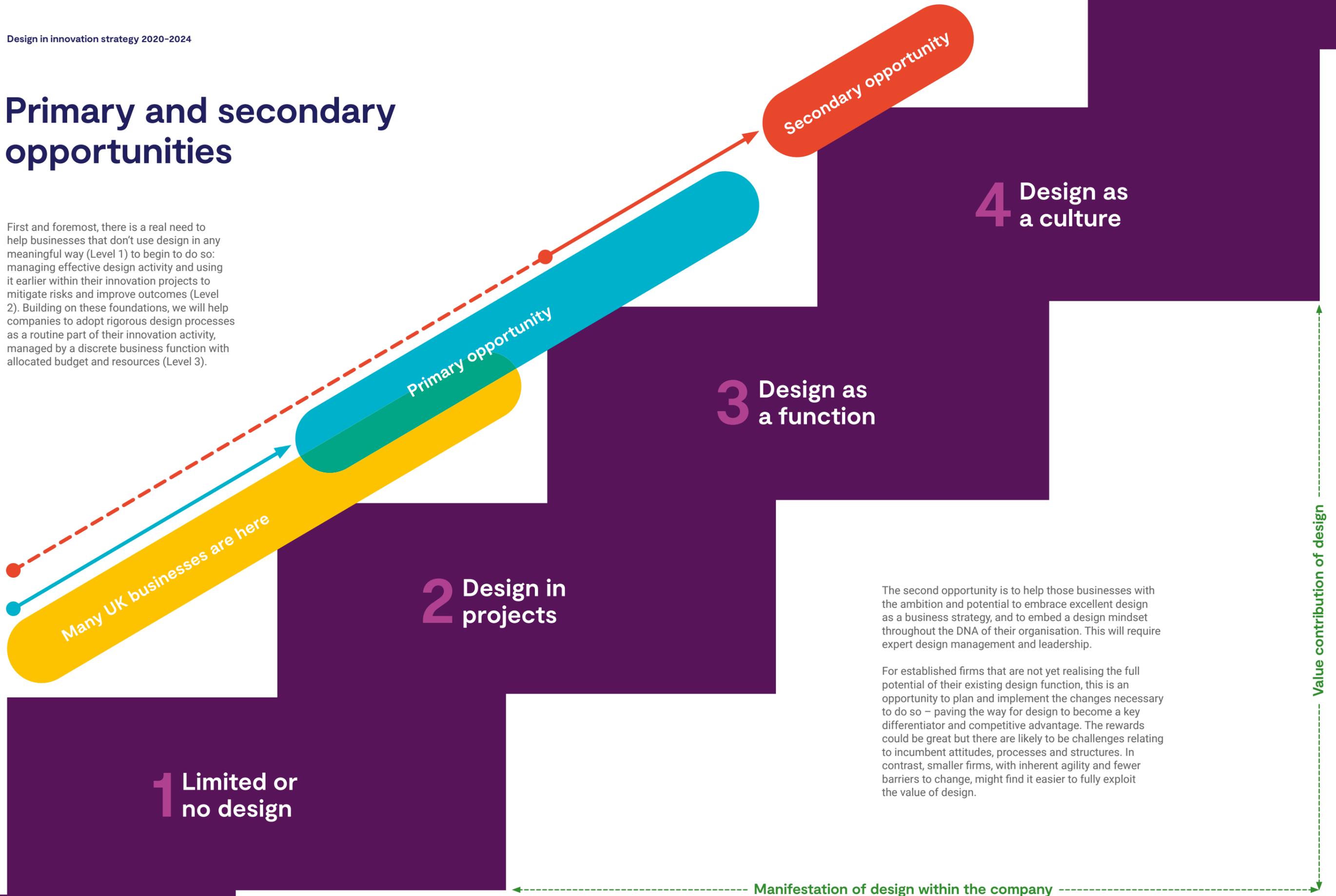


Design value staircase



Primary and secondary opportunities

First and foremost, there is a real need to help businesses that don't use design in any meaningful way (Level 1) to begin to do so: managing effective design activity and using it earlier within their innovation projects to mitigate risks and improve outcomes (Level 2). Building on these foundations, we will help companies to adopt rigorous design processes as a routine part of their innovation activity, managed by a discrete business function with allocated budget and resources (Level 3).



1 Limited or no design

2 Design in projects

3 Design as a function

4 Design as a culture

Many UK businesses are here

Primary opportunity

Secondary opportunity

The second opportunity is to help those businesses with the ambition and potential to embrace excellent design as a business strategy, and to embed a design mindset throughout the DNA of their organisation. This will require expert design management and leadership.

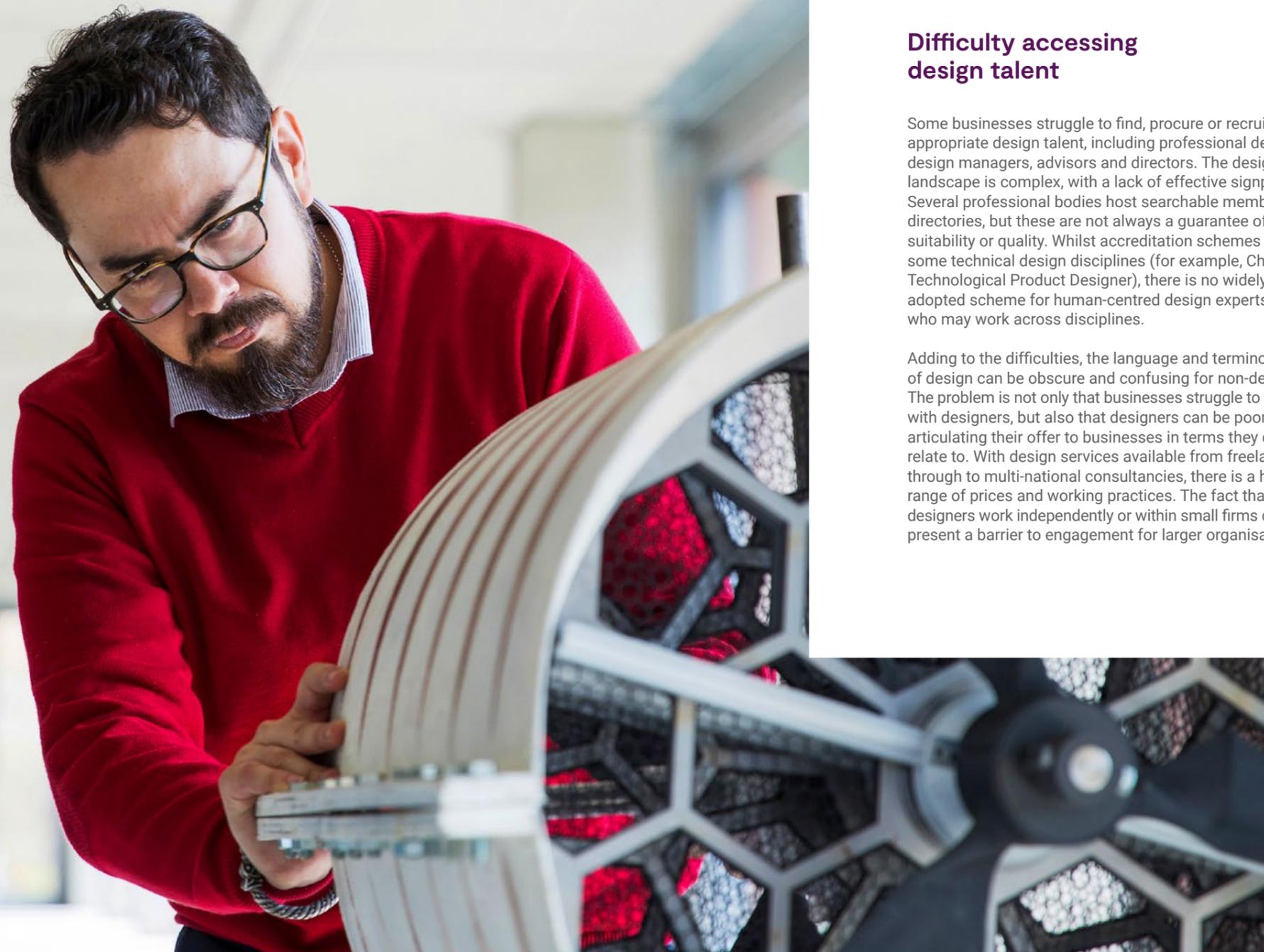
For established firms that are not yet realising the full potential of their existing design function, this is an opportunity to plan and implement the changes necessary to do so – paving the way for design to become a key differentiator and competitive advantage. The rewards could be great but there are likely to be challenges relating to incumbent attitudes, processes and structures. In contrast, smaller firms, with inherent agility and fewer barriers to change, might find it easier to fully exploit the value of design.

Manifestation of design within the company

Value contribution of design

Challenges

In order to exploit these opportunities, there needs to be a clearer understanding of the barriers that currently prevent businesses from realising the full value of design. Through consultation across industry and academia, and discussion with businesses across the Innovate UK portfolio, we've identified four barriers that restrict the uptake of design by businesses, and the value they're able to realise from it.



Insufficient investment in design

Some businesses choose not to invest the time and money necessary to manage and carry-out effective design activity. They might not recognise the relevance of or need for design, be wary of the potential disruption, lack the funds needed to procure, manage or carry out high-quality design activity, or else be unconvinced by its potential value.

It has been said that design is an investment, not a cost. Even so, for smaller businesses under pressure to deliver fast results, diverting resources away from immediate priorities and toward exploratory activities with uncertain outcomes – no matter their likely downstream value – is a big ask.

Difficulty accessing design talent

Some businesses struggle to find, procure or recruit appropriate design talent, including professional designers, design managers, advisors and directors. The design landscape is complex, with a lack of effective signposting. Several professional bodies host searchable membership directories, but these are not always a guarantee of suitability or quality. Whilst accreditation schemes exist for some technical design disciplines (for example, Chartered Technological Product Designer), there is no widely adopted scheme for human-centred design experts who may work across disciplines.

Adding to the difficulties, the language and terminology of design can be obscure and confusing for non-designers. The problem is not only that businesses struggle to connect with designers, but also that designers can be poor at articulating their offer to businesses in terms they can relate to. With design services available from freelancers through to multi-national consultancies, there is a huge range of prices and working practices. The fact that many designers work independently or within small firms can also present a barrier to engagement for larger organisations.

Poor management of design processes

Design has more impact and value when it is embedded and managed as a routine process. That is more readily achieved when responsibility for design management resides within a dedicated business function with appropriate resources, skills and experience.

Some businesses – especially those with less experience of design – lack the management expertise necessary for effective planning, implementation and evaluation of design processes. They're unlikely to recognise design as a discrete business function so, even if some staff have relevant skills, their operational ability might be compromised.

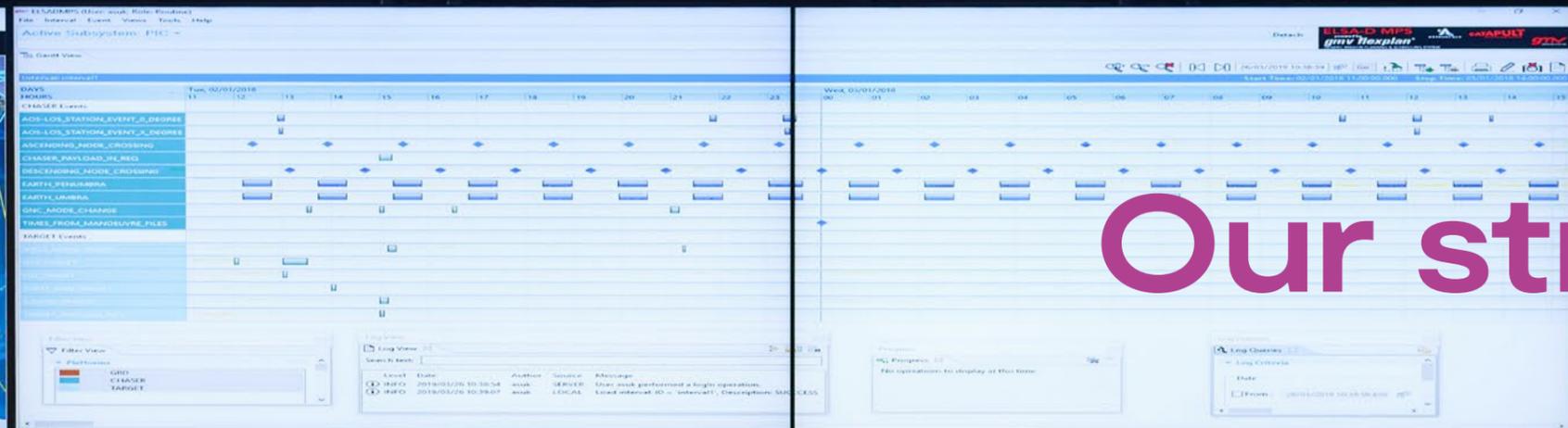
Particular challenges include managing the interface between design and other business functions to promote collaboration and avoid conflict. Whilst designers tend to be comfortable with the inherent uncertainty of early-stage 'discovery' activities, it can be a concern for teams used to more tightly constrained R&D activities. Managing the interdependence of design activities and outputs with other R&D processes also requires a degree of expertise and experience that may be lacking.

Lack of strategic design leadership

The greatest returns on innovation investment are realised by companies that embrace design as a strategy for differentiation and growth. Through effective design leadership, they cultivate a people-centred mindset across the organisation, so that delivering better customer experiences becomes second-nature.

The rewards for achieving this are significant but if a business has not been founded on design principles from the start, then adopting and upholding them retrospectively can be difficult – especially for larger or more established companies. Design can only thrive, and deliver impact, in the right conditions. Businesses seeking to adopt a more strategic use of design may need to consider changes to organisational structure, management culture and roles and responsibilities – empowering staff to challenge existing thinking and to explore new ideas. This might in turn require different performance metrics and a greater acceptance of risk and potential failure.

Our strategy



Name	Description	Sequencer	Domain	Release Time	Execution Time	S	D	C	G	B	E	ST	Source	FC	IC	R	Q	A	SS	1122	CC
S2KTC005	TC(3.1)		GEN	2019-085112:11:51.906	2019-085112:13:52.142	E	E	E					NSOCISSA	01	03	S	S	S	S	S	S
S2KTC502	SetV(R) Control Command		GEN	2019-085112:09:21.625	2019-085112:09:21.627	O	O	E					NSOCISSA	-	-	S	S	S			
S2KTC001	OPEN SESSION		GEN	2019-085112:05:31.594		O	O	E					NSOCISSA	00	00	S	S	S			
S2KTC005	TC(3.1)		GEN	2019-073114:14:43.1		E	E	E					NSOCISSA	09	01	S	S	S	S	S	S
S2KTC005	TC(3.1)		GEN	2019-072112:30:14		E	E	E					NSOCISSA	01	01	S	S	S	S	S	S
S2KTC005	TC(3.1)		GEN	2019-072111:43:29		E	E	E					NSOCISSA	08	01	S	S	S	S	S	S
S2KTC005	TC(3.1)		GEN	2019-072111:42:02		E	E	E					NSOCISSA	07	01	S	S	S	S	S	S
S2KTC005	TC(3.1)		GEN	2019-072110:53:46		E	E	E					NSOCISSA	06	01	S	S	S	S	S	S
S2KTC005	TC(3.1)		GEN	2019-072110:35:32.9		E	E	E					NSOCISSA	05	01	S	S	S	S	S	S
S2KTC005	TC(3.1)		GEN	2019-072110:18:21		E	E	E					NSOCISSA	04	01	S	S	S	S	S	S
S2KTC005	TC(3.1)		GEN	2019-072110:16:11		E	E	E					NSOCISSA	03	01	S	S	S	S	S	S
S2KTC005	TC(3.1)		GEN	2019-072110:15:34.4		E	E	E					NSOCISSA	02	01	S	S	S	S	S	S
S2KTC005	TC(3.1)		GEN	2019-072110:13:11.6		E	E	E					NSOCISSA	01	01	S	S	S	S	S	S
S2KTC005	TC(3.1)		GEN	2019-072110:10:05.2		E	E	E					NSOCISSA	01	03	S	S	S	S	S	S

Our strategic themes

To help unlock the full value of design, Innovate UK will structure activities and interventions around four strategic themes, in line with the opportunities and challenges outlined in the previous pages.

Making the case for investment in design

It is vital to help companies recognise and quantify the value of design in relation to their own business and innovation challenges. We will frame design in the context and language of business and innovation, and work with industry partners, business organisations and peer networks to amplify our message. We will act as a catalyst for change at scale by:

- making use of the communication channels available to us to raise awareness and understanding of design and to reach a wider audience with compelling and practical content
- championing great design – including support for business-facing award schemes and showcasing events
- targeting harder-to-reach audiences including less design-aware businesses, using relevant language and persuasive messaging
- amplifying the design message internally, through a network of design advocates, and externally through business-facing organisations and networks, such as the KTN

Reducing the cost of entry for those new to design

We will share the cost and risks of investing in design by providing grant funding as well as exploring other finance products (such as innovation loans or investment accelerators) which can help to stimulate investment in design. We will increase the support available for design activities across the Innovate UK portfolio, by:

- running dedicated funding competitions, such as Design Foundations, which are specifically intended to enable innovative businesses to work with professional designers
- encouraging excellent design within the scope of Innovate UK's broader R&D funding programmes, such as Smart and the Industrial Strategy Challenge Fund, so that design, and designers, become increasingly integral to R&D projects
- piloting bespoke design support interventions aligned with large-scale R&D funding competitions – as a front-end activity and/or in parallel – to ensure that major R&D projects have benefited from human-centred design expertise

Helping businesses access the best design talent

Working with others, we will support initiatives making it easier for businesses to navigate the professional design landscape, and help businesses to become better at procuring or recruiting design. This will involve:

- supporting networking, cohort building and brokerage initiatives to catalyse new and fruitful collaborations between technology innovators and designers
- working with research councils, regional partners and physical hubs such as the Catapult Centres to connect high-value technology clusters with design expertise in order to accelerate commercialisation and boost value creation
- making sure that our programmes help to inform the work of public agencies and educational institutions so that design skills provision remains up-to-date and relevant for industry

Helping businesses maximise the value contribution of design

We will help businesses to create more value through design, focussing on the primary and secondary opportunities discussed above. Firstly, by helping businesses use design within innovation projects to mitigate risks and improve outcomes, and then to adopt routine design processes managed by a specific design function. Secondly, we will help those businesses with the ambition and potential to embrace excellent design as a business strategy, and to foster a design culture across their organisation.

Alongside funding opportunities, which will enable companies to learn through direct experience of projects involving professional designers, we will also:

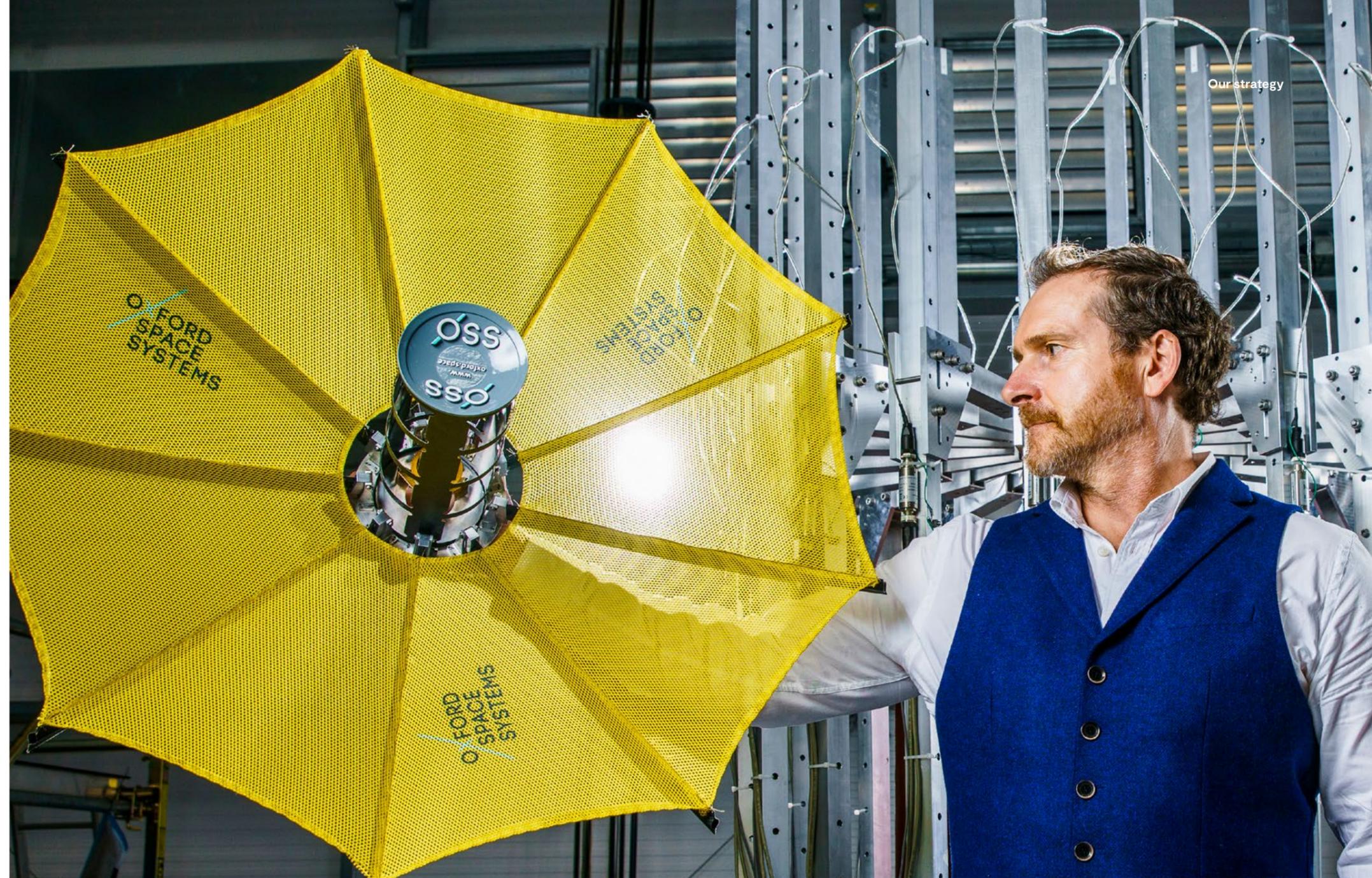
- pilot non-financial support mechanisms to provide businesses with expert design advice and leadership and, through coaching, to boost their understanding and capability relating to design and design management. These mechanisms might include knowledge exchange programmes, clinics, expert mentoring or coaching programmes. We will work with partners such as the Enterprise Europe Network (EEN) and/or design skills providers to deliver these activities
- nurture active communities and cohorts of businesses interested in or using design, to promote peer-to-peer learning and motivation
- encourage, where appropriate, the development and promotion of relevant professional standards for design, such as those within the BSI 7000 series: Design Management Systems¹⁸.

Our approach

Principles for success

As we deliver this Strategy, we will ensure the effectiveness of our interventions by adhering to the following principles

- **Working collaboratively with partners to amplify our message and impact.**
We will collaborate across UKRI and government as well as with networking and business support partners including the KTN and EEN. To reach business communities we will engage with bodies such as the Confederation of British Industry (CBI) and Institute of Directors (IoD). We will continue to maintain close relationships with design bodies, associations and institutions including the Design Council, Design Museum, V&A, Design Business Association, RSA, design schools and others.
- **Being people-centred in the design and delivery of our own interventions.**
This means using the mechanisms available to us to understand and respond to the needs of our business customers and other stakeholders, exploring and testing new approaches, responding to new discoveries and iteratively improving.
- **Recognising the characteristics of design in our scoping and investment decisions.**
Design activity can begin without a clear idea of the eventual solution, so we will focus instead on other aspects including whether or not the opportunity space is likely to be worth exploring, and the project team's motivation, capabilities and approach. Because a design study might reveal significant new insights, we will be responsive to resulting changes in project scope or direction. We will consider the alignment and integration of design support with other R&D support mechanisms recognising that, whilst design has the greatest impact when used early, it maintains a valuable role as ideas progress towards commercialisation.
- **Acting on evidence and expert guidance.**
We will evaluate the impact and effectiveness of our own activities to support continuous improvement, and work with trusted partners to create and compile other data sources and evidence that might inform our plans. We will establish an expert panel from across industry and academia to provide an independent, critical perspective and offer advice and guidance to help shape our programmes.



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Measuring success

At Innovate UK, there is a strong culture of performance management and evaluation, ensuring that our investments represent value for money and deliver maximum benefit to the UK economy and society. This is very much the case for our design programme, and our Strategy is directly informed by the evidence and insights from our monitoring and evaluation work. The benefits of investing in design will often be diffuse, long-term and intangible, but they are no less important for that, and we will use different methods to capture and assess the impacts of our interventions:

- The use of consistent Innovate UK processes and logic models to evaluate the impact of our interventions. We will ensure that all of our investments are managed and monitored, in line with Innovate UK best practice, with industry professionals helping to assess and monitor grant programmes. This will be complemented by evaluation studies to capture economic impacts of investment.
- Piloting the use of design effectiveness models (e.g. the design staircase) and bespoke tools to track changes within the companies we support, and any sectors/clusters that we target, including less tangible attributes like attitude and culture.

Acknowledgments

We would like to thank the many people who have helped us in creating this Strategy, through our industry workshops, interviews, suggestions and by providing feedback on the implementation of our first Strategy.

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UK**

Innovate UK drives productivity and economic growth by supporting businesses to develop and realise the potential of new ideas.

We connect businesses to the partners, customers and investors that can help them turn ideas into commercially successful products and services and business growth.

We fund business and research collaborations to accelerate innovation and drive business investment into R&D. Our support is available to businesses across all economic sectors, value chains and UK regions.

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