

Innovate UK

Design in innovation
Strategy 2015-2019





Executive summary

The term ‘design’ is often used to describe what something looks like or how its component parts are arranged. In fact, design, in the context of innovation, is much more than that.

The context of this strategy

Excellent design is a vital ingredient of successful innovation. It generates value by creating propositions that are desirable, useable and feasible.

The commercial success of any new product, service or process ultimately depends on human motivations and behaviour. While technology can enable innovation, excellent design is the key ingredient that aligns technology (supply) with customers’ needs and desires (markets).

Design in innovation is about more than styling. It is a methodology that can be applied in the creation of better products, services, processes and business models. It can provide contextual insight and help to define innovation opportunities and strategies. Design can help businesses to develop and communicate ideas, and provide them with the means to deliver better solutions to market.

Design has greatest impact when it’s embedded from the earliest stages of, and throughout, the innovation journey¹. This enables an effective progression from contextual understanding towards appropriate solutions that offer outstanding customer experiences and generate more value for business.



Opportunities for business

The UK is a centre for design excellence. The design-intensive industries contribute 7.2% of the UK's total Gross Value Added (GVA) and employ 1.6 million people. We have more than 72,000 design industry businesses employing around 580,000 people. More than 1 million people are employed in design roles across other sectors.²

The value of design to business is clear. For every £1 invested in design, businesses might achieve as much as £20 in increased revenues, a £4 increase in net operating profit and a return of £5 in increased exports.³

Despite this, 68% of UK businesses never, or rarely, use design, or use it only as a 'last finish'.⁴ Since the impact of design is higher when it is culturally embedded⁵, supporting the more effective use of design within these businesses represents a significant opportunity to improve their performance and, therefore, to accelerate UK economic growth.

Challenges

We have identified four challenge areas that must be addressed if more UK businesses are to exploit the value potential of design in innovation:

- **awareness** – some businesses lack awareness of the role and value of design in innovation
- **capability** – some businesses lack the capability to procure or use design effectively
- **culture** – the adoption of design methodologies within an organisation might require culture change, which can be difficult to manage
- **collaboration** – businesses need support to help them develop effective collaborations with the UK's design communities

Our strategy

By addressing these challenges, we can accelerate economic growth through the wider take-up of impactful design across industry sectors and challenge areas.

Our aim is for UK businesses to innovate better, grow faster and achieve greater commercial success through the effective use of excellent early-stage design. Stronger business performance will benefit the UK economy as a whole.

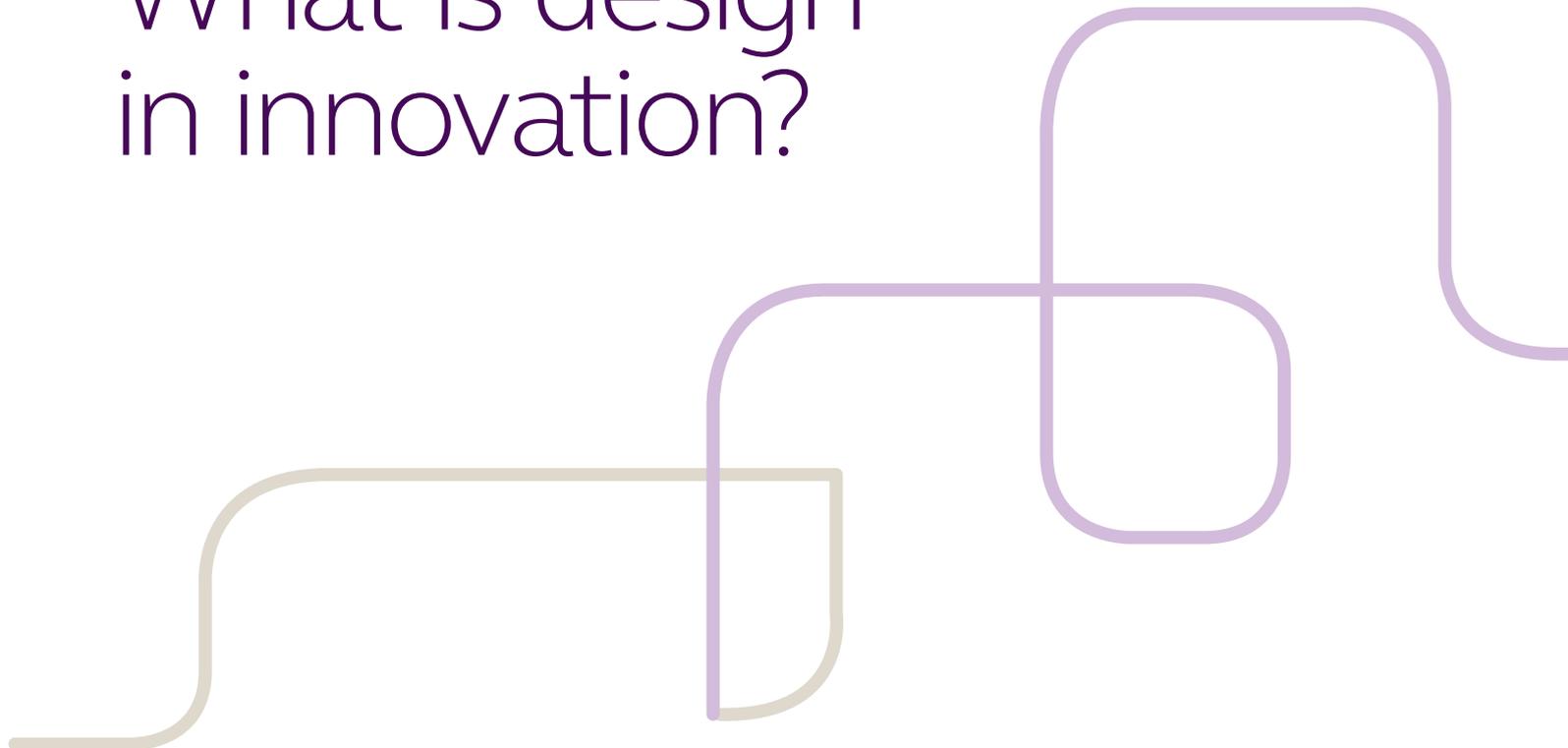
We will:

1. Advocate the use of excellent early-stage design and raise awareness of the value of design in innovation.
2. Bring together design and technology communities, both nationally and locally.
3. Fund high-quality, early-stage 'design foundations' activity in our priority areas to inspire better ideas for subsequent development.
4. Invest in design across our portfolio as an allowable cost within collaborative funded projects.
5. Support knowledge sharing and capability building in design, including through Knowledge Transfer Partnerships (KTPs) and secondments.



Holistic design =
delightful customer
experiences

What is design in innovation?



The term 'design' is often used to describe a tangible output – something's form, layout or appearance – or to refer to a styling activity. In fact, design, in the context of innovation, is much more than that.

This strategy focuses on design as a methodology that can be applied to the creation of better products (physical and digital), services, processes and business models.

While all design is innately creative, designers work in different mediums and employ a variety of tools and processes in the development and delivery of propositions. For example:

- the **proposition** may include one or more elements that are visible (physical devices, digital applications, graphics, environments) or invisible (services, policies or processes)
- the **medium** may take various forms – a physical sketch or model, a spatial plan, digital software or a temporal process or sequence

- design **tools** range from pen and paper through to physical modelling tools and specialist design software, and may be used in both creative and reflective/analytic modes
- design **processes** include various means of insight gathering, creative inspiration and design review, working alone or in collaboration with others

At Innovate UK, we see the greatest value potential in design that balances human, social, environmental, technical and commercial factors. This balance can be achieved through the use of professionally trained designers, multi-skilled teams, and effective and collaborative design processes.

A holistic design process that addresses all attributes of a product or service – be they visual, physical or virtual – can result in delightful and desirable customer experiences.

Design might, at first, appear most relevant to businesses operating in B2C markets, where consumers' purchasing decisions are clearly influenced by emotion, aspiration and cultural associations as much as by rational reasoning.

However, businesses operating within B2B markets and supply chains can also benefit from investment in high-quality design.⁹ Improving the take-up of better design in these markets represents a significant opportunity for accelerated economic growth.

Though the requirements, capabilities and challenges may differ, design can be used effectively at all levels – from start-ups and small to medium-sized businesses through to large, well-established organisations. Design may be managed and practised by in-house resources or procured from external agencies or consultants.

Within certain fields, the term 'design' can also be used to describe the plan for conducting a set of experiments (experimental design), the structure of a desired chemical (molecular design), or other activities where the creative process is solely focused on technical performance and unconcerned with human factors. These activities are more widely understood and used by technology innovators in businesses and so are outside of the scope of this strategy.

Why use design in innovation?

It is a truism that people don't buy technology; they buy what technology does for them. The success of any innovation, therefore, depends ultimately on human motivations and behaviour.

This reality can represent a risk for organisations seeking to exploit innovative technologies, as even the most cutting-edge technology will fail if potential customers see no benefit or are unable to use it effectively. By taking its inspiration from human behaviour, design not only mitigates that risk but leverages opportunities to create more value through outstanding customer experiences.

Great customer experiences are:

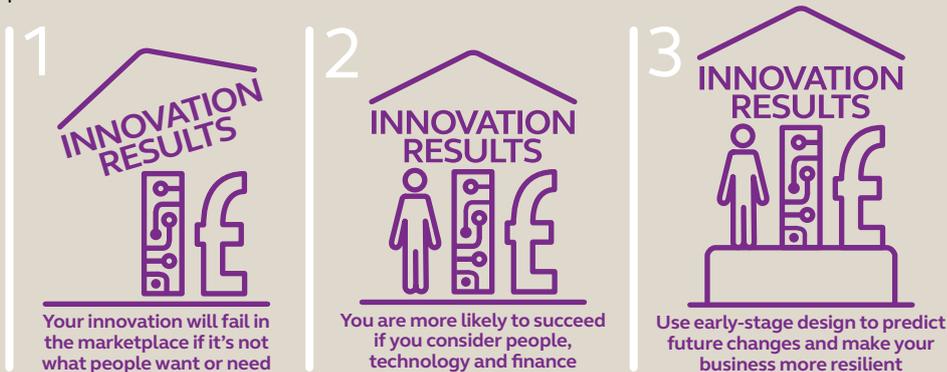
- **desirable** – appealing to customer aspirations
- **useful** – offering a tangible benefit
- **easy to adopt** – accounting for existing behaviour patterns
- **easy to use** – so that benefits can be readily exploited

- **contextual** – relevant and appropriate to real-world scenarios
- **credible** – aligning with, or exceeding, customer expectations

While technology can play an essential role in enabling innovative solutions, excellent design increases the likelihood that those solutions will succeed in the marketplace. In this way, design can become a means to balance technology supply with market demand.

Design can also prompt early consideration of the social and environmental factors likely to influence future markets. This can help businesses to plan more sustainable solutions and become more resilient to future change. The role of design in the creation of better products, services, processes and business models can include:

- the **discovery** of contextual (human, technological and business) insight through the exploration of current and future scenarios and experiences
- the **definition** of innovation opportunities, appropriate strategies and project targets via the synthesis of contextual insight
- the **development** and communication of multiple propositions or ideas in response to specific opportunities
- the **delivery** of solutions via iterative prototyping, testing and refinement cycles, and culminating in accurate specifications and implementation support.



Case studies



BT Home Hub 5

Design creates value for customers and business

BT Home Hub 5 is the device BT uses to connect customers to its fibre optic network. The company used a holistic design approach to choreograph the customer experience across hardware, software and service.

Following a customer experience audit, BT worked with design agency Alloy to identify opportunities for improvement as well as the chance to reduce costs and CO₂ emissions.

At the top of the list was the need to redesign the device so that it would fit through letterboxes. This insight informed the slim form factor with spring-loaded feet. The letterbox size has reduced packaging and distribution costs significantly and eliminated the frustration of missed deliveries.

An integrated VDSL modem allows a straightforward web-based set-up and means that 30% of customers no longer need an engineer to install the device. CDs and instruction leaflets are also no longer needed, further reducing costs and CO₂ emissions.

The cleverly designed packaging by Pentagram Design and a.m. associates guides customers through the set-up process, making it easier and quicker to install.

Through the effective design of its Home Hub 5, BT expects to save millions of pounds in reduced costs and an estimated 13,000 tonnes of CO₂ emissions per year, as well as saving BT customers millions of pounds in reduced energy costs every year.

www.effectivedesign.org.uk/winners/2015/industrial-design/bt-home-hub-5



Metrolink, Transport for Greater Manchester

Service design drives commercial results

In 2009, Transport for Greater Manchester (TfGM) began a £1.4 million expansion of its Metrolink tram system, aiming to double the size of the network by 2016. It needed an accompanying increase in revenues of 130% to meet capital investment repayments.

However, when the first new tramline to Chorlton opened in 2011, sales levels were more than 30% behind budget, indicating a mismatch between service delivery and public expectations. Design agency Hemisphere was asked to investigate this gap and recommend any service interventions that could help improve sales performance.

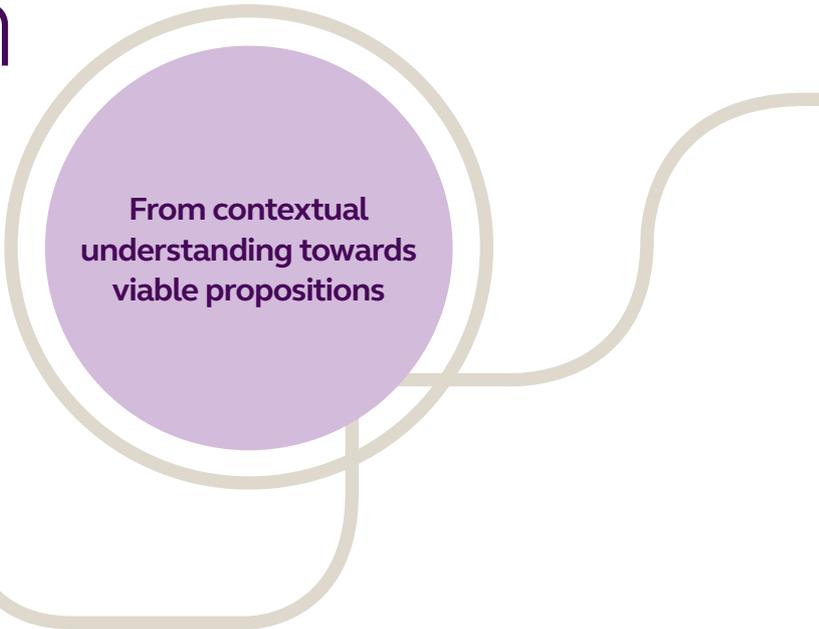
There were three key objectives of the partnership – to achieve the three-month

revenue target for the opening of the new Metrolink line to Oldham, to improve overall take-up of services and move customers towards simple transaction processes. Hemisphere tackled the project from all angles. It carried out more overt promotions of better-value products, removed the need for photo ID, devised a new zonal fare structure and made information more transparent.

The results were impressive. In its first year of operation, ticket sales for the new Metrolink line to Oldham outperformed expectations by 43%. TfGM reported that sales of weekly travel cards were up by an average of 155% on the previous year and that revenue from one-day travel cards had risen by 85%.

www.metrolink.co.uk
www.effectivedesign.org.uk/winners/2014/service-design/metrolink

How design in innovation works



The **Double Diamond**⁶ process model breaks the design process down into four consecutive phases of convergent and divergent thinking: **discover, define, develop** and **deliver**.

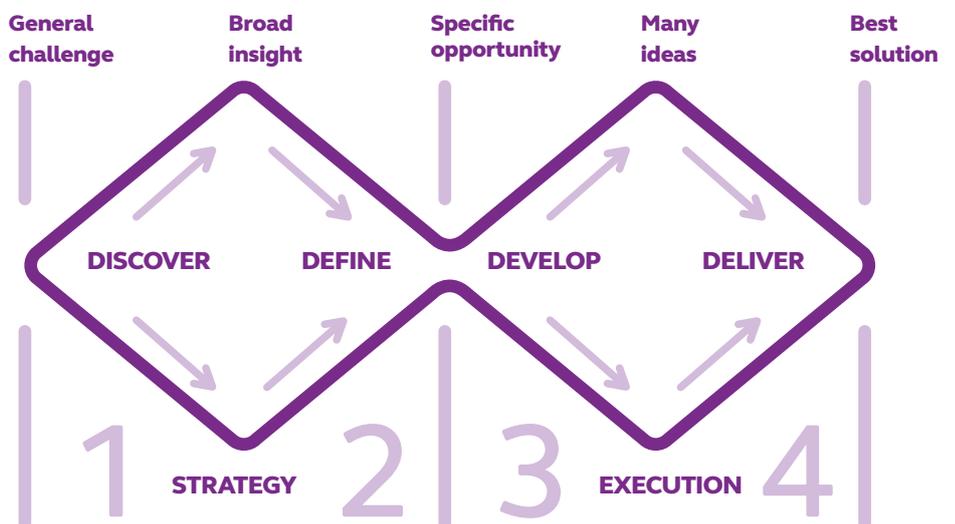
Many businesses are aware of design's role in the creation and development of ideas (**Phase 3: develop**) and the subsequent refinement of those ideas towards a final design solution (**Phase 4: deliver**).

Fewer businesses are aware of – or comfortable with exploiting – design's value as a strategic scoping and planning tool (**Phase 1: discover** and **Phase 2: define**).

This early-stage design activity involves the exploration of challenge areas

through the customers' eyes and in the context of social, environmental and business ecosystems. Insight gathered during this discovery phase is then synthesised to expose and define the most viable and economically valuable opportunities for innovation.

At the heart of this framework is the creative process that moves businesses from contextual understanding towards viable propositions and development towards opportunities. Designers are ideally equipped to help businesses make this transition.



The **Design Ladder**⁷ illustrates the different ways in which design is used within organisations.

There is a correlation between the value that businesses are able to realise from design and the extent to which design is embedded within the organisation: the earlier design is used – and the more strategic its role – the greater its benefit⁸.

Design has no impact at **Step 1**.

At **Step 2**, its role is reactive rather than proactive and, as such, its influence and value contribution are ultimately limited.

At **Step 3**, organisations routinely use good design processes throughout their innovation projects including from the earliest stages. Good design process is influential and effective in de-risking the innovation journey towards a successful outcome. With effective management, the return on design (and overall) investment can be high.

At **Step 4**, design is strategically integrated into the culture of the organisation and informs all aspects of business development. Design is represented at executive level within the organisation and investment in design is a core value generator for the business.

1 **No Design**
Little or no conscious design in product/ service development.

2 **Design as Styling**
Design is a late-stage styling activity only.

3 **Design as Process**
Design is routinely used from the early stages of the innovation process.

4 **Design as Strategy**
Design is integral to the organisation, driving and informing innovation strategy across all areas of the business.

The earlier the better

Case study

Owlstone Nanotech

Using design to explain technology applications and routes to market

Owlstone Nanotech was founded in 2004 by three Cambridge University researchers who had developed a ground-breaking chemical detection system.

With support from the Design Council, Owlstone used early-stage design to tackle the problems common to high-tech start-ups: how to explain their technology, attract investors and identify routes to market. Design exercises informed their decision to launch a digital tool allowing potential customers to evaluate the technology and its applications.

This approach provided a low-risk route to market and a fast return for investors. In combination with a strong brand identity and communications, this strategy helped to secure £1.25 million of fresh investment. Design is now integral to Owlstone's strategy, and design processes are routinely used to aid communication and inform decision-making.



Billy Boyle, co-founder and president, operations, at Owlstone, said: "Design has exposed us to new ideas we could use straightaway and which gave us shape and direction. Without it, we would have been a lot slower in getting to where we are."

Owlstone has attracted over £18 million in investment, including support from Innovate UK, and secured valuable contracts across the military, industrial, pharmaceutical, medical and scientific markets.

www.owlstonenanotech.com
www.designcouncil.org.uk/resources/case-study/owlstone

Owlstone has attracted over £18 million in investment, including from Innovate UK

Why is design a priority for us?

The UK is home to some of the world's most iconic brands

The UK has long been recognised as a centre for design excellence. Our design economy contributes £72 billion to the UK and makes up 7.2% of our total GVA.

It employs 1.6 million people – around 580,000 of these work in the UK's 72,340 design industry firms, with a further 1m employed in design roles across other sectors.¹⁰

The UK is home to some of the world's most successful design-led organisations and iconic brands, including Dyson, Unilever, Jaguar Land Rover, Virgin Atlantic and the BBC.

UK designers are much in demand internationally. Global brands including Samsung, IBM and Ford have chosen to take advantage of our world-class talent and locate their design centres in the UK.

The UK's design education system includes a number of cutting-edge and multidisciplinary programmes that link business and design. Of the top ten design schools in the world, three are in the UK (the Royal College of Art, the University

of the Arts, London, and the Glasgow School of Art).¹¹ Other world-renowned establishments include the universities of Bournemouth, Brunel, Cardiff, Central London, Coventry, Dundee, Edinburgh, Goldsmiths, Lancaster, Leeds, Loughborough, Newcastle, Northumbria, Reading, and Robert Gordon University.

An untapped potential

The UK has world-class design capabilities yet many businesses fail to recognise the potential of design to significantly improve their innovation results.¹² More than two-thirds of UK businesses never, or rarely, use design, or use design only at a late stage.¹³

We recognise that design is used too little and too late, if at all, in certain areas of the economy. This is particularly true among SMEs, scientists seeking to commercialise new ideas, and the public sector, although good progress has been made in this last instance more recently.¹⁴ In many cases design is considered 'nice to have' rather than a necessity and, as such, is often restricted to late-stage styling activity. Even fewer organisations use design at a strategic level or embrace leadership by design.

What are the opportunities for UK business?

Excellent design can be a catalyst for business success. Regardless of its type, size or sector, a business can use design to accelerate, de-risk and capture more value from its innovation programme.

Wherever there is potential for innovation to speed up economic growth, excellent design can help to unlock that potential and maximise the return on investment.

Using high-quality design at the start of a project can help businesses to:

- better understand their customers and end-users and, in so doing, create more desirable and fit-for-purpose products, services and processes
- develop more sustainable solutions and increase business resilience
- reduce innovation risk, timescales and cost
- differentiate their offerings in competitive markets
- identify and open up new markets
- communicate ideas and collaborate more effectively
- become more investor-ready
- strengthen their brand – increasing awareness, loyalty and advocacy among customers

These benefits translate into real commercial value for businesses. For every £1 invested in design, businesses might achieve:

- more than £20 in increased revenues
- an increase of more than £4 in net operating profit
- a return of over £5 in increased exports¹⁵

A wider economic value

Businesses that invest in high-quality design perform better across a number of metrics including the ability to secure investment, growth and market share.

This brings significant opportunities for businesses within the UK as well as for the UK economy as a whole.

Since 2007, Innovate UK has invested more than £1.5 billion of public money in innovation, helping over 5,000 businesses and adding an estimated £7.5 billion to the UK economy.¹⁶

We recognise design as a real opportunity to speed up and multiply the return on our investment – and that of our partners – across all our priority areas.

£20+

in increased
revenues

an increase of
£4+
in net operating
profit

£1

For every £1 invested
in design, businesses
might achieve:

a return of

£5+

in increased
exports

We'll do this by encouraging and enabling businesses to make more, and better, use of the UK's world-class design capability. Already, we've built active design-technology innovation communities through the work of the Knowledge Transfer Network (KTN) and our Design Special Interest Group (Design SIG), by supporting design events and studies, and through pilot investment mechanisms.

We've demonstrated the value of early-stage design in areas such as the digital economy, high-value manufacturing, stratified medicine, energy harvesting, low-impact building and the circular economy. Now, working alongside our partners, we will build on these foundations and deliver a scaled-up support programme for design in innovation.

What are the challenges for design in innovation?

Design has a proven role in increasing innovation and driving business success. The UK has a world-class design industry. So why aren't more businesses already investing in design within their innovation programmes?¹⁷

Innovate UK is working with design and business leaders to increase take-up by UK businesses. Together, we've identified four challenge areas that we're addressing: awareness, capability, culture and collaboration.

Awareness

In some businesses, there is little awareness and understanding of the role, application and value of design in innovation, especially in early-stage design.

In his 2005 Review of Creativity in Business¹⁸, Sir George Cox identified three barriers to greater creativity within small businesses.

These barriers also hinder the effective use of design:

- a limited understanding of where and how greater creativity could be used to business advantage
- a lack of confidence that the investment, in terms of time, money and disruption, will give a return
- a lack of knowledge of how to go about it, or where to turn for help

Capability

Some businesses appreciate the value of design but lack the necessary capability to procure and use design to maximum effect, either within their innovation programmes or at an organisation level.

As a result, they use too little design or none at all, or they use design that is inappropriate or of poor quality. Failure to realise design's full potential means that they also fail to capture the maximum value from their innovation programmes.

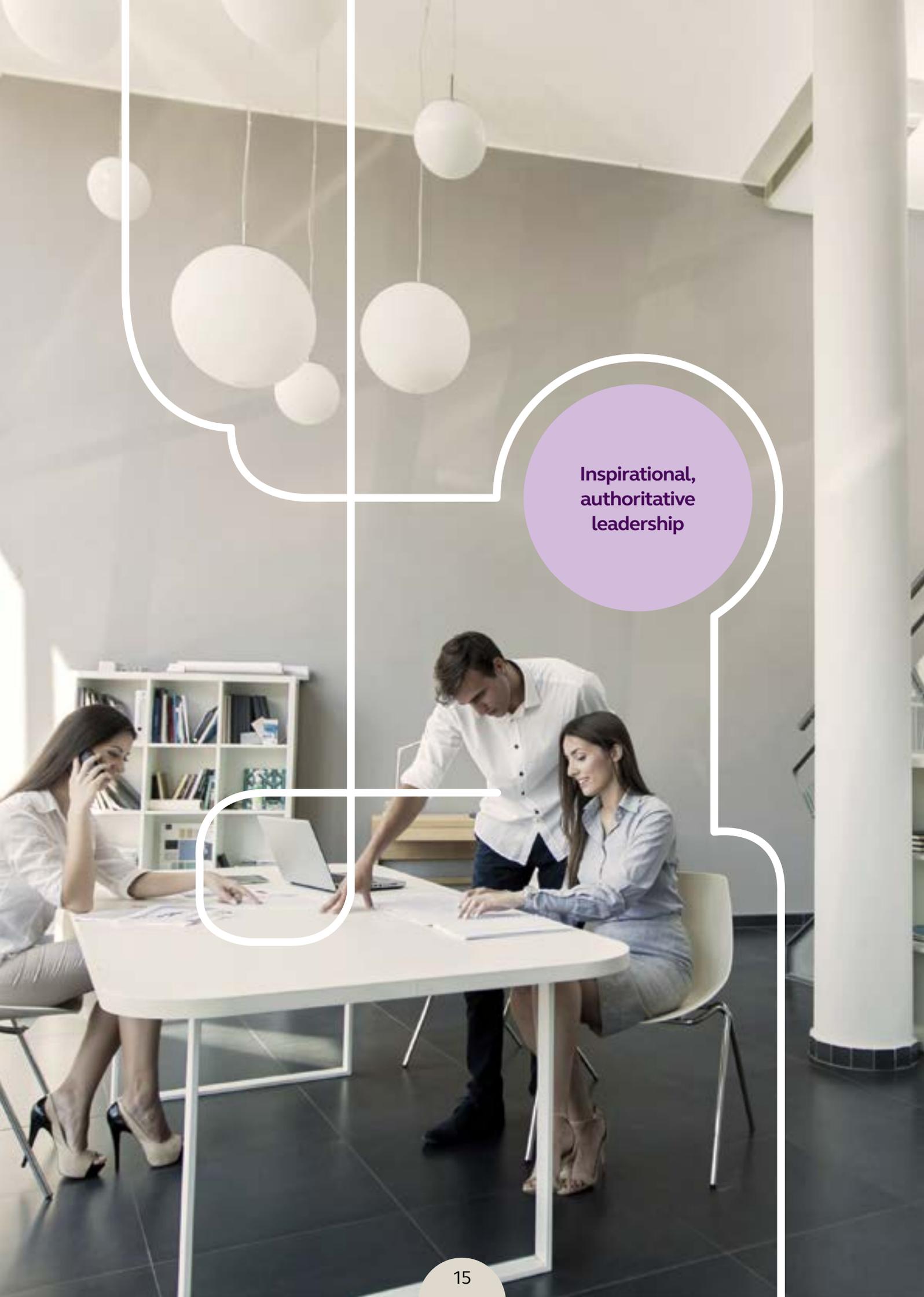
Culture

Design has the greatest positive impact on an organisation when it's embedded within its culture. Fostering a design-led culture may mean organisations have to step beyond their comfort zone, embrace new possibilities and adopt new ways of thinking.

Driving culture and behaviour change – especially within large and well-established organisations – requires an acknowledgment of what needs to change, commitment to action over the long term and inspirational, authoritative leadership.

Collaboration

Businesses need support to help them develop effective collaborations with the UK's design communities. This support will help them locate and engage with the high-calibre designers that are best equipped to respond to their specific challenges.



**Inspirational,
authoritative
leadership**

Our strategy for design in innovation

The main aims of this strategy are for UK businesses to innovate better, grow faster and achieve greater commercial success through the effective use of excellent early-stage design. The better UK businesses perform, the more the UK economy as a whole will benefit.

We will:

- 1 Advocate the use of excellent, early-stage design, and raise awareness of the value of design in innovation.**
- 2 Bring together design and technology communities, both nationally and locally.**
- 3 Fund high-quality, early-stage 'design foundations' activity in our priority areas to inspire better ideas for subsequent development.**
- 4 Invest in design across our portfolio as an allowable cost within collaborative, funded projects.**
- 5 Support knowledge sharing and capability building in design, including through KTPs and secondments.**

Our five-point plan for future growth

Innovate UK has set out a five-point plan to ensure we maximise the benefit of innovation for economic growth in the UK. Design has an important role to play in each area:

1 Accelerating UK economic growth

Through mechanisms including the Design Foundation, we will promote and support the use of excellent early-stage design within small, high-growth potential firms in key market sectors. Design is proven to accelerate growth and enhance commercial outcomes, helping to transform those businesses into high-growth mid-sized companies with strong productivity and export success.

2 Building on innovation excellence throughout the UK

We will engage with local design networks and clusters to understand and leverage their specific capabilities. We will invest locally to connect businesses with the skilled design practitioners best able to respond to their needs.

3 Developing Catapults within a national innovation network

We will work with the Catapults to enhance their capability to understand and use design, so that they can offer more effective support to innovators, and assist in connecting businesses with appropriate design delivery partners.

4 Working with the research community and across government

We will support the use of design earlier in the R&D process to enhance the commercial outcomes of research activity.

5 Evolving our funding models

We will use early-stage design processes to identify and target the most high-value innovation opportunities and to improve the return on our investments, helping public funding to go further and work harder. By supporting better design within UK businesses, we will improve their commercial propositions and investor readiness, helping to attract private sector investment.

References and sources

^{1,5,8} Warwick Business School and Design Council, 2014. *Leading Business by Design - Why and how business leaders invest in design.*

www.designcouncil.org.uk/sites/default/files/asset/document/dc_lbdd_report_08.11.13_FA_LORES.pdf

^{2,10} Design Council, 2015. *The Design Economy - The value of design to the UK.*

www.designcouncil.org.uk/sites/default/files/asset/document/The%20Design%20Economy%20executive%20summary.pdf

^{3,15} Design Council, 2012. *Design delivers for business - a summary of evidence from the Design Council's Design Leadership Programme.*

www.designcouncil.org.uk/sites/default/files/asset/document/DesignDelivers%20for%20Business%20briefing.pdf

^{4,13} European Commission, 2015. *Innobarometer 2015 - The Innovation Trends at EU Enterprises.*

<http://ec.europa.eu/COMMFrontOffice/PublicOpinion/index.cfm/ResultDoc/download/DocumentKy/67410>

⁶ Design Council, 2015. *The Design Process: What is the Double Diamond?*

www.designcouncil.org.uk/news-opinion/design-process-what-double-diamond

⁷ Danish Design Centre, 2015. *The Danish Design Ladder: Four steps of design use.*
<http://ddc.dk/en/2015/05/the-design-ladder-four-steps-of-design-use/>

⁹ Design Council, 2015. *Leading Business by Design: High-Value Manufacturing.*

www.designcouncil.org.uk/resources/report/leading-business-design-high-value-manufacturing

¹¹ QS World University Rankings by Subject 2015 - Art & Design

www.topuniversities.com/university-rankings/university-subject-rankings/2015/art-design

^{12,17} PA Consulting Group & George Freeman, MP, 2012. *How to unlock sustainable growth in the UK.*

www.paconsulting.com/our-thinking/uk-technology-growth-report/

and All-Party Parliamentary Design and Innovation Group (APDIG), 2012. *Design and Competitiveness - the APDIG response to Lord Heseltine's independent review of the UK's competitiveness.*

www.policyconnect.org.uk/apdig/sites/site_apdig/files/news/289/fieldnewsdownloads/apdigresponsetoheseltinereview.pdf

¹⁴ Department for Business, Innovation and Skills, 2011. *Innovation and Research Strategy for Growth.*

www.gov.uk/government/uploads/system/uploads/attachment_data/file/32450/11-1387-innovation-and-research-strategy-for-growth.pdf

¹⁶ Innovate UK, 2015.

www.gov.uk/government/organisations/innovate-uk/about

¹⁸ Sir George Cox for HM Treasury, 2005. *Cox Review of Creativity in Business.*

http://webarchive.nationalarchives.gov.uk/+/http://www.hm-treasury.gov.uk/coxreview_index.htm

Useful links

Innovate UK

www.innovateuk.gov.uk

British Industrial Design Association (BIDA)

www.britishindustrialdesign.org.uk

Crafts Council

www.craftscouncil.org.uk

Creative and Cultural Skills

www.ccskills.org.uk

Creative Scotland

www.creativescotland.com

D&AD Global Association for Creative Advertising & Design

www.dandad.org

Design in Action

www.designinaction.com

The Design Business Association (DBA)

www.dba.org.uk

Design Council

www.designcouncil.org.uk

Design for Europe

www.designforeurope.eu

Design Museum

www.designmuseum.org

Design Special Interest Group (Design SIG)

<https://connect.innovateuk.org/web/design-sig>

Design Wales

www.designwales.org

Institution of Engineering Designers (IED)

www.institution-engineering-designers.org.uk

Intellectual Property Office (IPO)

www.gov.uk/government/organisations/intellectual-property-office

Invest Northern Ireland, Design Programme

www.investni.com/support-for-business/products-and-services/design.html

Northern Ireland Design Alliance

www.nidesignalliance.com

Innovate UK

Innovate UK is the UK's innovation agency. Innovate UK works with people, companies and partner organisations to find and drive the science and technology innovations that will grow the UK economy – delivering productivity, new jobs and exports. Our aim at Innovate UK is to keep the UK globally competitive in the race for future prosperity.

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