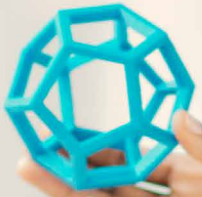
The Institution of Engineering and Technology

Design is everything



Increase value. Answer unmet needs.

#DesignIsEverything
theiet.org/design

About this booklet

This thought piece seeks to inspire, inform and influence engineers, designers, business owners, politicians, educators, and consumers on the importance of design.

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The author

#DesignIsEverything was written by David Wright and peer-reviewed by members of the IET's Design and Production Sector Executive Committee. David is director of Strategic Initiatives at Coventry University and was closely involved in the creation and delivery of the University's state-of-the-art National Transport Design Centre (NTDC), inspiring the next generation of vehicle designers. A qualified manufacturing engineer, David is a champion of design for all.

The IET

Registered as a Charity in England and Wales (No 211014) and Scotland (No SCO38698), the IET is a global professional engineering institution working to engineer a better world. Serving a membership of 167,000 engineers and technicians worldwide, our mission is to inspire, inform and influence the global engineering community supporting technology innovation to meet the needs of society.

Please note that the views expressed in this publication are not necessarily those of the IET.

#DesignIsEverything
Snappy title, isn't it?

But, when you think about it, design really *is* everything. How often do you hear something like 'better by design'; or 'we achieved our objectives by design'; 'we got there by design'? Let's face it, if it weren't by design it would be an accident, and I for one don't want to travel on anything which has been made accidentally!

Another great thing about 'Design' is that it is both a noun and a verb – how cool is that? I'm going to talk more about products than services, but in either case, the process by which we end up with a result **which delivers a desired outcome** is design.
I could just as easily talk about great, iconic designs and great designers and probably will at some point, but perhaps we should talk more about great design process.

And that is why design really is everything.

But wait, I hear you cry, what about manufacturing? Well, of course, manufacturing matters; but let me ask you this: which business stands a better chance of survival: one which starts out making a product that everyone wants, but less than optimally, or the business that makes a product that no-one wants, super-efficiently?

Is there a future in being the world's best typewriter maker? World class manufacturing is essential, but of itself it is not enough. **A well-designed product is a joy**, not just to behold, but at many levels. A well-designed product does what it sets out to do; **it makes us feel good**; in some cases, it makes a statement about us, what we believe and how we want to be regarded by other people.

We connect with good products at an emotional level, not just a practical one, even at a level which can border on tribalism. Android vs Apple anyone? Why on earth would anyone buy a Rolex instead of a Seiko quartz watch – or just use their mobile phone - if all they wanted to do was tell the time? A Rolex is a statement. Incidentally, a Longines is a far nicer statement... but that's tribalism for you!

> I, like many others, believe that **the lifeblood of innovation is creativity**, which the Oxford English Dictionary defines as: 'the use of imagination or original ideas to create something'.

All of us at the IET understand the importance of science, technology, engineering and maths (STEM), and we have been set square (pun intended) in its advocacy, within a balanced curriculum. As engineers, we understand that, in order to solve the complex engineering problems with which we are faced, and to manage the myriad constraints with which we must deal, **we must be creative in finding solutions**.

My personal view is that, we must be resolutely steadfast in recognising that **without creativity there is no invention** or innovation, and without innovation we cannot hope to be the productive, wealth-creating nation that we need to be.

> Though great British inventions of the past are important, **I care massively about what we have yet to invent**, and about having the imagination to do it before someone else does, and the nous to exploit it for the good of our society before someone else does.

I started writing this piece before we entered the COVID-19 pandemic crisis – remember those times? There have been many tragedies during that period, and the loss of so many lives has been truly devastating. I would like, however, to highlight one example amongst many from within our engineering and design community.

The Ventilator Challenge UK[1] brought together several well-known companies as a response to the need coming from the NHS for more life-saving devices. Synonymous with speed, one of the companies involved, was McLaren. We are used to being impressed with 0-60mph acceleration figures in under 3 seconds achieved by its road cars. What impressed me more was the consortium's ability to go from zero to the production of its first ventilator unit in under 100 hours. Let's be in no doubt; spectacular performance of that nature can't be achieved without **exceptional creativity, exceptional teamwork, and an exceptional design process**.

So, where am I going with all of this?
Bear with me, I'll work it out soon, I'm sure. Design matters, not just for products and services, but for businesses too. I'm not going to even attempt to give you all the answers – I simply don't have them; but what I will try to do is to get you thinking differently about design.

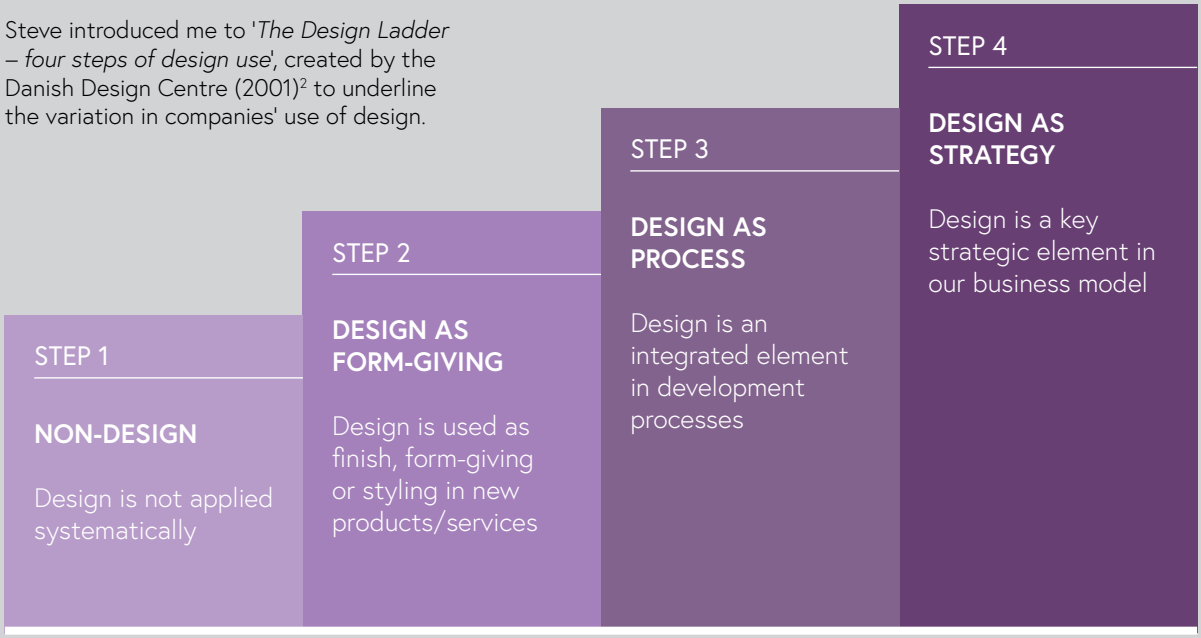
[1] The Ventilator Challenge UK https://www.ventilatorchallengeuk.com

The design ladder

In recent years I have become much more engaged with colleagues in the design community, from whom I have been fortunate to learn much, and many of whom are consummate professionals.

One of them is Steve May-Russell, CEO of industrial design consultancy, Smallfry and a former Chairman of the British Industrial Design Association (BIDA). He is a truly inspirational individual and is genuinely **passionate about the importance of design**.

Steve introduced me to '*The Design Ladder – four steps of design use*', created by the Danish Design Centre (2001)[2] to underline the variation in companies' use of design.



[2] 'The Design Ladder – four steps of design use', Danish Design Centre (2001) https://danskdesigncenter.dk/en/design-ladder-four-steps-design-use

A survey published by the Danish Design Centre in 2016[3], showed that **only 13 percent of companies had reached the top step of the Design Ladder**, and were using design as a key strategic driver within their businesses. Equally disturbing is the proportion of companies who hadn't even got off the first step yet, a sobering 40%.

More recent research by McKinsey[4] surveying 300 companies, 100,000 design actions and two million pieces of financial data found that **design-led companies enjoyed 32% more revenue and 56% higher total returns** to shareholders compared with other companies.

In the UK, research published by The Design Council (2018)[5] found that workers **with design skills contribute £209 billion in GVA (gross value added) to the UK economy**, with at least 2.5m people using design skills in their day-to-day work.

Now we're starting to get to the nub of why I'm happy to stand behind the statement...

#DesignIsEverything.

> The message is, to my ears, clear: if you want your business to be more successful, then you need to **put good design practice at the heart of it**. That way, you will create products, processes and services that out-perform those of your competitors.
> You will succeed. You will win.

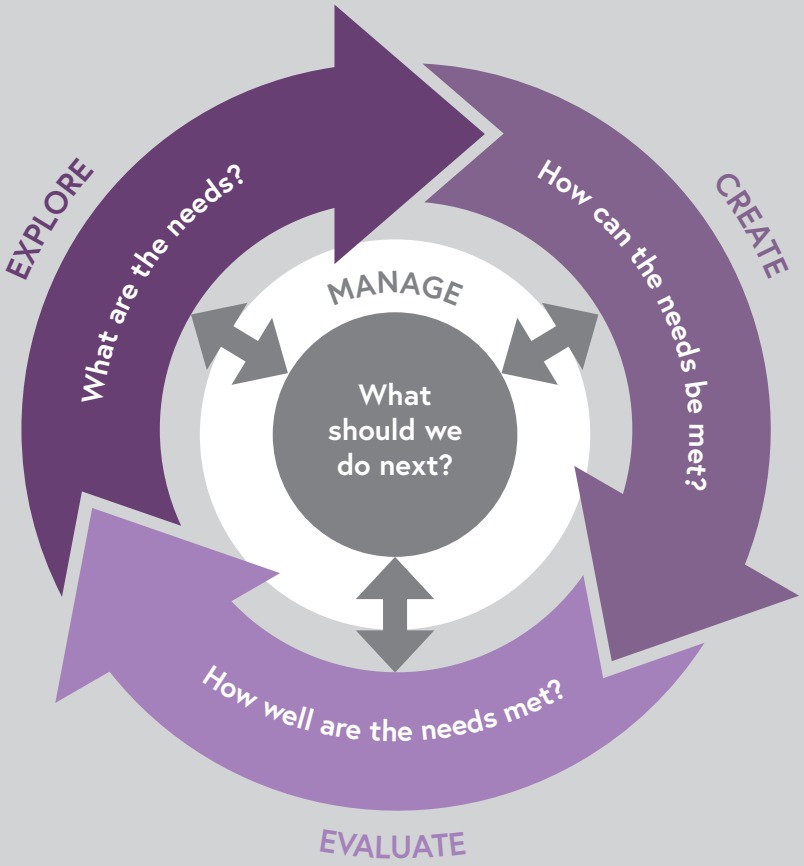
[3] https://issuu.com/dansk_design_center/docs/design_ladder_2016_eng
[4] 'The business value of design' McKinsey (2018) https://www.mckinsey.com/business-functions/mckinsey-design/our-insights/the-business-value-of-design
[5] 'Designing a Future Economy – developing design skills for productivity and innovation' The Design Council (2018) https://www.designcouncil.org.uk/sites/default/files/asset/document/Designing_a_future_economy18.pdf

Explore create evaluate

I was talking about this with Professor John Clarkson of the Engineering Design Centre at the University of Cambridge. He and his team **champion inclusive design** and have openly campaigned to encourage industry, academia and government to widely embrace a simple step process **'Explore create evaluate'**[6].

This approach goes way beyond any single product or industrial design situation. You can **apply it when designing anything and everything**.

I'm an engineer and I must say I'm rather partial to a diagram or three! Of course, there is no shortage of such 'do it this way' schematics, when it comes to doing design, or should I say, 'design thinking'!



With thanks to the Engineering Design Centre, Department of Engineering, University of Cambridge.

[6] 'Explore Create Evaluate' from the Inclusive Design Toolkit created by the Engineering Design Centre, Department of Engineering, University of Cambridge. http://www.inclusivedesigntoolkit.com/GS_overview/overview.html

Other design approaches that I would recommend are the Design Council's classic **'Double Diamond'**[7] framework for innovation, also the Nielsen Norman Group's **'Design Thinking 101'** diagram[8] (I especially like that one, given it's got a rocket in it).

When we think about design, we also talk about systems and, increasingly, systems of systems. Thanks to powerful computing and connectivity, amongst other things, the world we live in has become a much smaller place. We have never had as much information at our fingertips as we have today, data which we can use when we're designing things.

By harnessing the power of data and taking a systems approach, we can combine user-centred design thinking processes together with all the influences and inter-dependencies which come from engineering, manufacturing and finance. We can design **outstanding solutions which address unmet needs and create value for society**.

Right! I think I know where I was trying to go with this (about time, I hear you cry). As the IET, we're great at engineering, great at technology, manufacturing too. As a leading charitable institution, providing public benefit, I believe that we have a golden opportunity, perhaps even a responsibility, to **raise the level of awareness of just how important design is** in enabling the world to forge a healthy and prosperous future!

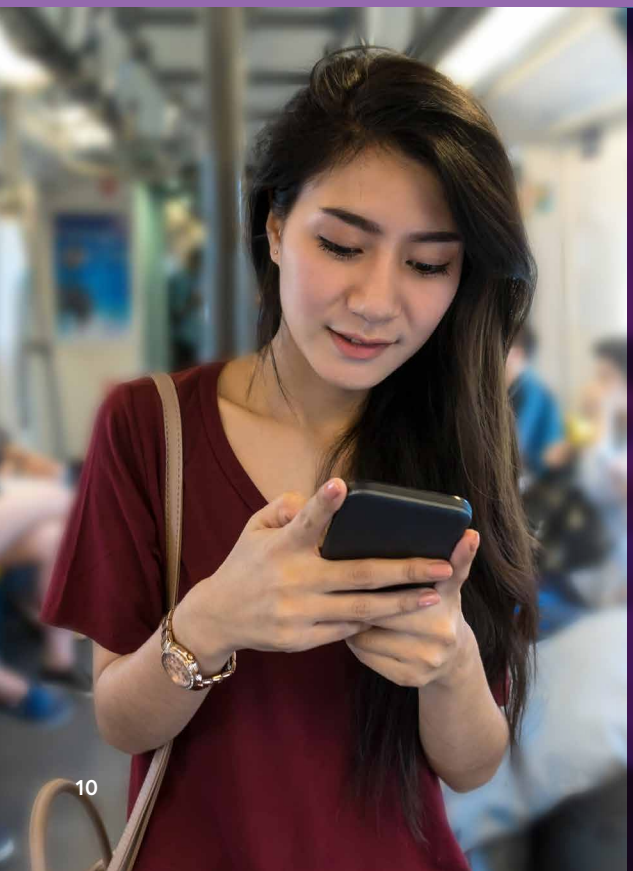
> I hope that, by now, you're starting to agree with me that **#DesignIsEverything**. What are your thoughts? Whether you're an engineer, designer, business owner, student, or consumer your views are important to us.

[7] 'Double Diamond' framework for innovation https://www.designcouncil.org.uk/news-opinion/what-framework-innovation-design-councils-evolved-double-diamond

[8] 'Design Thinking 101', The Nielsen Norman Group (2016) https://www.nngroup.com/articles/design-thinking

Get involved

Help us to get the message out in front of politicians, educators and companies that 'business as usual is not an option'. By adopting design as strategy in all things, we can safely and successfully emerge to brighter, better days.



Send us your thoughts on what the phrase #DesignIsEverything means to you

Ideally, 50-100 words would be perfect. We'll be collecting your contributions with the view to publishing them on our online design hub at **www.theiet.org/design**. Email them to **sep@theiet.org** using **#DesignIsEverything** in the 'Subject' line.

Send us your photo of a design which inspires you

Perhaps it's something you use every day, a product, service, system or process. Once again, we'll be collating your entries with the view to online publication.

Send your words or pictures on Twitter, Instagram, LinkedIn and Facebook

Use the hashtag **#DesignIsEverything @TheIET**

A special call-out to engineers and designers!

We know engineers make great designers. We'd like to encourage you to bring out your 'inner designer'. Whether you're actively involved in design or not, designing directly yourself or involved in design as either a commissioner or user.

Tell us about the design processes you favour most and do share your design stories with us. Case studies are a great way to get the message across.

- With your permission we will publish your response on our 'Design Hub'.
- For those interested in engaging with us we would like to invite you to connect with fellow professionals who share an interest in 'design'

You don't have to be an IET member to engage.

Get in touch, we'd love to hear from you. Contact us today by email at sep@theiet.org or via our social channels. Thank you!

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