Design thinking
– a wicked problem

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Design thinking is big business

At the time of writing, a Google search for the exact phrase 'design thinking' yielded over 13 million results. As a comparison, the term 'Bauhaus' yielded 39 million. This relatively close ratio of 1:3 is surprising given that Bauhaus was a highly influential design movement studied extensively over the last century, while design thinking is a more recent term. A library search limited to academic and scholarly literature reveals an even closer ratio of 1:1.75 (Design Thinking 7,596; Bauhaus 9,694).

Whatever the reasons behind these figures, the proliferation of resources available indicates a lot of people are researching, talking about, teaching or practising design thinking.

The evolution of design thinking

The concept of design as a way of thinking is not new. Don Norman, author of *Design of Everyday Things*[1], believes design thinking "has been practised for millennia by great thinkers in every discipline from literature to engineering, art to physics".[2]

Leonardo da Vinci, 16th century polymath, could be considered a design thinker. His creativity spread across the arts, sciences and humanities, he was constantly questioning and prototyping, and he "envisioned what innovators would invent centuries later."[3] Tim Brown (chairman of IDEO, a consultancy that champions design thinking) considers the prolific 19th century engineer Brunel as one of the first design thinkers.[4]

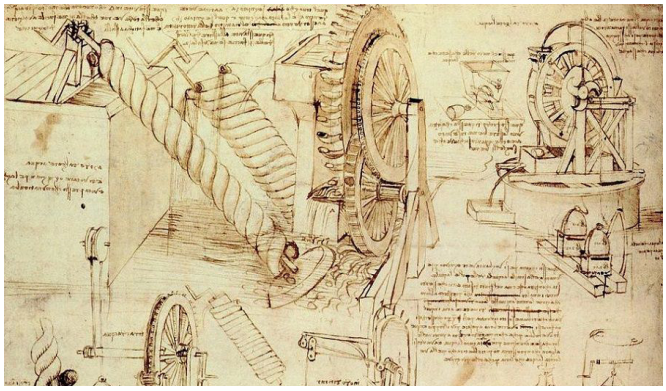

Figure 1 Leonardo da Vinci's sketch of water-lifting devices[27]

IDEO are recognised for bringing design thinking to the mainstream, but the concepts behind design thinking have evolved over time, as shown below.

1960s

Human-centric design for complex problems: In the early 1960s, R. Buckminster Fuller called for a 'design science revolution' to solve human and environmental problems, while Horst Rittel wrote about problem solving in design, especially in relation to complex multi-dimensional problems, which he called 'wicked problems'.

1970s

Everyone designs: In 1969 Herbert A Simon, in his book Sciences of the Artificial, said design wasn't just practised by designers. "Everyone designs who devises courses of action aimed at changing existing situations into preferred ones"[6]. He believed the intellectual activity involved in designing objects was no different from the process of creating solutions in fields such as business, law and medicine.[7]

Design for innovation: In 1972 Victor Papanek said design should focus on human needs and moral responsibilities, believing innovation comes from reducing the complex to the simple.[8]

1980s

Applying design methods to non-design problems: In 1982 Nigel Cross published Designerly Ways of Knowing, comparing how designers solve problems with how everyday problems are approached. A few years later, architect Peter Rowe's 1987 book Design Thinking analysed problem solving processes in architecture and urban planning.

1990s

Design thinking as a service: In 1991 consulting firm IDEO formed, offering design thinking as a way of solving business and societal problems. In 2005, IDEO's David Kelley co-founded an academic institute of design thinking at Stanford University, known as d.school. Since then, design thinking has been adopted widely, seen as a means to generate innovative solutions for a wide range of problems.

2000s

Table 1 Timeline of key concepts in design thinking[5]

What is design thinking?

The term design thinking is used so widely that, just like the parable of the blind men and the elephant[9], it means different things to different people depending on where they stand. Here are a few perspectives:

Design thinking is an approach. IDEO's Tim Brown says design thinking is "a human-centred approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success."[11]

Design thinking makes people creative. David Kelley, IDEO co-founder, says design thinking is a way to "unlock your creativity and make you feel capable of coming up with routinely wonderful ideas".[11]

Design thinking is a process. Bill Moggridge, also a co-founder of IDEO, said design thinking is "the application of well-tried design process to new challenges and opportunities". He believed the process embraces intuition and uses insights buried in our subconscious because conscious thinking stifles innovation.[12]

Design thinking is a mindset. Paola Antonelli from Rotman School of Management talks about it as a way of thinking: "Design is about rethinking what you are doing. Make no mistake: it is not a route to easy answers. Rather than solving problems, design finds problems, and rather than providing answers, it asks questions."[13]

Design thinking is a mix of methods and tools. Jim Hartzfield, head of agency Perficient Digital says "Design thinking is a loose federation of methods and tools to help us think differently with our clients and the complex, non-linear, human-centered problems that blanket their customer-driven world."[14]

Design thinking is more culture than methodology. Writer MaryAnne Gobble says building a culture of human-centred design thinking requires organisations to rethink their culture and approach to innovation.[15]

Design thinking is a set of techniques. Don Norman describes design thinking as a process of determining the correct problem before working toward a solution, using a collection of techniques:

- Human-centred: deep understanding/empathy
- Questioning: question the problem, assumptions and implications
- Ongoing experimentation: prototyping, trying out ideas[16]

To summarise the above: design thinking is a mindset with which to approach complex problems by centring on human needs, armed with processes, tools and techniques that involve questioning assumptions and prototyping ideas in an iterative way, with the aim of generating innovative solutions.

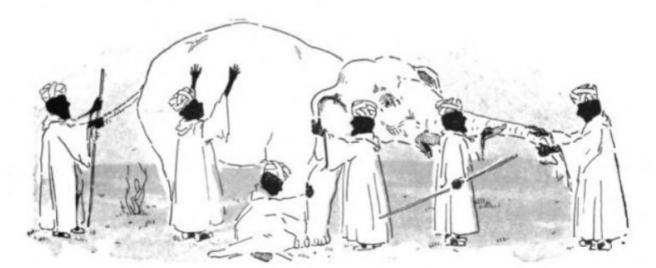

Figure 2 Blind men and an elephant[9]

How is design thinking being used?

Design thinking is being applied to areas as diverse as engineering, education, food, public health, social innovation, experience design, product development, programming, town planning, branding, nursing and business management.

In particular, design thinking is being used to address complex ('wicked') societal or business problems, although the process is not always labeled as such. Designer/educator Jon Kolko mentions a number of examples (such as designer Lauren Serota's work in Myanmar communities) and makes the point that these involve practising designers, not just people "doing design thinking".[17]

Current examples of design thinking in use include:

- **Social innovation:** Frog Design developed a *Collective Action Toolkit* for NGOs to use design thinking to enable change in communities.[18]
- **The circular (sharing) economy:** The Ellen Macarthur Foundation and IDEO created *The Circular Design Guide* to help people use design thinking to innovate and create business opportunities in the circular economy.[19]
- **Sustainability:** The Agency of Design (UK) create innovative solutions by starting with human needs, researching ideas and prototyping multiple solutions, although they don't call it design thinking. A great example of this is their toaster project, with three solutions designed around the interaction between consumer, manufacturer and recycler.[20]
- **Simple problems:** Design thinking can be applied to problems as simple as planning a designer's portfolio, according to the Interaction Design Foundation (IDF), who offer design thinking courses.[21]

> ***"Rather than solving problems, design finds problems, and rather than providing answers, it asks questions."***
>
> Paola Antonelli

Criticisms of design thinking

A number of design practitioners and researchers have questioned the value of design thinking and how it is implemented. Critics include Pentagram Design partner Natasha Jen, who has said design thinking is a commercialisation of the processes designers have used for ages, believing it is an overly prescriptive approach that claims to solve a multitude of problems without the necessary design critique.[22] Lee Vinsel goes further, comparing design thinking to syphilis because it will "rot your brain". He says design thinking is not the secret weapon it is made out to be, and is "little more than floating balloons of jargon, full of hot air".[23]

In the article *Paradoxes in Design Thinking* Rodgers, Innella and Bremner write that current design thinking practices result in imitation and derivation. They propose that to innovate, designers should be focusing on what they don't know, because "it is highly likely that they have been looking in the wrong places."[24]

Designer Lillian Ersoy says design thinking is failing because the collaboration of designers with large teams of stakeholders results in mediocre solutions and designers are being de-skilled by working in this environment.[25]

The way forward: use design thinking on itself

Design thinking has proven its value via numerous success stories, but appears to be a victim of its own success. Although based on tenets of good design practice, its widespread adoption by non-designers (often with unrealistic expectations of guaranteed innovations) has watered down its effectiveness. This does not mean it should be discarded, however. Human-centred design is a worthy approach.

One way to determine a way forward is to think about the issue of designing for innovation as a complex, multi-dimensional **wicked problem**, and use design thinking to address that problem. In other words, advance the theory by applying it to itself.

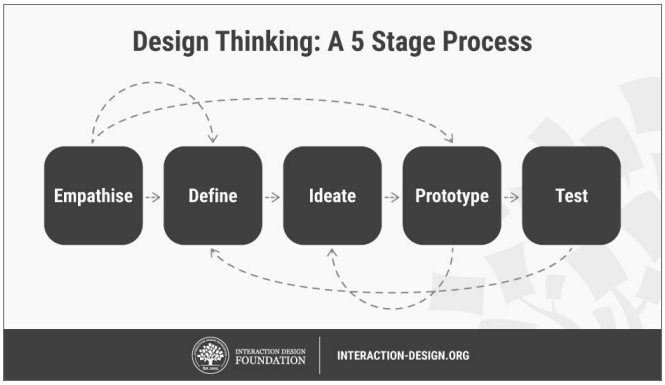

Figure 3 Five stage design thinking model[26]

Making it happen

Following the five-stage version of the design thinking model proposed by Stanford's d.school and used by IDF, the process for a project to take a fresh look at design thinking would be:

1. **Empathise:** step into the shoes of all those involved in or affected by design thinking—designers, consultancies, business users, NGOs, academics, consumers and other stakeholders—to determine what their real issues, needs, thoughts and feelings are in relation to design thinking and innovation. Involve them as collaborators on the project.
2. **Define:** based on stakeholder insights, decide what the real problem is in human terms. For example, is it about a constant need for innovations, a desire for collaboration, a necessity to grow business income, concern about quality of design practice, or striving for ways to improve human society? Look in new places to find the unknowns (as suggested by Rodgers et al)
3. **Ideate:** generate ideas for how the restated problems could be addressed, by questioning assumptions about current design and innovation practice and putting all stakeholders at the centre of the picture.
4. **Prototype:** select a range of ideas, and create prototype processes, tools, value sets, scenarios, learning resources, collaboration guides or even a draft manifesto for design thinking.
5. **Test:** try out prototypes with stakeholders, constantly refining and testing, implement pilot solutions and improvements, repeating the cycle…

What would be the end result of such a project? Most likely it would never end, but along the way it could reveal some useful insights to improve society and inform ongoing design practice.

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