

Change...by Design

by Tim Brown (2009)

A summary of highlights compiled by Michael Keller.

We are at a critical point where rapid change is forcing us to look not just at new ways of solving problems but to new problems to solve. (p. 153)

Technology still has not run its course. The communications revolution sparked by the Internet has brought people closer together and given them the opportunity to share perspectives and create new ideas as never before. The sciences of biology, chemistry, and physics have merged in the forms of biotechnology and nanotechnology to create the promise of lifesaving medicines and wondrous new materials. But these spectacular achievements are unlikely to help us reverse our ominous course. Just the opposite.

We need new choices (p. 3)

A purely technocentric view of innovation is less sustainable now than ever, and a management philosophy based only on selecting from existing strategies is likely to be overwhelmed by new developments at home or abroad. ***What we need are new choices*** – new products that balance the needs of individuals and of society as a whole; new ideas that tackle the global challenges of health, poverty, and education; new strategies that result in differences that matter ***and a sense of purpose that engages everyone affected by them.*** It is hard to imagine a time when the challenges we faced so vastly exceeded the creative resources we have brought to bear on them....

What we need is an approach to innovation that is powerful, effective, and broadly accessible, that can be integrated into all aspects of business and society, and that individuals and teams can use to generate breakthrough ideas that are implemented and that therefore have an impact. ***Design thinking... offers just such an approach.***



...By integrating what is desirable from a human point of view with what is technologically feasible and economically viable, designers have been able to create the products we enjoy today. Design thinking takes the next step, ***which is to put these tools into the hands of people who may have never thought of themselves as designers and apply them to a vastly greater range of problems.***

Design thinking taps into capacities we all have but that are overlooked by more conventional problem-solving practices. It is not only human-centered; it is deeply human in and of itself. Design thinking ***relies on our ability to be intuitive***, to recognize patterns, to construct ideas that have emotional meaning as well as functionality, ***to express ourselves in media other than words or symbols.*** Nobody wants to run a business based on feeling, intuition, and inspiration, but an over-reliance on the rational and the analytical can be just as dangerous. ***The integrated approach at the core of the design process suggests a “third way.”*** (p. 4)

The term “design thinking”...I now use it as a way of describing ***a set of principles that can be applied by diverse people to a wide range of problems.*** I have become a convert and an evangelist of design thinking. (p. 6)

And I am not alone. Today, rather than enlist designers to make an already developed idea more attractive, the most progressive companies are challenging them to create ideas at the outset of the development process. The former role is tactical; it builds on what exists and usually moves it one step further. The latter ***is strategic; it pulls “design” out of the studio and unleashes its disruptive, game-changing potential.*** (p. 7)

Moreover, the principles of design thinking turn out to be applicable to a wide range of organizations, not just companies in search of new product offerings. A competent designer can always improve upon last year’s new widget, but ***an interdisciplinary team of skilled design thinkers is in a position to tackle more complex problems.*** ...As the center of economic activity in the developing world shifts inexorably from industrial manufacturing to knowledge creation and service delivery, innovation has become nothing less than a survival strategy. It is, moreover, ***no longer limited to the introduction of new physical products but includes new sorts of processes, services, interactions, entertainment forms, and ways of communicating and collaborating.*** ...The natural evolution from *design doing* to *design thinking* reflects the growing recognition on the part of today’s business leaders that ***design has become too important to be left to designers.*** (p. 8)

Three spaces of innovation (p. 15)

Although I would love to provide a simple, easy-to-follow recipe that would ensure that every project ends successfully...the nature of design thinking makes that impossible. In contrast to the champions of scientific management at the beginning of the last century, design thinkers know that **there is no “one best way” to move through the process**. There are useful starting points and helpful landmarks along the way, but **the continuum of innovation is best thought of as a system of overlapping spaces** rather than a sequence of orderly steps. We can think of them as

- (1) **inspiration**, the problem or opportunity that motivates the search for solutions;
- (2) **ideation**, the process of generating, developing, and testing ideas;
- (3) and **implementation**, the path that leads from the project room to the market.

Projects may loop back through these spaces more than once as the team refines its ideas and explores new directions. (p. 16)



The reason for the iterative, nonlinear nature of the journey is not that design thinkers are disorganized or undisciplined but that **design thinking is fundamentally an exploratory process**; done right, it will invariably make unexpected discoveries along the way, and it would be foolish not to find out where they lead. Often these discoveries can be integrated into the ongoing process without disruption. At other times **the discovery will motivate the team to revisit some of its most basic assumptions...** seen not as a system reset but as a meaningful upgrade.

The risk of such an iterative process is that it appears to extend the time to get an idea to market, but this is often a shortsighted perception. To the contrary, a team that understands what is happening will not feel bound to take the next logical step along an ultimately unproductive path. ...A nimble team of design thinkers will have been prototyping from day one and self correcting along the way. As we say at IDEO, **“Fail early to succeed sooner.”** (p. 17)

In so far as it is open-ended, open-minded, and iterative, a process fed by design thinking **will feel chaotic to those experiencing it for the first time**. But over the life of a project, it invariably comes to make sense and achieves results that differ markedly from the linear, milestone-based processes that define traditional business practices. ...It is better to take an experimental approach: **share processes, encourage the collective ownership of ideas, and enable teams to learn from one another.** (p. 17)

A second way to think about the overlapping spaces of innovation is in terms of **boundaries**. To an artist in pursuit of beauty or a scientist in search of truth, the bounds of a project may appear as unwelcome constraints. But **the mark of a designer...is the willing embrace of constraints.** (p.17)

Without constraints design cannot happen...

The willing and even **enthusiastic acceptance of competing constraints is the foundation of design thinking**. The first stage of the design process is often about discovering which constraints are important and establishing a framework for evaluating them. Constraints can best be visualized in terms of **three overlapping criteria for successful ideas**:

- (1) **feasibility** (what is functionally possible within the foreseeable future);
- (2) **viability** (what is likely to become part of a sustainable business model);
- (3) and **desirability** (what makes sense to people and for people).

A competent designer will resolve each of these three constraints, but **a ‘design thinker’ will bring them into a harmonious balance.** (p. 18)

This pursuit of peaceful coexistence does not imply that all constraints are created equal; a given project may be driven disproportionately by technology, budget, or a volatile mix of human factors. Different types of organizations may push one or another of them to the fore. Nor is it a simple linear process. Design teams will cycle back through all three considerations throughout the life of a project, but **the emphasis on fundamental human needs** – as distinct from fleeting or artificially manipulated desires – **is what drives design thinking to depart from the status quo.** (p. 19)

The project (p. 21)

Designers, then, have learned to excel at resolving one or another or even all three of these constraints. **Design thinkers, by contrast, are learning to navigate between and among them in creative ways.** They do so because they have **shifted their thinking from problem to project.**

The project is the vehicle that carries an idea from concept to reality. Unlike many other processes we are used to – from playing the piano to paying our bills – a design project is not open-ended and ongoing. ***It has a beginning, a middle, and an end,*** and it is precisely these restrictions that anchor it to the real world. That design thinking is expressed within the context of a project ***forces us to articulate a clear goal at the outset.*** It creates natural deadlines that ***impose discipline*** and give us an opportunity to review progress, make midcourse corrections, and redirect future activity. The clarity, direction, and limits of a well-defined project are ***vital to sustaining a high level of creative energy.***

The brief (p. 22)

The classic starting point of any project is the brief... a set of mental constraints that gives the project team a ***framework*** from which to begin, ***benchmarks*** by which they can measure progress, and a set of ***objectives*** to be realized... Just as a hypothesis is not the same as an algorithm, the project brief is not a set of instructions or an attempt to answer a question before it has been posed. Rather, a well-constructed brief ***will allow for serendipity, unpredictability, and the capricious whims of fate,*** for that is the creative realm from which breakthrough ideas emerge. ***If you already know what you are after, there is usually not much point in looking.*** (p. 23)

...A design brief that is too abstract risks leaving the project team wandering about in a fog. One that starts from too narrow a set of constraints, however, almost guarantees that the outcome will be incremental and, most likely, mediocre...midcourse adjustments are common and are a natural feature of a process that is healthy, flexible, and dynamic. ...***design thinking needs to be practiced on both sides of the table: by the design team, obviously, but by the client as well.*** (p. 25)

Teams of teams -- ***“All of us are smarter than any of us.”*** (p. 28)

...When a team of talented, optimistic, and collaborative design thinkers comes together, a chemical change occurs that ***can lead to unpredictable actions and reactions.*** To reach this point, however, we have learned that ***we must channel this energy productively,*** and one way to achieve this is to do away with one large team in favour of many small ones.

Though it is not uncommon to see large creative teams at work, it is nearly always in the implementation phase of the project; ***the inspiration phase,*** by contrast ***requires a small, focused group whose job is to establish the overall framework.***



Cultures of innovation (p. 32)

To be creative, a place does not have to be crazy, kooky, and located in northern California. What is a ***prerequisite is an environment*** – social but also spatial – ***in which people know they can experiment, take risks, and explore the full range of their faculties.*** ...A culture that believes that it is better to ask forgiveness ‘afterward’ rather than permission ‘before’, that rewards people for success but gives them permission to fail, has removed one of the main obstacles to the formation of new ideas.

...The problems that challenged designers in the twentieth century – crafting a new object, creating a new logo, putting a scary bit of technology into a pleasing or at least innocuous box – are simply not the problems that will define the twenty-first century. If we are to deal with what Bruce Mau has called the “massive change” that seems to be characteristic of our time, ***we all need to think like designers.*** (p. 37)

Just as I am challenging companies to incorporate design into their organizational DNA, however, I want to challenge designers to ***continue the transformation of design practice itself.*** ...the seismic shifts taking place in every industry demand a new design practice: ***collaborative*** but in a way that amplifies, rather than subdues, the creative powers of individuals; ***focused*** but at the same time flexible and responsive to unexpected opportunities; focused not just on optimizing the social, the technical, and the business components of a product but on ***bringing them into harmonious balance.*** The next generation of designers will need to be as comfortable in the boardroom as they are in the studio... (p.37)

Converting need into demand, or putting people first (p. 39)

For design thinkers...behaviours are never right or wrong, but they are always meaningful.

The job of the designer, to borrow a marvelous phrase from Peter Drucker, is **“converting need into demand.”** On the face of it, this sounds simple: just figure out what people want and then give it to them. But if it’s so simple, why don’t we see more success stories like the iPod? The Prius? MTV and eBay? The answer, I’d suggest, is that **we need to return human beings to the center of the story. We need to learn to put people first.**

Much has been written about **“human-centered design” and its importance to innovation.** Since there are so few truly compelling stories, however, it’s time to ask why it is so difficult to spot a need and design a response. The basic problem is that **people are so ingenious at adapting to inconvenient situations that they are often not even aware that they are doing so:** they sit on their seat belts, write their PINs on their hands, hang their jackets on doorknobs, and chain their bicycles to park benches. Henry Ford understood this when he remarked, “If I’d asked my customers what they wanted, they’d have said ‘a faster horse.’” This is why **traditional techniques such as focus groups and surveys**, which in most cases simply ask people what they want, **rarely yield important insights.** The tools of conventional market research can be useful in pointing toward incremental improvements, but they will never lead to those rule-breaking, game-changing, paradigm-shifting breakthroughs that leave us scratching our heads and wondering why nobody ever thought of them before.

Our real goal, then, is not so much fulfilling manifest needs by creating a speedier printer or a more ergonomic keyboard; that’s the job of designers. It is **helping people to articulate the latent needs they may not even know they have**, and this is the challenge of ‘design thinkers.’ How should we approach it? What tools do we have that can lead us from modest incremental changes to the leaps of insight that will redraw the map? ...[there are] **three mutually reinforcing elements of any successful design program:**

- **insight**,
- **observation**,
- **empathy.** (p. 40)

Insight: learning from the lives of others (p. 40)

Insight is one of the key sources of design thinking, and it does not usually come from reams of quantitative data that measure exactly what we already have and tell us what we already know. A better starting point is to **go out into the world and observe the actual experiences [of people] as they improvise their way through their daily lives...**their actual behaviours, however, can provide us with invaluable clues about their range of unmet needs.

...In a ‘design’ paradigm, however, **the solution** is not locked away somewhere waiting to be discovered but **lies in the creative work of the team.** The creative process generates ideas and concepts that have not existed before. These are more likely to be triggered by observing the odd practices of an amateur carpenter or the incongruous detail in a mechanic’s shop than by hiring expert consultants or asking “statistically average” people to respond to a survey or fill out a questionnaire. (p. 41)

The evolution from ‘design’ to ‘design thinking’ is the story of the evolution from the creation of products to the analysis of the relationship between people and products, and from there to the relationship between people and people...the migration of designers toward social and behavioural problems... (p. 42)

Observation: watching what people don’t do, listening to what they don’t say (p. 43)

...almost every project we undertake involves an intensive period of observation. We watch what people do (and do not do) and listen to what they say (and do not say).

There is nothing simple about determining whom to observe, what research techniques to employ, how to draw useful inferences from the information gathered, or when to begin the process of synthesis that begins to point us toward a solution. As any anthropologist will attest, **observation relies on quality, not quantity...[a willingness to] learn something new and surprising. For insights at that level we need to head for the edges, the places where we expect to find “extreme” users who live differently, think differently, and consume differently...** (p. 44) ...observing “analogous” situations will often jolt us out of the frame of reference that makes it so difficult to see the larger picture. (p. 48)

Empathy: standing in the shoes (or lying on the gurneys) of others (p. 49)

It's possible to spend days, weeks, or months conducting research of this sort, but at the end of it all we will have little more than stacks of field notes, videotapes, and photographs unless we **connect with the people we are observing at a fundamental level**. We call this "empathy," and it is perhaps the most important distinction between academic thinking and design thinking...to translate observations into insights and insights into products and services that will improve lives. ...**we need to begin by recognizing the [people's] seemingly inexplicable behaviours represent different strategies for coping with the confusing, complex, and contradictory world in which they live**. (p. 49) We build these bridges of insight through empathy, the effort to see the world through the eyes of others, understand the world through their experiences, and feel the world through their emotions. (p. 50)

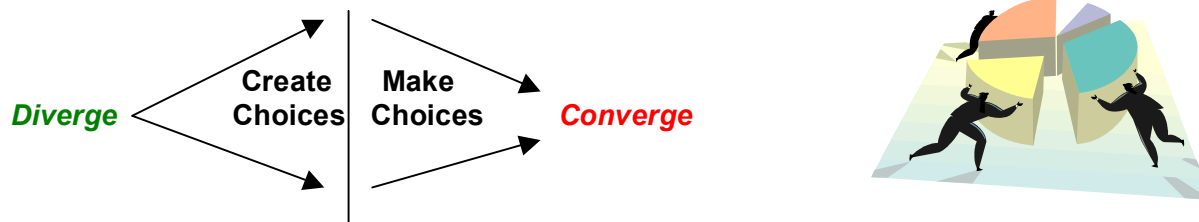
A designer, no less than an engineer or marketing executive, who simply generalizes from his own standards and expectations will limit the field of opportunity.

Convergent and divergent thinking (p. 66)

To experience design thinking is to engage in a dance among four mental states. Each has its own moods and manners, but when the music suddenly starts it can be difficult to recognize where we are in the process and which is the right foot to put forward.

Woven into the fabric of **our culture is an emphasis on thinking based upon logic and deduction...** **[we] are taught to take a series of inputs, analyze them, and then converge upon a single answer**. At times we may find that the best – as opposed to the right – answer will have to do or that we may have to choose among equally compelling alternatives. Just think about the last time that you and five friends had to agree on where to go out for dinner. Group thinking tends to converge toward a single outcome.

Convergent thinking is a practical way of deciding among existing alternatives. **What convergent thinking is not so good at, however, is probing the future and creating new possibilities.**



If the convergent phase of problem solving is what drives us towards solutions, **the objectives of divergent thinking is to multiply options to create choices**. (p. 67) Divergent thinking is the route, not the obstacle, to innovation. (p. 68)

The process of the design thinker, rather, looks like a rhythmic exchange between the divergent and convergent phases, with each subsequent iteration less broad and more detailed than the previous ones. In the divergent phase, new options emerge. In the convergent phase it is just the reverse: now it's time to **eliminate options and make choices**. (p. 68)

A culture of optimism (p. 76)

The obvious counterpart to an attitude of experimentation is a climate of optimism. Sometimes the state of the world makes this difficult to sustain, but the fact remains that **curiosity does not thrive in organizations that have grown cynical**. Ideas are smothered before they have a chance to come to life. People willing to take risks are driven out. Up-and-coming leaders steer clear of projects with uncertain outcomes out of fear that participation might damage their chances for advancement. Project teams are nervous, suspicious, and prone to second-guessing what management "really" wants. **Even when leadership wants to promote disruptive innovation and open-ended experimentation, it will find that no one is willing to step forward without permission** – which usually means defeat before the start.

Without optimism – the unshakable belief that things could be better than they are – the will to experiment will be continually frustrated until it withers. Optimism requires confidence, and confidence is built on trust. And trust, as we know, flows in both directions.

Building to think, or *the power of prototyping* (p. 87)

By the age of ten I had learned the power of prototyping based on years of intensive study. As a younger child I had spent hours using Legos and Meccano (known to Americans as Erector Sets) to create a world full of rocket ships, dinosaurs, and robots of every imaginable size and shape. Like every other kid, I was ***thinking with my hands, using physical props as a springboard for my imagination. This shift from physical to abstract and back again is one of the most fundamental processes by which we explore the universe, unlock our imaginations, and open our minds to new possibilities.***

Since openness to experimentation is the lifeblood of any creative organization, ***prototyping – the willingness to go ahead and try something by building it – is the best evidence of experimentation.*** We may think of a prototype as a finished model of a product about to be manufactured, but that definition should be carried much further back in the process. It needs to include studies that may appear rough and simple and encompass more than just physical objects. Furthermore, [this is an] essential component of design thinking. (p. 88)

Quick and dirty (p. 89)

Although it might seem as though frittering away valuable time on sketches and models and simulations will slow work down, ***prototyping generates results ‘faster.’*** This seems counterintuitive: surely it takes longer to *build* an idea than to *think* one? Perhaps, but only for those gifted few who are able to think the right idea the first time. ***Most problems worth worrying about are complex,*** and a series of early experiments is often the best way to decide among competing directions. ***The faster we make our ideas tangible, the sooner we will be able to evaluate them, refine them, and zero in on the best solution.***

Just as it can accelerate the pace of a project, prototyping allows the exploration of many ideas in parallel. ***Early prototypes should be fast, rough, and cheap.*** (p. 90)

Enough is enough (p. 91)

Prototypes should command only as much time, effort, and investment as is necessary to generate useful feedback and drive an idea forward. The greater the complexity and expense, the more “finished” it is likely to seem and the less likely its creators will be to profit from constructive feedback – or even to listen to it. The goal of prototyping is not to create a working model. ***It is to give form to an idea to learn about its strengths and weaknesses and to identify new directions for the next generation of more detailed, more refined prototypes.*** A prototype’s scope should be limited. “Just enough prototyping” means picking what we want to learn about and achieving just enough resolution to make that the focus.

Prototyping things you can’t pick up (p. 92)

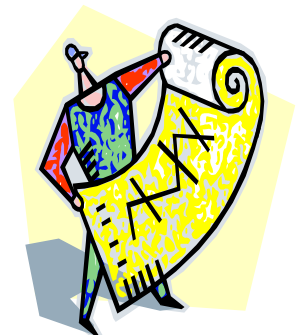
Anything tangible that lets us explore an idea, evaluate it, and push it forward is a prototype. In each case ***an idea has been given expression through an appropriate medium to show to others for feedback.***

The movie industry has long used this practice. The ***storyboard*** emerged as a way of mapping out the movie before it was shot to make sure that all the scenes were thought through...

Techniques borrowed from film and other creative industries suggest how we might prototype nonphysical experiences. These include ***scenarios***, a form of storytelling in which some potential future situation or state is described using words and pictures. (p. 93)

Another considerable value of scenarios is that they force us to keep people at the center of the idea, preventing us from getting lost in mechanical or aesthetic details. (p. 94)

A simple scenario structure useful in the development of new services is ***the “customer journey.”*** This structure charts the stages through which an imagined customer passes from the beginning of a service experience to the end. ...the value of describing a customer journey is that ***it clarifies where the customer and the service or brand interact.*** Every one of these “touchpoints” points to an opportunity to provide value to a firm’s intended customers – or to derail them for good. (p. 94)



Acting out (p. 95)

...***Our most reliable consultants...are kids***. As soon as two or three children get together, ***they start to role-play***: they become doctors and nurses, pirates, aliens, or Disney characters. Without prompting, they begin to perform lengthy enactments full of complex plots and subplots. Research suggests that this form of play is not only fun but also helps establish internal scripts by which we navigate as adults. (p. 96)

Learning to feel comfortable acting out potential ideas is obviously important for anyone contemplating an experiential approach to prototyping... Knowing some of the basics, such as how to build on the ideas of one's fellow actors and being willing to defer judgment to them, increases the likelihood that collaborative, real-time prototyping will be successful. The amateur theatrics of an experiential prototype can look foolish. It takes a certain confidence for individuals to loosen their ties, slip off their heels, and ***explore an idea through improvisation***. (p. 97)

Minding your own business (p. 100)

It is one thing to talk about prototyping material objects and even intangible services, but there is also a role ***for prototyping more abstract challenges***, such as the design of new business strategies, new business offerings, and new business organizations. Prototypes may ***bring an abstract idea to life in a way that a whole organization can understand and engage with***.

To create a compelling vision of the customer experience, the project team built prototypes and installed them ***in a walk-through experience***... This enabled senior executives to see firsthand how customers might interact... For technical and analytical grounding, they ***constructed a future road map [banner] that ran the entire length of a wall*** and displayed the elements of technology, business, and culture that the company would confront as the program moved forward. (p. 101)

Phase shift: prototyping an organization (p. 102)

Institutions must evolve with changing environments. Though the company “re-org” has become a cliché in business culture, it is nevertheless one of the most fateful and complex design problems any company may face, though it is rarely accompanied by any of the basic characteristics of good design thinking.

To be sure, ***prototyping new organizational structures is difficult***. By their nature, they are ***suspended in webs of interconnectedness***. No unit can be tinkered with without affecting other parts of the organization. Prototyping with peoples' lives is also a delicate proposition because there is, rightly, ***less tolerance for error***.

[In our experience with prototyping,] we learned that a story needs to be repeated many times before people understand how it applies to them and many more times again before they change their behaviour. ... ***When it comes to organizations, constant change is inevitable and everything is a prototype***. (p. 105)

There are many approaches to prototyping, but they share a single, paradoxical feature: They slow us down to speed us up.

The future of companies, economies, and Planet Earth (p. 192)

What all of these themes and examples have in common is ***direct engagement with people*** – whether they happen to be customers, clients, members of an audience, or solitary viewers of a Web site. The widespread shift, even among traditional manufacturing companies, from a “product” orientation to a “service” orientation is key to scaling up the tools of the design thinker ***to grapple with complex systems***... It is the very essence of open-source, social networking and Web 2.0.

If a task ever required the combination of analytic and synthetic practices, divergent and convergent thought, the designer's mastery of technology and insight into human behaviour, ***preserving the health of our planet*** would be it. Holding the economic sustainability of society and biological sustainability of the planet in balance requires the most “opposable” of minds. (p. 103)

...But we also have a Pandora's box of unanticipated problems that may have already contributed to long-term damage to our culture, our economy, and our environment.

Designers can't prevent people from doing what they want to with products they own, but that does not excuse them from ignoring the larger system. *Often, in our enthusiasm for solving the problems in front of us, we fail to see the problems that we create.* Designers, and people who aspire to think like designers, are in a position to make important decisions about what resources society uses and where they end up.

There are at least three significant areas where design thinking can promote what the Canadian designer Bruce Mau calls *the “massive change” that is called for today.* The first has to do with [1] informing ourselves about what is at stake and making visible the true costs of the choices we make. The second involves [2] a fundamental reassessment of the systems and processes we use to create new things. The third task to which design thinking must respond is [3] to find ways to encourage individuals to move toward more sustainable behaviours. (p. 194)

Altering our behaviours (p. 199)

We are in the midst of an epochal shift in the balance of power as economies evolve from a focus on manufactured products to one that favours services and experiences. Companies are ceding control and coming to see their customers not as “end users” but rather as participants in a two-way process. *What is emerging is nothing less than a new social contract.*

Every contract, however, has two parties. If people do not wish companies to treat them like passive consumers, they must *step up to the controls and assume their fair share of responsibility.* This means that we cannot sit back and wait for new choices to emerge from the inner sanctum of corporate marketing departments, R&D labs, and design studios. The implications are clear: *the public, too, must commit to the principles of design thinking...* (p. 201)

As the circle of design thinkers grows, we will see solutions evolving that will improve the character of the products and services we buy. Even on a large scale and even at the level of the most challenging problems we face in our society today, design thinking can provide guidance. *Left on its own, the vicious circle of design-manufacture-marketing-consumption will exhaust itself and Spaceship Earth will run out of fuel.* With the active participation of people at every level, we may just be able to extend this journey for a while longer. (p. 201)

