

# Design for the New World



Ida Engholm



# Design for the New World





# Design for the New World

From Human Design  
to Planet Design

Ida Engholm







To my parents

# Contents

Introduction:  
Being in the  
Making  
page 10

Chapter 1.  
A Journey of  
Consciousness.  
How Did We  
Get Here?  
page 42

Chapter 2.  
Wicked Problems.  
How Can We Handle  
the Trouble?  
page 74

Chapter 3.  
Zooming In and Out.  
What Is Our  
Perspective?  
page 116

Chapter 4.  
The Needs of  
the System.  
Who Is in Charge?  
page 148

Notes  
page 252

Illustrations  
page 256

Chapter 5.  
Creating Change.  
How Do We Get  
Started?  
page 164

Bibliography  
page 258

Index  
page 264

Chapter 6.  
DesignWISE.  
How Might We?  
page 222

Acknowledgement  
page 269

*The ultimate, hidden truth  
of the world is that it is  
something we make and  
could just as easily make  
differently.*

– David Wolf Graeber<sup>1</sup>



# Introduction: Being in the Making

Ever since humans began walking upright, we have intervened in our surroundings. We have shaped tools, formed the environment, and developed structures, systems and organizations of all dimensions and levels of abstraction. Historically speaking, one can see human activity as a gigantic design machine, producing still greater numbers of objects and human-made environments: from the millions of anonymous gadgets that fill our daily

lives to pathbreaking innovations – toothbrushes and shopping malls, smartphones and kitchen machines, space stations and the internet. But the design machine has also left an enormous footprint on the surface of the planet – a footprint that, according to the latest research, is greater than the impact of all other living things. Measured by mass, there is more plastic on Earth than all land animals and marine creatures combined, and human-made materials now outweigh the entire biomass of the planet.<sup>2</sup> If one were to make an asset list for humanity, it would no doubt include our capacity to imagine what our surroundings could be like and then realize this vision, either individually or together. It is this capacity that has given us everything from flint axes through settlement to spaceships and the strategies of multinational companies. But as a species, we have yet to fully grasp the consequences of

our actions, and it currently seems impossible for humanity to set a course towards a more sustainable life on Earth, despite our scientific insight into the noxious effects of our activities.

Before the spring of 2020, the idea of humanity uniting against a common threat was confined to the realm of Hollywood films like *The Day After Tomorrow*, *Deep Impact*, or *Independence Day*. But in 2021, we all experienced the COVID-19 crisis, which rivalled the most egregious Hollywood film both in scale and in the global response it engendered. Though some nations neglected the problem for far too long – and paid a steep price for doing so – the world as a whole showed itself to be remarkably capable of taking action when it needed to. One of the most significant aspects of the crisis is that, even in the earliest phases of the pandemic, despite the dearth of knowledge and evidence that was available at the time, there arose a more or less global acceptance of the virus's existence and the need for multilateral cooperation. It, therefore, seems fitting to ask: what if the global consensus with which we fought a disease that kills humans could also be used to fight the disease afflicting the planet?

The hope that underlies this book is that it is indeed possible to do so – if we want to, that is. But the environmental crisis will require many more shifts in perspective than the COVID-19 crisis. During the pandemic, we could set aside ‘business as usual’ because we knew that we would return to it relatively soon, but in the climate and environmental crisis, a return to normality is simply not an option. We, therefore, have to shift our mindset towards a very different kind of temporal horizon. For the same reason, we must turbocharge our imaginative faculty, as we will have to rely on that faculty to envision and bring about a whole new world. But, if we are ambitious enough, this new world will not only be sustainable – it will actually maybe be worth dreaming about.

In imagining how we might approach the environmental crisis, the COVID-19 crisis can be a source of inspiration. As we dealt with the virus, we had to handle the crisis both individually and together, using the powers of our imagination and our human agency. That agency often consisted of prototyping our way towards a solution, through a trial-and-error process for which we were often entirely unprepared. The hallmark of a prototyping approach is that one comes to understand the nature and scope of the problem to be solved *as one is solving it*. For COVID-19, this was the case on both the international level, as different countries tried out different types of testing and containment strategies, and, on the local level, as hospitals had to come up with new ways of housing patients, mass-processing PCR tests, and optimizing the flow of patients through the system. Taken together, the human response to the virus can be seen as one enormous exercise in design, where we were all, each in our own way, engaged in solving an array of problems related to the pandemic – by proposing, testing and revising solutions. This approach is the very definition of design: ‘What if I do this, what happens then? What if we try that, how does that affect the task?’

The key question that motivates this book is: What if we took the same design approach to the climate and environmental crisis? I would argue that, if we can create a similar kind of acceptance and consensus around the illness of the planet as we did around the human pandemic, we would also be able to use the methods and mindsets of design to resolve it. This is in part because I understand design as what humans do when we reshape our natural surroundings (for better or worse), and in part because design is fundamentally about imagining a world that does not yet exist. This is a skill we need more than ever. But before I begin to explore the applicability of design to the environmental crisis, let me explain what exactly I mean by ‘design’.

## The fifth dimension of design

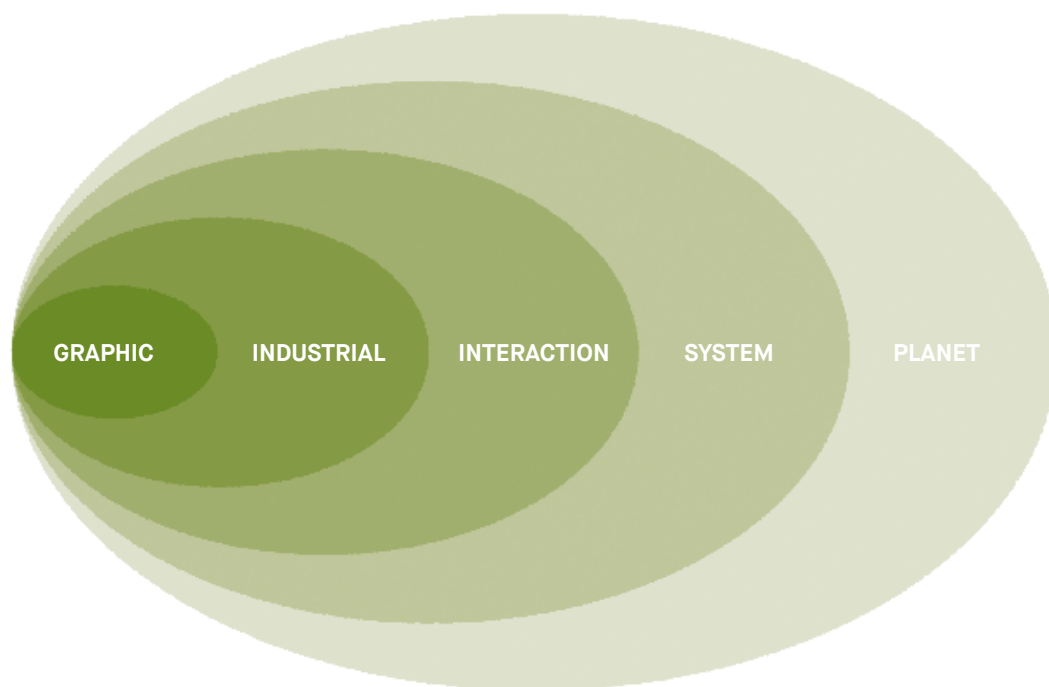
In the broadest sense of the word, *design* is about representing and bringing into being that which does not yet exist. Historically, the concept of design has been gradually expanded from referring mainly to the development of concrete products to encompassing a far greater variety of practices, such as the design of organizational structures or even entire societies. More specifically, one can speak of a *discipline-specific* and a *general understanding* of design.<sup>3</sup> In the discipline-specific understanding of the word, design is primarily linked to the modern industrial age, since it arose when a specific profession of craftsmen came to be employed to create concept designs and product prototypes for industrial mass production. This understanding of design centres on a materially or artistically based intention to create a given form, and it is mainly bound up with traditional design disciplines such as industrial design and graphic communication. However, in the *general* understanding of design, humans have always been designing, and design can be seen as the result of any human intervention in their natural surroundings. As such, all forms of tool use can be considered design. This book is focused on the general under-

standing of design, but I also argue that, when it comes to our ambitions to create a more sustainable future, we have much to learn from the approaches that have been developed in the professional discipline of design. My claim is that these approaches are useful not only for developing new commercial products, but also for exploring possibilities and generating solutions on large-scale organizational, social and political levels, in the form of visions, concrete strategies and political practices.

The premise behind this claim is that all humans are to some extent designers, in practice if not in name. The difference between professional and non-professional designers is merely the specialization, concepts, and tools developed by the design profession. But these professional practices would gain far greater social merit if they were more widely integrated into the everyday situations in which humans reshape their tools and surroundings, and so create the future world. By drawing inspiration from the methods and theories of design, we will become better at setting a course for all our creations – not just in industrial production, but in our journey towards a more sustainable future too.

In the popular conception, design has become synonymous with cups and teapots, the chrome casing of a toaster or the curling leg of a café chair. However, this limited notion of design is now largely antiquated, in both the general and the discipline-specific understanding of the concept. Over the past three decades, traditional design forms such as product design and graphic communication have been supplemented with more abstract forms such as service design, interaction design and experience design. To a still greater extent, design studies and practice have become a platform for innovation and strategic business development, and in emerging fields such as speculative design, design futuring and transition design, design is seen as a tool for large-scale transformation on a societal level.

Design theorist Richard Buchanan has coined the term ‘the four orders of design’ to describe the development of design: Over time, new layers of meaning have been added to the understanding of design, supplementing but not replacing the previous ones. The four orders listed by Buchanan are (1) design of visual representations, such as graphic communication, (2) design of new products, such as industrial produced product design, (3) design of systems and services and (4) design as a tool for organizational, political, financial or social development.<sup>4</sup> Here, I follow Buchanan’s broad-based definition of design, but given the book’s focus on environmental and climate concerns, I propose to add a fifth-order, as a fifth dimension, where design is an approach for handling the hyper complexity of challenges at a planet-level. This new dimension of design relates to ecosystems on a global scale, and as such it obviously includes the four previous orders as well. But this fifth dimension of design also draws attention to the fact that in the Anthropocene age (a concept to which I return) we cannot consider any human activity independently of the ecosystem in which it unfolds. We must therefore continuously, in all our actions and imaginings, remain focused on our impact on the planet and our individual and collective responsibilities for the global environment.



Signs  
Symbols  
Print

Products

Services  
Experiences  
Interfaces  
Information

Business  
Organization  
Education  
Government

All  
ecosystems

Design theorist Richard Buchanan coined the term ‘the four orders of design’ to describe the development of the field from graphic communication through industrial design and the design of services and interactions to new forms of organizational and systemic design. But if we are to address the global challenges we currently face, we will need a fifth order of design for the planet. And this new dimension requires that we take all artefacts and systems that make up the human world into consideration

as we plan a more sustainable future with awareness of the consequences for the global ecosystem that are the very prerequisite for the existence of life on this planet. The entities to be considered include both tangible objects that we can influence directly – such as the materials and technologies we choose for our products – and abstract systems that seem to have their own life, and which we often experience only in piecemeal form, such as the systemic structures that have led to global warming.



# DESIGN DESIGN

In this book, I take design to be a fundamental component of all human activity. When design is broadly conceived in this fashion, it can help us to integrate the remarkable wealth of specialised knowledge and skills that humans have developed over the centuries into an interconnected whole. But to do so, we must become aware of the intentions that guide our design,

including the values, worldview, and aspirations behind design. Further, we must look at how we can use the methods and mindsets that characterised the professional field of design to foster cooperation among disciplines, in an integrative and interdisciplinary approach. After all, we have many professional fields and faculties in the world, but only one Earth.

## DESIGN THINKING DESIGN DOING

Design thinking and design doing are inherently interlinked aspects of design. It is the particular, productive interaction between thinking and doing that is the hallmark of a design approach to a challenge or problem, even as it may involve many other professional perspectives and disciplinary backgrounds. Traditional design genres (what Buchanan terms orders 1 and 2) have often been

practiced by professional designers, while newer design genres (orders 3 and 4) often entail large-scale interdisciplinary projects, in which trained designers are involved as just one professional group among many. At its most extreme, planetary design (order 5) should involve all human beings in a collective design practice that aims to restore all ecosystems to a sustainable balance.

One characteristic aspect of design is its propensity to combine insights from many different disciplines, thus bridging scientific, technical, artistic and mercantile approaches to a problem. Buchanan refers to the interdisciplinary nature of design studies as its *integrative function*.<sup>5</sup> In essence, design has a unique ability to coordinate, combine and condense knowledge from many fields into a singular solution. The integrative function of design can be illustrated by small-scale challenges, such as the choice of a given product's material and manufacture, where a design approach will serve to coordinate and integrate any number of requirement specs and thereby present a single solution. The same integrative function also applies to large-scale questions, as in the development of new systems, organizational guidelines or political visions. Here, a design approach can coordinate input from a number of different experts and stakeholders, leading to a material or immaterial concretization of the various considerations. In connection with such strategic and large-scale processes, the term *design thinking* is often used to describe the idea-generating and proposal-making approach. The outcome is not necessarily a product or a visual form but can also be a strategy, a vision or a policy. Design thinking is a broad and diverse research – and practise field, but in this book, I treat design thinking as an integral part of any design activity.<sup>6</sup> My argument is that regardless of its object, design thinking is not only about conceiving ideas but also about immersing oneself in a given action. As such, I consider design thinking as a form of *thinking through making*, in which materials and practitioners continually respond to one another in the ongoing generation of new concepts and forms. Throughout the book, my use of the words design and design thinking all carry the crucial premise that *thinking and doing are inherently interconnected aspects of any given design activity*.

Both professional designers and people from other backgrounds can work with design thinking. The difference between them is that when professional designers engage in design thinking, they will usually not only be focused on the conceptual or strategic content but also on the quality of the visual and tactile form to which the process will lead. Design practitioners without professional training tend to use design thinking more broadly, as a prototyping approach to a given problem: proposing, testing and adjusting solutions to reach the intended goal. Here, the visual and tactile elements can have all sorts of different materials and shapes, and the goal is not necessarily a high quality of expression and form (that can come later), but that the solution is given a concrete shape. In these contexts, design thinking is more generally about releasing the creative potential that all human beings possess.

Given that I subscribe to a general understanding of design, the book is centred on forms of design practice and design thinking that can potentially be carried out by anybody. But I do maintain that professional designers will always be an ideal partner in design and development processes, especially if the outcome is to have a visual or tactile element of high aesthetic quality or a comprehensive upscaling. More generally, I argue that, while anyone can engage in any order of design, all designers – professional and otherwise – must begin to shift their focus towards sustainable goals, which will entail an awareness of the planetary level of design. If we are to achieve the sustainable transition that we so desperately need, we must conceive of design less as a tool for industrial production, economic growth and increased consumption, and more as a uniquely effective way of shouldering our collective responsibility as human beings.

Because design is about creating that which does not yet exist, anyone who engages in design thinking – again, whether professionally or otherwise – has the possibil-

ity of responsibly partaking in the shaping of our future world. As such, my claim follows in the footsteps of the pioneering design activist Victor Papanek, who in *Design for the Real World* argued that:

All men are designers. All that we do, almost all the time, is design, for design is basic to all human activity. The planning and patterning of any act toward a desired foreseeable end constitutes the design process. Any attempt to separate design, to make is a thing-by-itself, works counter to the fact that design is the primary underlying matrix of life.<sup>7</sup>

Many of us have yet to take this crucial insight into account when contemplating the state of the world, but in the face of the current environmental disaster, it has become more important than ever. The world that surrounds us is one we have shaped, and if we want to, we can design it differently.



## Design in the Anthropocene

A bird's-eye historical perspective on the development of humankind would show, on the one hand, a long journey towards still greater mastery of our surrounding environment. As noted previously, we have designed and refined our habitats, objects and tools (both material and immaterial) and as a species, we have achieved great progress and welfare – notwithstanding the ever-increasing global inequality. But on the other hand, since the Industrial Revolution, humans have gone from designing things that could satisfy their needs to designing new needs. Over the past two centuries, Western culture has turned into what I referred to earlier as a gigantic *design machine*, which creates and caters to an ever-widening spiral of needs – needs that can therefore never be sated, but which are constantly deflected, redoubled and circulated in new formats, versions and dimensions. This design machine is fueled by the infinity of the human imagination, which is always churning and so consuming vast streams of finite resources, producing everything from new kitchen devices and summer shorts to space stations and social media posts. It is a machine that births its own purpose in an apparently unstoppable circular movement, like one gigantic and all-destructive wheel spin. This spin has already left traces in the earth's crust so deep that scientists speak of a new geological era: the *Anthropocene*, meaning the collective impact of human activities on Earth.

The concept was first introduced in the 1980s by the ecologist Eugene Stoermer and rose to prominence in the early 2000s when chemist and Nobel Prize winner Paul Crutzen argued that it should be inscribed as a new geological era in the history of the Earth, the era in which human activity has become a geological force on equal footing with volcanic eruptions, meteoric impacts, and the movement of tectonic plates.<sup>8</sup> Crutzen and others argue that the Anthropocene began with the Industrial Revolution and the resultant surge in fossil fuel consumption around 1800, linking it to the rise of

the modern industrial production machine.<sup>9</sup> By contrast, geologists Simon Lewis and Mark Maslin claim that the beginning of the Anthropocene can be traced all the way back to when members of the *Homo Sapiens* species first began intervening in their surroundings by using fire and harvesting crops, thus becoming, as they put it, ‘a geologic superpower, setting Earth on a new path in its long development’.<sup>10</sup>

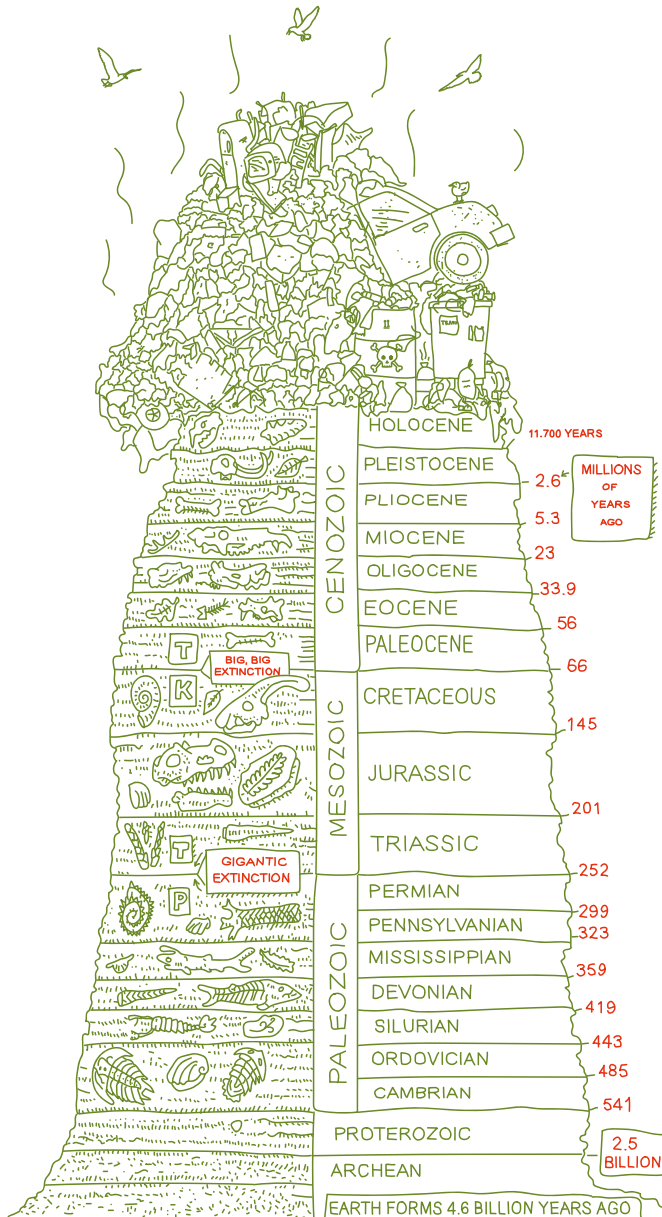
Along the same lines, philosopher Timothy Morton connects the Anthropocene with the human domestication of plants and animals, which in his view also led to the creation of a patriarchal and hierarchical ‘possibility space’.<sup>11</sup> Domestication not only set in motion the human hegemony over the surrounding environment that is now unfolding in all its raging absurdity; according to Morton, this was also the moment when the binary conception of the world was born, a fundamental distinction between humans and nature, whose consequence, according to Morton, is that humans are now completely alienated from a world in which we are also – whatever we may like to think – deeply entangled. Against the thesis that the Anthropocene began with domestication, one can argue that for thousands of years humans lived as farmers in harmony with nature. Indigenous people, for example, the Iroquois were farmers, the Hopi tribes were farmers and many other tribes in North and South America and Old European culture based their farming on cyclical understandings of their relationship with nature. However, there is no doubt that the binary understanding of man vs. nature is gradually gaining ground with the agrarian society to further gaining strength with the scientific and later with the industrial revolution. Whatever understandings we subscribe to, the various theses force us to reflect on the current challenges we are faced within a species perspective.

As climate philosopher Jedidiah Purdy argues the debates about the definition and delimitation of the Anthropocene can serve as an occasion to reflect on our-

selves as a species, and on our place in relation to the globe. According to Purdy, the question of what it means to be human must be at the centre of all these discussions, as the concept of the Anthropocene only has explanatory power insofar as we know what the *anthropo-* ('human') signifies. Debates about the Anthropocene should avoid treating the human as an abstract or ahistorical entity living outside the world and must instead insist on humanity's deep imbrication with the globe – meaning that everything we do has a consequence beyond ourselves. Humanity's sphere of influence is vast, as is the ethical responsibility that comes with this influence. Our effects on the world encompass not only what we have created (tools, cities, infrastructures and satellites), but also what we have failed to build and what we have spared from destruction. As Purdy puts it: 'Nature no longer exists apart from humanity. The world we will inhabit is the one we have made.'<sup>12</sup>

In sum, the concept of the Anthropocene offers a space for discussion and storytelling that allows for multiple perspectives to come together in a common cause: the resolution of the global environmental crisis in which we find ourselves. The concept currently serves as a flashpoint we can use to discuss the damage wrought by humanity's megalomaniac thrashing through the world. But I believe that it can *also* be a point of departure for our future-facing work, since it highlights the unavoidable fact that, for better or worse, humans are capable of shaping their future. Today, we must learn to do so consciously and with greater respect for our planet. Design has been a part of the problem – in its contributions to a seemingly unstoppable industrial production machine – but for that very reason it can also be part of the solution. However, this new concept of design requires a reassessment of some fundamental assumptions that lay behind early design studies, which introduced the aforementioned 'general understanding of design' as a way to describe all actions by which humans interfere in our surroundings.





There are different ideas about when the Anthropocene begins: when we became agrarian and started ‘designing’ nature by cultivating the land and domesticating animals instead of hunting and gathering? Or when industrialism gathered momentum and we started burning fossil fuels? Some claim that the Anthropocene begins with development of nuclear weapons and humanity’s capacity

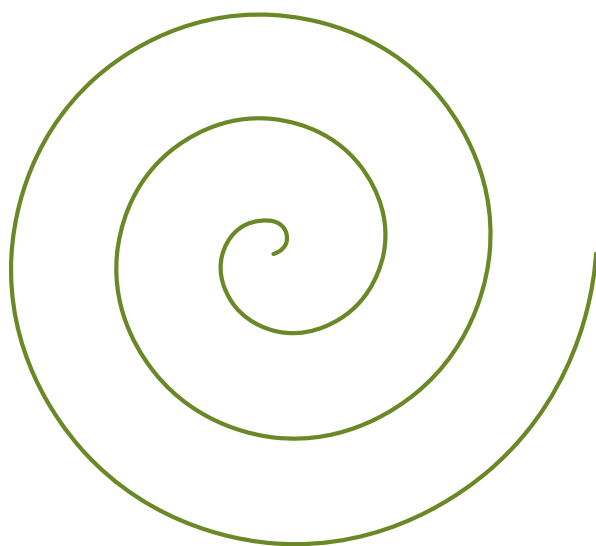
to destroy the planet. Watching the first nuclear bomb test in 1945, Julius Robert Oppenheimer quoted the Hindu scripture, Bhagavad Gita, saying ‘Now I am become Death, the destroyer of Worlds’. Some even talk of an even newer geological age, the Capitalocene, focussing on capitalism, the idea of eternal growth and Western lifestyle as the real problem.



In his pathbreaking book *The Sciences of the Artificial* from 1969, economist and Nobel Prize-winning social scientist Herbert Simon described design as a practice that is ‘aimed at changing existing situations into preferred ones’.<sup>13</sup> Crucially, this was an activity that all sorts of professions and disciplines could engage in. For Simon, the concept of design denoted all conscious activities that create new artefacts in modern society, and his research was itself an example of the breadth of investigation that the complexity of modern society invites. His studies spanned from artificial intelligence through management studies to psychology, sociology and economics, as well as theories of problem-solving, decision-making and complexity. Simon not only set a normative goal for what design should be – ‘changing existing situations into preferred ones’ – but also exemplified an interdisciplinary practice that revolved around the creation of an ‘artificial’ or human-made world. In short, Simon’s ‘sciences of the artificial’ constituted the study of how design could bring about a world shaped by human activity. For Simon, design was fundamentally about exploring the possibilities, and it was thus primarily focused on what the world *could* or *should* be – as opposed to the natural sciences, which according to Simon are only interested in analyzing the world *as it is*.<sup>14</sup> Simon’s ambition to develop a science of the possible thus relied on a conflictual tension between the present – what is – and the future – what could or should be. The goal was to supplant the former with the latter in the best possible way. Simon’s project was explicitly normative, and it was powered by expectations that flourished at the time that systems theory and the emergent field of computer research would deliver a better world for humankind.

However, faced with the enormous ecological challenges that now confront us, I argue that this notion of design must be rethought. If we are to live up to the spirit of Simon’s ambition to change existing situations into preferred ones, we must start by considering where our preferences derive from. The argument behind this book is

that this question requires a new conception of design as a practice that is not only aimed at transforming existing situations into preferred ones, but rather transforming existing preferences into a preferred existence. But defining preferred existence is not an exact science: there will probably be as many definitions as there are conscious entities on the planet. What I am suggesting is that, instead of focusing exclusively on how products and outcomes of design can serve our existence, we must begin to ask critical questions about the fundamental worldview, values and beliefs that lie beneath our design: that is, we must practice *meta-design*. What is the basic motivation for our design practices? What is the intention behind our design decisions? What is the driving force in our design processes? These basic assumptions reflect our internal priorities and experiences, which then spirals outwards and downwards into our surroundings.



## From existing preferences to preferred existence

In this book, I argue that across disciplines and professions, the mindset and methods of design offer ways of refining that special skill that humans share: we are the only species on Earth that is capable of imagining a future and working together to bring it about – thus shaping our own world. Design is in itself a diverse field, which includes many kinds of practices and processes. This may well be the case for all fields: as the philosopher Ludwig Wittgenstein has argued, all forms of practice are constituted by a shared set of assumptions that inform a given way of doing.<sup>15</sup> In the practice of traditional and craft-based design, these assumptions often pertain to the relation between medium and function, material and mastery, and so on. Likewise, the practices that makeup established design genres such as product, graphic or fashion design all have their own assumptions, conventions and histories.<sup>16</sup> In a broader understanding of design – which is what I subscribe to in this book – the basic assumptions and processes that define the field are about how we can collectively explore, test or play with possibilities and solutions to social and environmental challenges, on many scales and at many levels. Design will always entail a multifaceted trial-and-error process of prototyping and insight. What is the preferred situation that we are pursuing? What if we reframed the problem? How might we approach this situation differently? Can we create a new kind of consensus around this topic, moving from existing preferences to preferred existences.

This book is an attempt to consider and examine the intersection of the two trends outlined previously: on the one hand, the expansion of the concept of design from the level of concrete objects to the level of abstract systems and even biospheres and, on the other hand, the expansion of human responsibility during the Anthropocene. However, in order to combine these two trends and harness the power of design in the service of sustainable transformation, my argument is that we need to cultivate a new attitude towards design. An attitude that requires us to take a step back and examine the intentions driving our creative activities. If we apply a planetary perspective to our actions, do we have any idea where humanity is headed? My point is that this can be hard to determine while we are entangled in the day-to-day challenges in a practice where our actions typically have a fairly short timeframe and a focus on the near context at a personal, organizational or national level. However, contemplating the planet from the outside provides a different perspective on our being in the world. Seen from the outside, the planet has a simple and finite character. Here, we focus on what *is* – Planet Earth and its current state. My purpose in this book is to outline a number of different paths to the incorporation of a planetary perspective in our design decisions. In that regard, my primary aim is to examine how traditional design methods can be supplemented with alternating states of zooming in on the detailed levels of analysis, exploration and proposal-making that we typically work within design process and zooming out to the planetary level. In the context of the book, this also involves alternating between what I call ‘a state of doing’ and ‘a state of being’. It is my central claim that through an increased focus on our condition of *being*, we can take a step away from our everyday processes and learn to reconnect with the larger planetary whole; the global whole that we have forgotten in the

processes that typically drive design today, which serve to feed the seemingly unstoppable production machine in its continuous stream of newly minted needs. These needs can easily be met if we consider them from a short-term perspective. However, the price we pay is a lack of engagement with who we actually are and what on earth we are doing. If we struggle to handle and address the current climate changes and environmental threats, that might be because we have to be the change the planet needs. Hence, in this book, I am interested in the ways in which our worldviews and values shape the mindset determining the design of our shared future. One way to approach this question is to examine the tools we might use to shift our thinking towards a more holistic, planetary perspective through the above-mentioned condition of *being*, including practices such as *mindfulness* and *presencing*. How might these tools be applied in the context of organization, leadership and development? For example, might it be possible to combine traditional design thinking, with its often goal-oriented and rationalist perspectives, with the much more diffuse perspectives that characterize the condition of being? How might we design differently if, in the moment of making, we also experience ourselves as part of a much larger system within which our activities unfold?



Being in the making. The central point of the book is that if we are to achieve a long-lasting transformation of our world, we need to increase our focus on a new condition of being to supplement the goal-oriented conditions of thinking and doing that have traditionally characterized design and development as well as

our self-perception. Further, I distinguish between a focus on how we are beings in the making and how we can become present while we are making. My main claim is that, ideally, our thinking and doing must be balanced with being. After all, we are human beings, not human doings.

In its presentation form, the book may be seen as a *designerly* way of outlining a proposal for a new foundation of design. I boldly proclaim the book to be a ‘manifesto for a new faith’, because my purpose is rooted in a conviction that if we fundamentally reframe the underlying premises of design, we have the means to create a new world.

To do this, we will have to mobilize forces across disciplines and fields of expertise, developing alternatives to the narrow silos of academia. Design can help us create these new ways of working with knowledge and dissemination, since it works with the integration of different perspectives, and materials into new solutions or ways of framing the problem. Design can inspire us to develop a lingua franca, allowing us to share our perspectives on the challenges we face. When I use the notion of the ‘designerly’, I mean by it the integrative way in which knowledge from countless disciplines are combined into a design, that is, a concrete solution or proposal.<sup>17</sup> I also use this word to refer to the abductive methods of designers and design thinkers: the playing with guesses and what-if’s when approaching a given problem. In this context, design can be understood as a set of proposals for ways of thinking, or possible prisms through which to ponder the challenges we face. The research protocol behind this book will therefore not be presented as a linear review of the state of the art but as a series of explorations and suggestions for possible correlations between different research positions and practice fields. The research and practice protocol are primarily those of design studies, but I also draw on perspectives from evolution theory, developmental psychology, systemic leadership theory and native wisdom traditions, whose different perspectives contribute to the creation of what I am proposing as a new foundation for design and design thinking. This designerly way of moving across disciplines is of course open to criticism. As I draw on different perspectives and create analogies, I will not dwell extensively on the precise meaning of each concept in

their original context. My hope is that the models I propose and the perspectives I integrate across disciplines will usher in a debate about the role of design in shaping a sustainable future. In this sense, the book is a personal manifesto, based on a life with design and design thinking, in my academic as well as my professional practice. I situate myself in the ongoing discussions within design theory about the nature and origins of design: What is design? Who is a designer? What are the results and purposes of design? In trying to mobilize a broader engagement with the practice design, I also lean on recent developments in practice-based design research, which have shifted our notion of design as a discipline aimed at designing objects, interactions, and experiences, to a more cross-disciplinary and collaborative practice aimed at designing systems and organizations. At the same time, design is also moving from being a discipline focused on designing *for* people to a discipline focused on designing *with* people and *by* people.<sup>18</sup> The aim of this book is to promote a broader engagement with *design*, with design *by* people and with design *for the planet*.

The book consists of six chapters, which may be read as six proposals for approaches, prototypes, conceptual models and specific tools for addressing urgent challenges.

In Chapter 1, ‘A Journey of Consciousness. How did we get here?’, I apply a perspective informed by evolution and developmental psychology to the development that humanity has undergone from when we first began to walk upright to the hypercomplex world we live in today. The conceptual model that frames the chapter is a schematic illustration of ‘spiral dynamics’ of consciousness development and ‘value memes’. The question I seek to address by introducing this model is how our consciousness, including our values and worldviews, have shaped the ways in which we organize our societies and give form to our interventions in the natural environment before, up to and during the present phase of human-made climate change. With this historical retrospective, I seek



to lay the groundwork for discussing broader questions about humanity as a single entity that is distributed over the surface of the planet, addressing this topic from both within and without and critically considering how we can become more aware of our relationship with the greater whole that we are a part of.

In Chapter 2, ‘Wicked Problems. How Can We Handle the Trouble?’ I turn my eye to the future and address how we can approach the complex problems we are facing, described as ‘wicked problems’. These challenges are metaphorically depicted as a giant doodle that may seem impossible to make head or tail of. My argument is that approaches from design and design thinking can help us ‘get on top’ of wicked problems and begin to sort them out and find new paths to take us through the complexity. This is because design offers approaches that make it easier to remain in spaces of ambiguity, uncertainty and hyper-complexity – described in the book as committing ourselves to and staying with the trouble – while also exploring possibilities and proposals for solutions.

In Chapter 3, ‘Zooming In and Out. What is our perspective?’ I further develop the design perspective introduced in Chapter 2 by presenting new ways of reframing complex challenges through what I present as a conceptual model that includes both a *vertical perspective* (shifting the spatial scale on which we view the problem) and a *horizontal perspective* (shifting the problem into a time-frame). My argument is that in order to work in a field of complex challenges, we need to be able to shift back and forth between a zoomed-out and a zoomed-in perspective along both these axes. I further argue that this shifting back and forth also calls for a shift in mindset that enables us to move between the states of doing and being.

In Chapter 4, ‘The Needs of the System. Who Is in Charge?’, I turn from the design processes themselves to look at the underlying motivations, desires, and needs – that is, the meta-design – that shape our design decisions.

I revisit the famous ‘hierarchy of needs’ formulated by Abraham Maslow to propose a revised or ‘hacked’ version of the pyramid, to encourage a fundamental discussion of which needs are driving our decisions today, and how those needs might be made more sustainable.

In Chapter 5, ‘Creating Change. How Do We Get Started?’, I use system leadership theory to challenge systems with built-in resistance to sustainable transformation. In continuation of these perspectives, I present a number of approaches for how we can carry out far-reaching transformations of organizations and societies at a concrete, tool-oriented level. As part of these suggestions, I investigate how approaches from design thinking and systemic leadership can contribute to critical reflections on new collective and co-creative visions of the future.

In Chapter 6, ‘DesignWISE. How Might We?’ I move from design theory and systemic leadership theory to another area of investigation, pursuing alternative approaches to sustainable design development. In the chapter, I develop the suggestions presented in Chapter 5 into a specific process tool inspired by indigenous wisdom traditions, thus pursuing the book’s aim of combining rationalist goal-oriented approaches with presencing-oriented conditions of being. DesignWISE is a practical tool for facilitating design and development processes, and its goal is to make its practitioners reflect on themselves and their future, based on the premise that our capacity for imagination – as reflected in our actions and creative practices – is both our greatest asset and our most dangerous weakness. For that reason, imagination must be used with care and consideration.

The chapters may be read in sequence or independently. The first part of the book, Chapters 1–4, is mainly focused on theories and principles pertaining to the nature of sustainable change, and the second part, Chapters 5 and 6, is mainly focused on practical directions, tools and cases. After Chapters 1–4, I present a chart of brief reflection

points to guide contemplation on and discussions about the themes of the chapters. After Chapter 5, I sum up the main arguments of the book in an illustrated chart with an overview of the most important perspectives and suggestions. In Chapter 6, the practice tools for facilitating processes of change are supplemented with additional questions for reflection and further development.



Early concerns about limited resources and the impact of our material production on the environment are often traced back to the teachings of Buckminster Fuller. His *Operations Manual for Spaceship Earth* and the first Whole Earth catalogues played a key role in popularizing ecology and promoting the idea of ‘whole systems’ thinking

in design and design thinking. Above is an illustration of Fuller’s *World Town Plan* from 1927, which included an early critique of the consequences of unsustainable world planning: ‘United we stand, divided we fall’ is correct mentally and spiritually but fallacious physically or materially. 2,000,000,000 new homes will be required in next 80 years.<sup>19</sup>

**Design** must be an innovative, highly creative, cross-disciplinary tool responsive to the **needs of men**. It must be more research-oriented, and we must stop defiling **the earth itself** with poorly designed objects and structures.<sup>20</sup>

The quote is from Victor Papanek, the earlier mentioned pioneer of sustainable design, who strove for decades to establish a more responsible foundation for design. His agenda-setting book *Design for the Real World* from 1971 was translated into 20 languages and inspired the eco-awareness that gained a footing in the design profession during the 1970s. In the book Papanek aimed to highlight how design is both responsible for and has the opportunity to solve problems such as ‘pollution, overcrowding, starvation, obsolescence and other modern ills’ and, as he adds, ‘thereby leading us away from fetish objects for a wasteful society’ towards what he called ‘a new age of morally and environmentally responsible design’. Another and equally important

proclaimed purpose of the book, besides convincing designers, was to engage everyone in a more sustainable future. Given Papanek’s ambitions and influence and the many related activities, exhibitions and proposals that came out of the sustainability movement at the time, it may seem disappointing that we have not made more progress by now. This book is an attempt at picking up the baton from Papanek and calling for designers, other professions and, indeed, everyone to use design as a tool for plotting a new course for the world and to begin to prototype what it might be like to live in it. I join Papanek in calling for a new sense of responsibility in design and for a broad commitment that includes co-creative cross-disciplinary efforts and initiatives.

*Sustainable development is defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs.* <sup>21</sup>

This definition, from the World Commission on Environment and Development's 1987 Brundtland report, still aptly describes the ideal that we should be striving for today. However, we should keep in mind that we and future generations should always satisfy our needs in ways that are balanced with all ecosystems and the biosphere, thus creating a space in which all living organisms can thrive.

Throughout the book, I use 'sustainability' to describe the goal we should be striving for in our social and economic development, but crucially, sustainability is not a fixed entity but an emergent ideal. Even as we do our best to move toward this ideal, we must continuously explore and debate what it might mean.

Thus, I deliberately do not offer a list of specific focal points but speak more broadly about social, environmental and climate sustainability. Sometimes I use terms such as 'regenerative design' or 'ecological design', which I define as variants of sustainable design. Some designers have called for replacing the term 'sustainable design' with 'regenerative design', arguing that the former has negative connotations because it has not succeeded in achieving the expected changes since the 1980s when it gained wider use. In my opinion, the answer is not to re-label our efforts. What is needed is a fundamental shift in our thinking about design, including the intentions and values that drive our design engagement. These underlying intentions are the focus of this book, based on the notion that what is inside us is also what we see reflected around us.



*The foundation for ecological enlightenment is the 3.8 billion years of evolution. The story of evolution is a record of design strategies as life in all of its variety evolved in a vast efflorescence of biological creativity. The great conceit of the industrial world is the belief that we are exempt from the laws that govern the rest of creation. Nature in that view is something to be overcome and subordinated. Designing with nature, on the other hand, disciplines human intentions with the growing knowledge of how the world works as a physical system. The goal is not total mastery but harmony that causes no ugliness, human or ecological, somewhere else or at some later time. And it is not just about making things, but rather remaking the human presence in the world in a way that honors life and protects human dignity.*

– David Orr<sup>22</sup>



# Chapter 1. A Journey of Conscious- ness. How Did We Get Here?

In the general understanding of the term (as described in the introduction), design can be traced back to humanity's earliest interactions with our natural surroundings. We have designed for as long as we have been human: shaping tools, intervening in our environment and developing structures, systems and organizations. The history of our interaction with our surroundings can be traced back even beyond the emergence of fully modern humans – *Homo sapiens* – to our hominid ancestors. According to geologists Will Steffen and Paul Crutzen et al., for millions of years, humans and their ancestors influenced their environment in many ways, but always by way of modification of natural ecosystems to gain advantage in gathering the vegetative food sources they required or in aiding the hunt for the animals they hunted.<sup>23</sup>

This changed around five million years ago, when *Homo erectus* be-

gan to develop stone tools and rudimentary weapons and learned to control and manipulate fire, which Steffen, Crutzen et al. describe as 'a crucial breakthrough that fundamentally altered our relationship with other animals on the planet, none of whom could manipulate fire'.<sup>24</sup> The control of fire helped hominids to hunt and cook meat, and the increase in this protein-heavy food source seems to have triggered a fundamental shift in the physiological and mental capabilities of early humans. Their brain size tripled, growing to approximately 1300 cm<sup>3</sup> and giving humans the largest brain-to-body ratio of any animal on Earth.<sup>25</sup> The physical remains of early human species show that *Homo erectus* and *Homo neanderthalensis* began to use fire on a regular basis c. 300,000 years ago, and presumably passed this skill on to *Homo sapiens* when the species emerged some 200,000 years ago.<sup>26</sup>

The early humans' ability to control fire and shape tools developed slowly over hundreds of thousands of years. The oldest known handaxes, for example, can be dated to 1.7–1.6 millions of years ago, but the shape of those axes stayed more or less constant over the next one million years. Anthropologist Tim Ingold argues that the early human's ability to develop tools reflects their ability to form preexisting mental images of what they wanted to create – what we would call *concepts*, mental representations of something that does not yet exist and which serves to bring it into being.<sup>27</sup> Ingold discusses why handaxes continued to have roughly the same shape for a million of years: if early humans were capable of imagining a form, why could they not design a different one?<sup>28</sup> Perhaps the inertia of design was due to the material itself, namely the natural properties of flint, or perhaps it had to do with the species' physiological capabilities, skills or anatomy, or perhaps the form should be understood as the product of instinct, not intention.<sup>29</sup> Either way, it would seem that the flint handaxe represents the limits of imagination for these hominoid species.

But with the arrival of *Homo sapiens*, the relation between matter and form began to develop and expand in all sorts of innovative ways. In *Sapiens*, historian Yuvel Harari describes how, between 70,000 and 30,000 years ago, humans began to invent a variety of tools, such as boats and bows, and gave them different shapes and expressions at different times and places, in an on-going dialogue among imagination, matter and form. This expansion of forms marks the beginning of the human journey of planning and making, leading to what I described in the introduction as the Anthropocene design machine. In the beginning, this machine moved at a slow pace indeed, through a trial-and-error exploration of what resources were available and how one could work within their constraints and possibilities. Slowly but surely, this exploration set humanity on a path from which there was no going back.

One way of describing this development is to focus on the *outcome* of human interventions and design – from the earliest stone tools to the modern man-made landscape of artefacts and social systems. But as noted in the introduction, the aim of this book is to explore, not the physical manifestations of our design activities, but those values and worldviews that lie behind every act of design, the intentions and processes that precede the coming-into-being of any designed objects. I would suggest that an Anthropocene perspective invites us to explore how human worldviews have shaped the history of design before, up to and during the explosive rise of human-made climate change, so as to better understand humanity's possible futures: given our long history, what are the most likely projections of our future behaviour? That is the point of departure for this chapter, which will present a historical overview of design to establish a new framework for discussing our potential planetary futures.

My investigation will not engage primarily with the field of design history, but rather with developmental psychology and the study of the stages of human consciousness, including the values and worldviews that have been predominant at different given points in human history. I draw especially on the design theorists Daniel Christian Wahl and Seaton Baxtor's application of developmental psychology to design studies, as well as the psychologist Clare Graves's theory about the evolution of human consciousness and its elaboration by the philosopher Ken Wilber and the management theorists Don Beck and Chris Cowan. Finally, I bring in perspectives from management thinker Frederic Laloux's engagement with Graves, Wilber, Beck and Cowan in his discussions of the historical preconditions that will shape the organizations of the future.

Given my particular interest in the intentions and values that shape our design, I base my discussion on Wahl and Baxtor's argument that designing for sustainability not only requires rethinking our habits, lifestyles and everyday practices but also our *relation* to design. They further

argue that sustainability is essentially a process of co-evolution and co-design, which will necessarily involve a number of different communities in order to make flexible, adaptable design decisions on the local, regional and global scale. As they put it, ‘the transition towards sustainability is about co-creating a human civilisation that flourishes within the ecological limits of the planetary life support system’.<sup>30</sup> According to Wahl and Baxtor’s definition, design can be seen broadly as the expression of intentionality through interactions and relationships. At the ‘downstream’ end of this process of expression are our cultural artefacts, institutions, patterns of production and consumption, all of which give a material form to human intention. At the ‘upstream’ end of the design process is its immaterial dimension: the meta-design of our awareness, value systems, worldviews and aspirations which define the intentions that in turn shape the final design. The term meta-design here refers to the concepts and onto-epistemological assumptions that we use to define ourselves and to make sense of our experiences as we engage in complex ecological, cultural and social processes.<sup>31</sup> According to Wahl and Baxtor, it is important to becoming aware of the assumptions that have guided our design decisions in the past, so we can achieve a better understanding of what went prior, and so make better decisions in the future by pursuing what they call a more holistic and inclusive perspective on design and design thinking.<sup>32</sup>

Wahl and Baxtor present a schematic overview of the development of human consciousness, building on Clare Graves’s mapping of the various stages of the human consciousness. According to Graves’s theory – which was based on many years of psychological research into human forms of living, doing and decision-making in complex social settings – human consciousness has historically evolved through a series of levels, by a process that Graves terms *spiral dynamics*. The schematic presentation given by Wahl and Baxtor also draws on Wilber’s meta-study, which compared Graves’s levels with studies of human development from other fields, such as anthro-

pology and neuroscience. Further, the overview builds on Beck and Cowan's work, in which they clarified and developed Graves's insight in a leadership context, and further tested the theory of developmental levels through large-scale quantitative studies, interviewing thousands of people across countries, cultures, organizations and so on.<sup>33</sup>

The figures on page 53–62 describes eight levels of development, which Graves calls *biopsychosocial systems*, assigning a colour to each of them. The levels were renamed 'vMEMES' by Beck and Cowan, short for 'value memes'. This concept is taken from the psychologist Mihaly Csikszentmihalyi, who uses the word *meme* (from Greek *mimesis*, meaning 'imitation') to describe a unit of information, attitude or way of thinking that is replicated through cultural imitation and tradition: Csikszentmihalyi defined it as 'any permanent pattern of matter or information produced by an act of human intentionality'.<sup>34</sup> In the context of design, Wahl and Baxtor argue that vMEMES can be understood as patterns of meta-design that determine why, what and how we design.

The first six levels of development are described by Graves as *sustenance levels*, meaning that they are primarily focused on desiring, acquiring, possessing and acting in such a way as to end a feeling of shortcoming, whether physical or spiritual. (Wilber replaces the word *sustenance* with *deficiency*, but the principle is the same.) By contrast, the seventh level (Yellow) represents a fundamental shift in worldview, what Graves calls a 'monumental leap' in consciousness, which results in a change from a fear-based mode of existence to what she called a *being-based* mode, in which the individual will feel more free in relation to the judgment of other people, the social set of norms and so on, and more generally experience a greater degree of abundance and affluence.<sup>35</sup> The levels before and after this shift are described by Beck and Cowan as representing a *first-* and *second-tier* form of thinking, respectively.<sup>36</sup> Further, in the 1990s, Beck and Cowan added a further second-tier level, above the Yellow level, namely the Turquoise one.



Through the eight steps that make up the model today, the schematic layout of spiral dynamics describes the emergence and development of human systems of thought and social organization, as we pass through levels of increasing complexity. Crucially, the previous steps do not disappear when new ones emerge – instead, older, and newer forms of consciousness coexist at any one time. Every upward turn along the spiral ‘marks the awakening of a more elaborate version on top of what already exists’, as Beck and Cowan put it.<sup>37</sup> They further argue that ‘the same principles of Spiral Dynamics apply to a single person, an organization, or an entire society. As Spiral Dynamics describes human nature in a universal sense rather than through personality types or racial, gender and ethnic traits, the model provides a common language for grappling with both local and global problems. It offers a unifying framework that makes genuinely holistic thinking and actions possible’.<sup>38</sup> According to Wahl and Baxtor, the underlying goals and intentions of design solutions based on second-tier thinking will be

the maintenance and improvement of systemic health and the facilitation of healthy and cooperative interactions across the whole spiral of human worldviews and value systems, as well as across all physical and temporal scales of material design. [...] A holistic/integral perspective fosters conscious and responsible design, and meta-design thinking aimed at the creation of healthy societies in healthy environments. [...] A change in worldview, intention, and lifestyle, facilitated by dialogue and education, may be a far more effective way of problemsolving than the creation of more artifacts and technical fixes.<sup>39</sup>

According to Wahl and Baxtor, by applying spiral dynamics to transdisciplinary and trans-stakeholder mediation and decision-making, we can begin to appreciate chaos, and start to think ‘more like a creative designer than a reengineer. The process links functions, people, and ideas



into new, more natural flows that add precision, flexibility, rapid response, humanity, and fun to getting the work done'.<sup>40</sup> This sentiment is in line with the goal in this book, namely to explore how modes of being, including practices such as presenting and mindfulness, can contribute to design and design thinking. My question is in part how mindsets and methods from the discipline of design can help us find solutions to the complex ecological and social problems that revolve around the topic of sustainability, and in part how we can collectively explore what it might mean to produce and live in more sustainable ways.

In the table at page 55–62, I build on the schematic layout given by Wahl and Baxtor (which in turn builds on that by Graves, with additions from Wilber and from Beck and Cowan), and include also perspectives from Laloux. Crucially, I have added a final column to their presentation, which focuses on the relation between humans and their natural surroundings at each of the eight levels of development, to showcase how our understanding of ourselves in connection with 'nature' has changed over time. My aim is to show that the new worldview that is currently emerging, according to the theories of developmental psychology, also evinces a new *planetary* consciousness. This is a step in the development of humankind that, in keeping with Graves's theory of spiral dynamics, marks a cyclical return to the earliest stages of human development, in which there was also a strong feeling of connection with the natural environment: now, however, that same connection plays out on a higher level of consciousness.


One may object to the theories of developmental psychology that they are too narrowly focused on the Western world and that they are too tendentious in their projections of a presumed 'higher' level of consciousness – and not least in their assumption that this level will lead to a better and, in the context of the climate agenda, more sustainable future for humankind. But whether the future will indeed be brighter and better for humanity and

the planet does depend on how we use this presumed new consciousness. Will we really be able to take responsibility and fully rise above our own needs, or will we merely go for another ride around the spiral, pursuing new forms of inopportune interventions? Another aspect that may influence our projected new turn along the spiral of consciousness is the ever-increasing speed of technological development, particularly the remarkable progress in the field of artificial intelligence. In a very near future, we will presumably develop computer systems and networks whose capacity for thought far outpaces the human brain, a prospect that carries both utopian and dystopic possibilities. Such a future would be shaped not only by humanity's view of artificial intelligence but also by the artificial intelligence's view of humanity. What perspectives will that lead to? Who can be said to possess consciousness in such a scenario, who will be setting the direction for human life on earth, and who will direct the design machine?

Given the critical condition of the earth, AI also constitutes another kind of threat, as it may enable and even accelerate our on-going destruction of the natural world. In a planetary perspective, artificial intelligence may be dangerous because it may lack the empathy and conscience that humans have developed over thousands of years. In the most dystopic scenario, a design machine controlled by AI could set us back to a time before we became conscious of ourselves and able to shift perspective, by seeing the world through the eyes of others. But in a more optimistic scenario, AI may help us understand the complexity of the human-made world, and steer the planet as a whole in a wiser direction, e.g. by allowing us to predict the long-term consequences of our actions and thereby invite us to make more sustainable decisions. It is up to us to decide how we use the technology we have ourselves developed, and how we employ the historical knowledge of what our actions have led to so far: do we or do we not set a sustainable course for the future of humanity?

In Spiral Dynamics, Don Beck and Christopher Cowan popularize Clare Grave's theories about the development of human consciousness. Every

step is colour-coded and divided in tiers. Tier 1 is a level of Subsistence and Tier 2 is a level of Being.<sup>41</sup>



Subsistence  
Level 1  
First Tier  
C.100,000–  
50,000 BCE

Features	Mode of thought	Occurrence and influence	Relation to the environment
<p>Humanity lives in small bands organized by kinship.</p> <p>Foraging is the basis of subsistence.</p> <p>Organization: The social structures are loose bands, with no hierarchy.</p> <p>Resource extraction and energy production: Keep the fire burning.</p>	<p>Automatic thinking</p> <p>The process is survivalist.</p> <p>Extremely high levels of violence and murder.</p>	<p>Approximately 0.1 per cent of people and 0 per cent of power.</p> <p>Today, there are only a few remnant tribes with this form of life.</p>	<p>Entangled with nature.</p> <p>The experience of the self (ego) not yet fully developed; one does not see oneself as fully distinct from the environment.</p> <p>The developmental psychologist Jean Piaget compares this level with the baby who does not yet see itself as distinct from its mother.</p>

## Subsistence Level 2 First Tier

C.15,000 BCE

Features	Mode of thought	Occurrence and influence	Relation to the environment
<p>Humans begin to gather in larger groups, of up to a few hundred.</p> <p>Hunter-gatherer societies, also known as 'magical societies'.</p> <p>Organization: The social structures are tribal.</p> <p>Resource extraction and energy production: Between approximately 70,000 and 30,000, humans develop boats, bows and arrows, and other tools that make it easier to hunt and gather. Incipient domestication of animals: hunting and guard dogs.</p>	<p>Magical-animistic thinking</p> <p>The process is circular.</p> <p>Relations between cause and effect are poorly understood; the universe is full of spirits and magic.</p>	<p>10 per cent of people and 1 per cent of power. Few societies and tribes with this form of thought remain.</p>	<p>Fear and respect.</p> <p>The relation to nature is based on equal parts fear (of wild animals, storms, and the like) and respect (for the immaterial forces that are thought to inhere in nature).</p> <p>Animistic system of belief. One has to contend with various kinds of powers and beings; e.g. in mountains, rivers, and stars. Objects and ritual artefacts can affect certain outcomes, in e.g. hunting and reproduction.</p>
			<p>In developmental psychology, this period is compared with children of approximately 24 months, where the child experiences both sensorimotor and emotional differentiation.</p>



Subsistence  
Level 3  
First Tier  
C.10,000 BCE

Features	Mode of thought	Occurrence and influence	Relation to the environment
The first chiefdoms and proto-empires emerge.	Egocentric thinking The process is exploitative.	20 per cent of people and 5 per cent power.	Threats and opportunities.
Transition from hunter-gatherer societies to agrarian societies.	The emotional spectrum is crude, needs are expressed through violence and the submission of others.	Today, this paradigm still operates in some spheres, such as combat zones, civil wars, failed states, prisons, violent neighbourhoods, wolf packs, mafias. <sup>42</sup>	Humans see themselves as distinct from their natural surroundings. This division is experienced as terrifying: the natural world is a dangerous place, and one must be strong in response. The earliest cities are encircled by walls (marking territorial power). The currency of the world is power.
Organization: The structures are empires. Division of labour and differentiation between social roles. Slavery appears.	Thinking is shaped by polar opposites such as strong/weak, my way/your way		According to Piaget this reactive pattern is seen in underprivileged areas and in people who did not receive sufficient nurture as children.
Resource extraction and energy production: Early forms of settlement, first cities. Development of new tools to acquire foodstuffs.	Simple causal relationships such as rewards and punishments are established.		

## Subsistence Level 4 First Tier C.4000 BCE

Features	Mode of thought	Occurrence and influence	Relation to the environment
<p>Fully agrarian societies. Humans go from procuring to producing food. Surplus of food is stored, and the storage of resources forms the precondition for the establishment of states relying on taxation. Centralized organizations emerge, controlling and protecting their territory.<sup>43</sup> Property rights, state structures and organized religions appear.</p>	<p>Absolutist thinking</p> <p>The structures are pyramidal, the process is authoritarian.</p> <p>Thinking shaped by 'us v. them'.</p> <p>Reality is perceived through proto-Newtonian eyes: relations of cause and effect are understood. Linear time (past, present, future) is established as a precondition for agrarian societies: the cultivation of plants requires long-term planning (sowing today yields food next year).<sup>44</sup></p>	<p>Approximately 40 per cent of people and 30 per cent of power.</p> <p>This paradigm still exists in societies that are defined by caste systems and a strong division between social classes, as well as certain bureaucracies and organizations with strictly defined roles and hierarchies, such as the military and the Catholic church.</p> <p>The earliest larger corporations under the industrial paradigm also used this mode of thought.<sup>45</sup> Business practices like Taylorism and Scientific Management were based on the premise that workers had to be controlled with clearly defined goals and an autocratic leader.</p> <p>The social pyramid, perfected in the Roman army, became the norm and is still the world's most widespread form of organization.<sup>46</sup></p>	<p>Protection and reward. The relation to nature is based in part on protection (from animals and weather), and in part of exploitation of resources, to establish one's independence.</p> <p>PowerGods (polytheistic) are not thought to inhere in nature, but in a world separate from that of humans (e.g. Valhalla, Olympus, etc.)</p> <p>Nature is not thought to 'answer back' to human exploitation, e.g. in the form of failed crops: the gods act <i>through</i> nature. In case of failure, the balance must be righted in one's relation to the gods, not nature.</p> <p>Piaget compares this stage with children of six to seven years, who have received parental nurture and can perform shifts of perspective (see the world through the eyes of others). Focus on social recognition and assimilation: what do others think of me?</p>
<p>Organization: Obedience to authority. Absolute belief in one right way. Submission to power (including formalized hierarchies) in exchange for protection.</p>			
<p>Resource extraction and energy production: Food is acquired through new technologies and artefacts, from irrigation systems to modes of transport. The travel-light life of the hunter-gatherers is replaced by a constant accumulation of possessions, a hoarding that we have never since ceased.</p>			



Subsistence  
Level 5  
First tier  
C.1500

**Features**

The orange paradigm emerges during the Renaissance's break with the central authority of Christianity and other structures; and becomes dominant during the Age of Enlightenment and the Industrial Revolution. After the Second World War, this paradigm occupies a still larger part of the Western world.

Organization: Transition from seeing organizations as machines to focusing on innovation, empowerment and meritocratic delegation of authority.

Resource extraction and energy production: Steam power, the combustion engine and electricity lay the technological groundwork for the optimization and rationalization of production. The production of food and goods increases exponentially, and the security of supply is guaranteed.

The Great Acceleration (as described on page 66-67) begins.

**Mode of thought**

Diversified thinking

The structures are delegative; the process is strategic.

Scientific achievement: The self escapes from the herd mentality of the Blue level, and seeks truth and meaning in individualistic terms.

Possibility-thinking, focused on making things better for one self and one's surroundings. What-if thinking predominates, supplanting hard-and-fast rules.

**Occurrence and influence**

Approximately 30 per cent of people and 50 per cent of power.

This paradigm is still the most dominant worldview among most leaders in business and politics.<sup>47</sup>

**Relation to the environment**

Command and conquer.

The relation to the natural environment is focused on control and subjugation by means of an ever-expanding instrumentalization and rationalization.

The Enlightenment philosopher Francis Bacon's dictum from 1620, that nature should become 'the slave of mankind', establishes a dichotomy between humans and nature, further strengthened by the philosophy of Descartes: 'Nature' is defined as an Other in relation to mankind.

Within developmental psychology, this perspective corresponds to older children's ability to master complex tasks through a trial-and-error process. It calls for an ability to think independently and to question existing dogmas.

## Subsistence Level 6 First Tier C.1850

### Features

The green paradigm takes a critical view of the consequences of industrialization, including its focus on performance, materialism, social inequality and loss of community and coherence. It begins with the critique of modernity in the second half of the nineteenth century and becomes more widespread with the environmentalism and anti-materialism of the 1970s. Today, it is found e.g. in innovation- and knowledge-based businesses with flat hierarchies and a large degree of motivation-driven self-management.<sup>48</sup>

Organization: Communitarian, network-based, pluralistic. Uneasy relation to power and hierarchy.

Resource extraction and energy production: through outsourcing and global cooperation, the production wheel turns night and day.

### Mode of thought

Relativistic thinking.

The structures are egalitarian; the process is consensual.

HumanBond: The well-being of people and the establishment of consensus are prioritized highly.

### Occurrence and influence

Approximately 10 per cent of people and 15 per cent of power.

This paradigm is represented by e.g. cooperative societies, indie-cultures and countercultures. Today it is also practiced by corporations that are led according to value- and culture-based principles and stakeholder-models.

### Relation to the environment

Destruction and disrespect.

Though it strives for consensus, this paradigm is still fully focused on human needs. There is a growing awareness that our behaviour has destructive consequences for the environment, but overproduction and complacency are still allowed to continue, at rates that are irresponsible from a planetary perspective.

Within developmental psychology, this perspective corresponds to teenagers, who set their own needs first while being critical of authorities – in some cases leading to narcissism.





Being Level 1  
Second Tier  
C.1980

Features	Mode of thought	Occurrence and influence	Relation to the environment
<p>There are substantial similarities between the second-tier yellow and the first-tier beige system of values, though they are placed on different tiers of consciousness. Both systems are focused on survival, but whereas the beige level is concerned with individual survival, the yellow is focused on the survival of the planetary eco-system.</p> <p>Organization: Integrative social structures, marked by flexibility and spontaneity. Life is a kaleidoscope of natural hierarchies (holarchies), systems and forms. Resource extraction and energy production: Focus on renewable energy and regenerative principles for production and consumption.</p>	<p>Systemic thinking.</p> <p>The structures are interactive; the process is integrative.</p> <p>Flexible adaptation to change through an interconnected, big-picture view of the world.</p> <p>The inclusion of minorities and women: everyone must be given equal rights.</p>	<p>Approximately 1 per cent of people and 5 per cent of power.</p> <p>New models of management are being developed. The challenge is how to set a course with little or no formal leadership? How to secure responsibility and distribution of work in a consensus-based culture? Continued reliance on the structures and goals of the Orange and Green paradigm.</p>	<p>Ecological sensitivity.</p> <p>Frustration about the state of the world, eco-depression, attempts at activism. Radical break with dualistic thinking (humans vs. nature) by recognizing that we are a part of nature.</p> <p>Within developmental psychology, this perspective corresponds to young adults, who begin to take responsibility and look beyond their own needs (and the needs of their immediate social circle), so as to respect and care for the larger system of which they are part.</p>



## Being Level 2 Second Tier C.2000

Features	Mode of thought	Occurrence and influence	Relation to the environment
<p>In the 1990s, Wilber, Beck and Cowan argued that just as the yellow level corresponds to the beige, so does the emerging turquoise level correspond to the earlier purple level. This new level is characterized by an attention to whole-earth dynamics and macro-level actions. The worldview is holistic.</p> <p>Organization: Where the Orange level sees organizations as machines, the turquoise level frames the growth of organizations and societies as living systems.</p> <p>Resource extraction and energy production: As in the Yellow level, the goal is that humans should live in harmony with nature, through a regenerative form of production. Whether we achieve this goal depends on whether we can harness the new technologies smartly, so that they benefit not just humans, but the planetary whole.</p>	<p>Holistic thinking.</p> <p>The structures are global; the process is fluid and ecological.</p> <p>Combine emotion and knowledge; multiple levels are interwoven into one conscious system.</p> <p>Focus on 'taming the ego', through a recognition that the fears, ambitions and desires of the ego determine the shape of our lives. To observe the ego at a distance allows for a feeling of connection with (and so trust in) others.</p>	<p>Approximately 0.1 per cent of people and 1 per cent of power.</p> <p>This form of management corresponds to what Laloux terms 'TEAL management' (named after the greenish-blue colour of this level).</p>	<p>Evolutionary worldview.</p> <p>A longing for the experience of holistic connection with others and one's natural surroundings, as well as an interest in alternative forms of thought, such as new and ontologies of the Anthropocene of wisdom traditions, including neo-aimism and indigenous thinking. The previous stages of development allow us to practice forms of being without the fear and violence that characterized the magical and animistic thought of hunter-gatherer societies.</p>

## A new paradigm for design and design thinking

If we look at the history of humanity through the lens of developmental psychology, we can, from a purely human-centred perspective, see it as a story of enormous empowerment. Equipped with the worldviews and values – the meta-design – that have shaped our development since we first began to cultivate the earth and design ‘on’ nature, up to the hyperconsumerism of modern societies, we have experienced remarkable growth and wealth in many parts of the globe. But if one looks at this same development from a planet-centred perspective, one could argue that the empowerment of humanity is in fact a kind of *arrested development*, in which we have failed to understand the consequences of our new powers: the current ecological condition points to a fundamental flaw in the values that have so far shaped our design and creativity. Ever since we moved out of nature and into our own designed surroundings in the Blue level, human behaviour has become an ever more grandiose rampage through our natural surroundings, steered by a kind of species-wide narcissism. In the terms of developmental psychology, one can claim that our current situation, in which we know so much about the destructive consequences of our action but refuse to change course, is a mark of profound self-obsession. The Green level, which generally strives for harmony and consensus, has therefore been given the label ‘Destruction and disrespect’ in the table at page 55-62 (column four) when it comes to its relation to the natural surroundings. The behaviour of this level can be compared with that of a teenager, who is critical of authorities and eager to establish an alternative way of life, but still sets their own needs first, sometimes in narcissistic ways. In the face of the climate crisis, it may be high time to grow up and take responsibility for the planet and the life it has given us, our forebears, and those who will come after us, as well as for the myriad other life forms with whom we share the Earth. As the

in one way or another all of the important questions of our age have to do with how we get on with the Great Work, transforming human activity on the earth from destruction to participation and human attitudes toward nature from a kind of autism to a competent reverence.<sup>49</sup>

Orr also argues that it would be foolish to think that the destructive processes which have taken several centuries to build up can be undone quickly or entirely. But it would be equally foolish to conclude that we are therefore doomed and should give up hope. According to Graves's theory, the process of moving from one level of development to the next is usually not gradual, but takes place in quantum leaps. However, these leaps occur infrequently, and it sometimes takes millennia for a new worldview to arise. But those who live through these periods of transition may regard it as a painful experience. On the individual level, most of us know that the transition between life-stages can be difficult – as with the child becoming a teenager or the teenager becoming an adult. During these periods of change, many will feel that the things they once found important, fun or meaningful now seem futile. This may lead to a sense of emptiness, and perhaps an alienation from oneself and one's surroundings. Something similar may currently be happening on the collective level, magnified to global dimensions, and rippling through our shared consciousness, as evidenced for example by the drastic increase in depressions worldwide. According to WHO, more than 264 million people now suffer from depression. This is an increase of 49.86 per cent since 1990.<sup>50</sup> Even those who have not been diagnosed with depression often experience a sense of emptiness, perhaps a longing for a different way of life – without necessarily knowing what that other life would be like. Perhaps this is also the result of the cynicism and irony that has become particularly

common in the postmodern mindset of the Green level: we've seen it all before, we know it all already, so we may as well make fun of it, sneer at it, irreverently repurpose it in new ways, or descend into boredom or paralysis.

Compared to the other species and life forms around us, one could argue that we humans are privileged. The higher levels of consciousness we have achieved enable us to reflect on ourselves, and to make ambitious plans for the future and follow them through: a jellyfish or a deer cannot write books or design bridges. But it seems that we are using this privilege only to protect our own position as a self-centred species and, through irony and cynicism, to burst any bubble of meaning and value in the world. Should we not instead take the power we know ourselves to possess and see it as a kind of obligation? We do not need any more knowledge about the consequences of our actions – what we need is the new mindset that this knowledge ought to produce.

In an optimistic light, one may see the Paris Agreement and the Sustainable Development Goals of the United Nations as political examples of the new kind of consciousness, the 'tier-two consciousness' – though according to Wilber's calculation, it is still only approximately 0.1 per cent of people and 1 per cent of power that are characterized by this form of consciousness. By his account, most of the world's leaders still inhabit the blue or orange level, in which one prioritizes the centralisation of power and varying degrees of 'us v. them'-thinking. These mindsets are reflected in the widespread emphasis on competition between businesses, organizations and nations. This is not to say that competition is inherently bad – it may stimulate people and societies to new forms of action – but it does stand in the way of a shared understanding of our common challenges and possibilities. From a planetary perspective at least, it does seem highly counterproductive that we have become so unable to cooperate, when any global awareness would show that we are all in the same boat: it does not matter whose end

of the boat has the hole in it; we must work together to repair it. Leaders like Trump, Putin or Bolsonaro can be taken as examples of what Graves calls the Red level, in which one enforces power over others and over nature to establish one's independence through exploitation. If the election results in three of the world's largest nations – USA, Brazil, and Russia – are anything to go by, many of us still prefer this form of autocratic leadership, especially in moments of crisis. But according to research in developmental psychology, this tendency reflects a 'lower stage of consciousness': in caricatured terms, it bespeaks a worldview in which the strongest ape is the one who can kill the most competitors and copulate with the most females – and that ape will then be allowed to withdraw from the Paris Agreement and burn down the rainforest.

The pyramidal social structure connected with this paradigm, which has been influential ever since the rise of the first civilization, and which continues to be the single most widespread form of social organization, has shaped and legitimized an uneven distribution of resources, money and welfare: from the pharaonic kingdoms of ancient Egypt through Medieval feudalism to the grotesque, even laughable distribution of wealth that we see in the modern world. Today, just eight men own the same wealth as half of the world's population.<sup>51</sup> This pyramid of inequality has only become steeper during the COVID-19 crisis. According to a study published by Oxfam in January 2021, the 1000 richest people on the planet regained the money they had lost during the disruption of the COVID-19 pandemic in just nine months: meanwhile, the world's poorest may not recover from its economic impact for decades.<sup>52</sup> When the zeitgeist turns once more, the things that are going on today will inevitably seem farcical, especially as the world's richest continue to deepen the inequality crisis by dodging taxes, opposing the raising of wages, crushing unions and impeding the implementation of redistributive policies. How would the new tier of global consciousness that Graves and his successors see as emerging affect this

state of affairs? As mentioned earlier, each new level does not supplant but exist alongside the previous levels, and as Laloux points out, there have never been as many levels existing in parallel as there are now. Accordingly, the newly emerging global consciousness exists in many forms, as shown especially by the many different strategies that are currently being used to deal with our Anthropocene impact on the world. At one end of the spectrum is what we might call *exit strategies*. In their most radical form, for example in the plans by Elon Musk, Bjarke Ingels and others, this would entail leaving the planet to colonize a new one, creating the ultimate gated community: Mars for the ultra-rich. More earth-bound but equally protective versions of the exit strategies include the continued harvesting and extraction of natural resources from the Earth, according to the logic of ‘getting as much out of it while we still can’. In their most extreme form, these strategies are represented by the destruction of the rainforest in Brazil, which aims to establish as many plantations as possible while the global price of food is still high. In both forms, these exit strategies evince the ‘command and conquer’ logic of the Orange level, just transposed to the global perspective that is characteristic of second-tier consciousness: here Earth and even other planets are seen as something that can be owned, consumed exploited for the benefit of humanity and then discarded – with the rewards going to the most privileged groups, of course, according to the logic of the pyramidal structure.

At the other end of the spectrum are those strategies that belong to the Yellow and Turquoise level of consciousness, and which entail progressive commitments to sustainability, as indicated for example by the many theories and strategies of sustainable transformation that have been proposed over the last decades. Given their emerging nature, we can still only see the bare outlines of this new worldview. At the global level, we have achieved only the smallest consensus about what we should and should not do in the future. The challenge now is to establish a



global agreement about what kind of worldview should form the basis for new visions about humanity's future on Earth. We all have a hand in shaping this consensus, through the ways in which we see ourselves in relation to the rest of the world, and through the physical manifestations of our values. We may be witnessing a plethora of parallel worldviews, but from these there will hopefully emerge a greater degree of global agreement about the form of life that humans should strive for.

## The Great Acceleration

When we set foot on the Moon in 1968, humanity for the first time became able to see the Earth from the outside. Four years later, in 1971, the report *Limits to Growth* – described more fully in chapter 5 – appeared, showing that the exponential growth of capitalist production was unsustainable: there are too many of us, our consumerism is too great, so if we are to protect our planet, we have to bring down our consumption. Since then, countless studies and calculations have given us a more precise understanding of what researchers now call ‘The Great Acceleration’.<sup>53</sup> This process is presented on the next pages in the form of 24 diagrams, which illustrate the exponential growth that has taken place on a range of decisive parameters, both within socio-economics and earth systems. Among the socio-economical parameters (shown on the left), we find the rise in global population, BNP, consumption of fertilizer, large dams and production of paper. Among the earth-systems parameters (shown on the right) are the emissions of carbon dioxide and methane, the acidity of the oceans, the area of domesticated land and the loss of tropical rainforest. The dramatically increasing effects of human activity on the functional systems of the planet are reflected in the sharp rise of these trendlines from 1945 onwards, that is, when the Orange level became most dominant. Tellingly, the graphs on the left and the right side resemble one another, showing with unmistakable clarity that social developments, including the

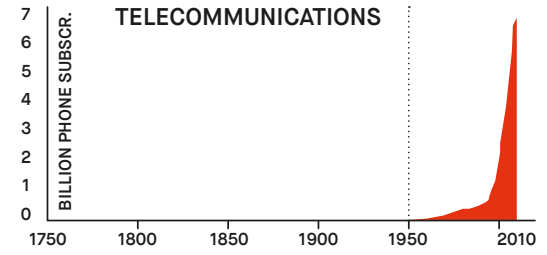
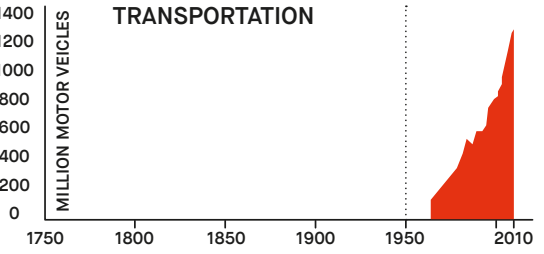
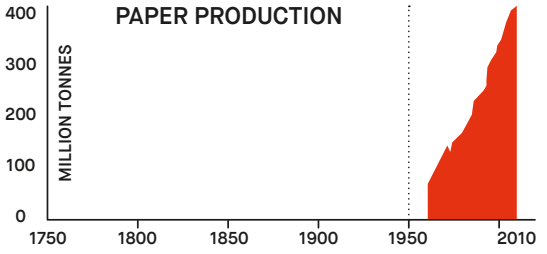
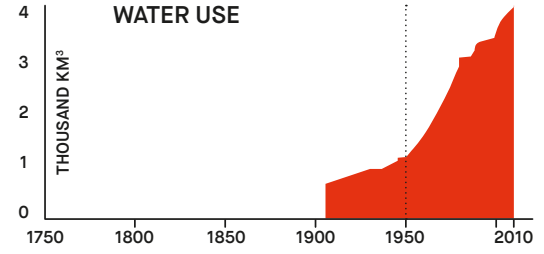
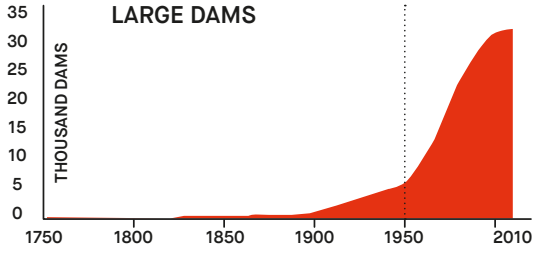
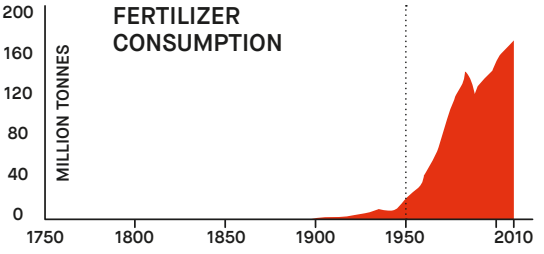
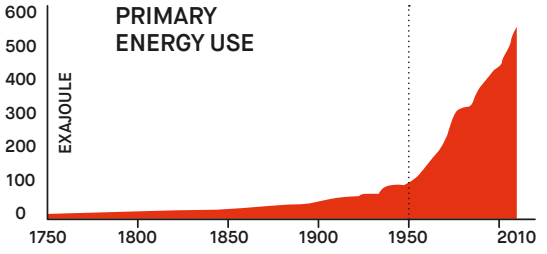
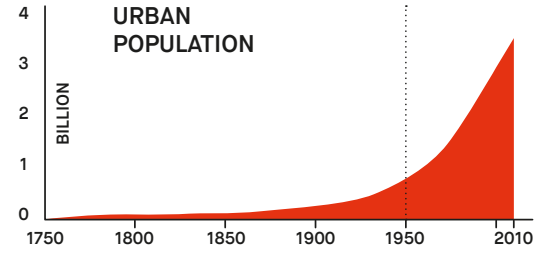
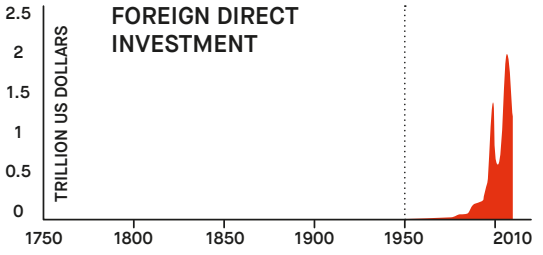
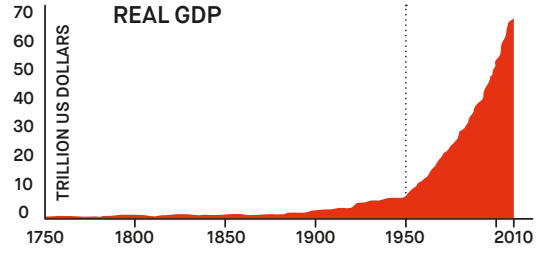
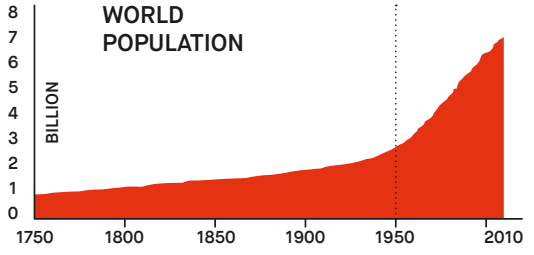


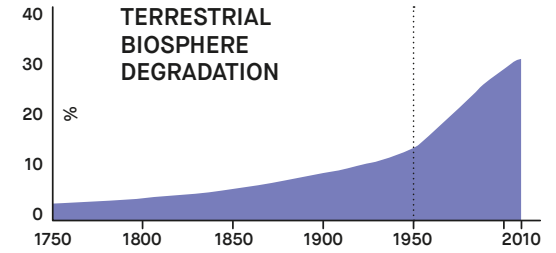
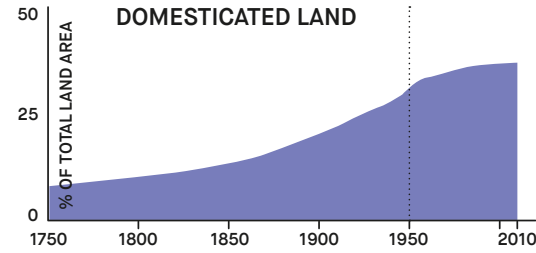
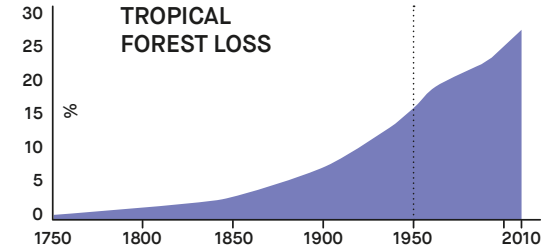
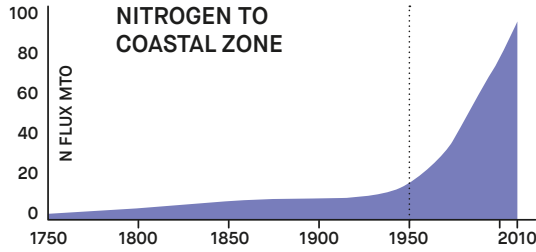
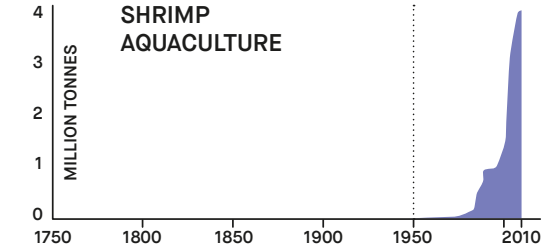
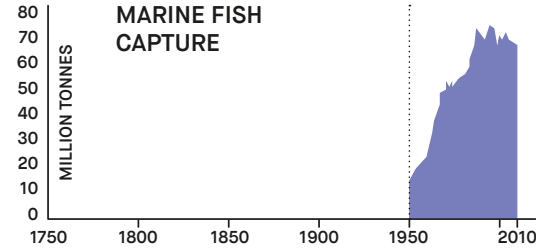
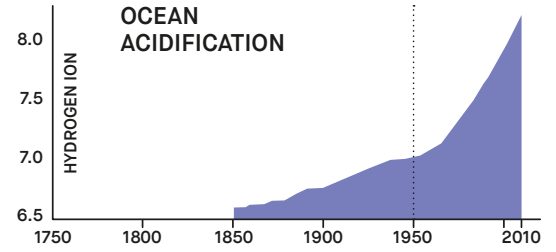
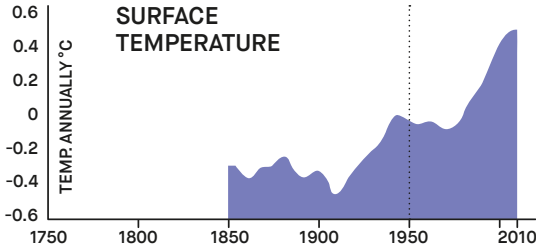
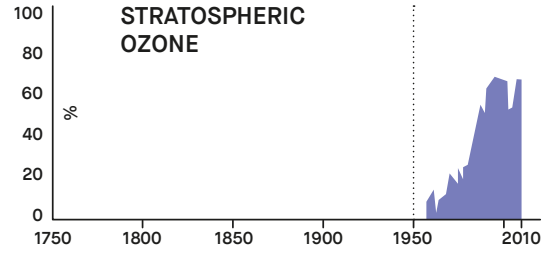
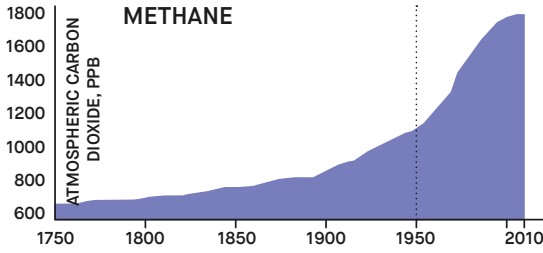
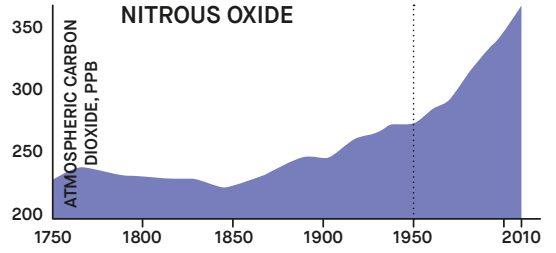
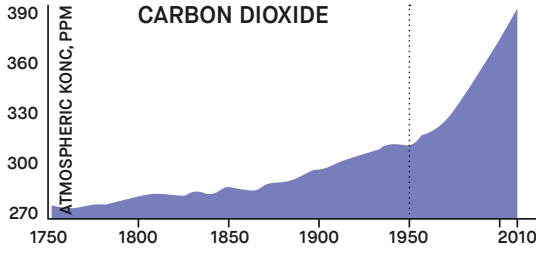
biopsychological factors, have large-scale effects on the environment: the empowerment of humanity has come at the cost of the world's resources.

In the period covered by the graph, we have gained a still greater knowledge about the world and its possibilities. During the Age of Industrialization, this increase of knowledge was a cause for optimism, as it fed into the 'command and conquer' mentality of the Orange level's relation to the natural surroundings. There were no limits to human power. In a planetary perspective, we may ask ourselves where humanity is headed at such frightening speeds? The question is not only how fast we can race down this road, but whether we are going in the right direction, or whether we know where we are headed, and whether we even care.<sup>54</sup>

The 24 graphs on the next pages are divided into two kinds of graph: The Earth system graphs show aspects of the health of planet: emissions of carbon dioxide, surface temperature, ocean acidification, tropical forest loss, etc. The graphs for socio-economic trends are indicators of human economic activity: global population, GDP, energy use, fertilizer consumption, water use, telecommunications, etc. What most of the socio-economic graphs have in common is that

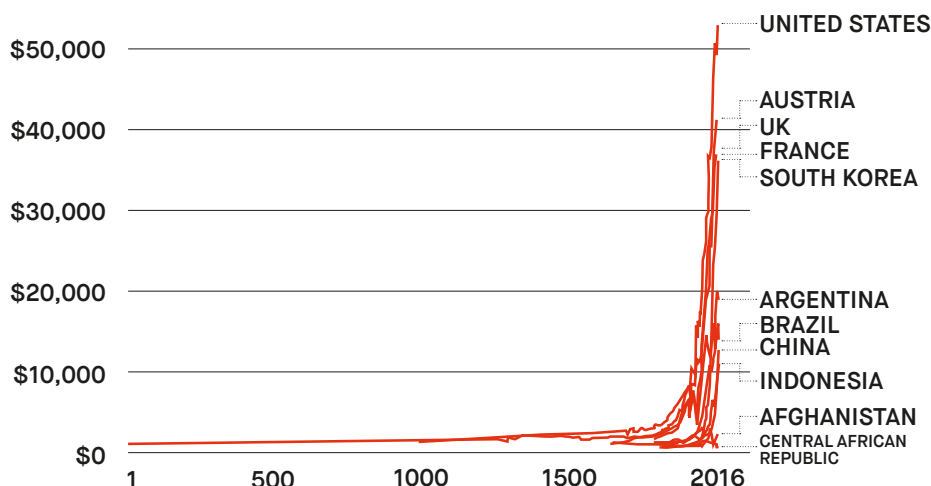
they start to accelerate around the year 1950. The health indicators for planet Earth also show pronounced growth from 1950 onwards, although many were rising steadily even before that year, e.g., tropical forest loss and carbon dioxide emissions. Taken as a whole, the 24 graphs indicate that the 'Great Acceleration' started in 1950. Consequently, that year seems to be a plausible candidate for the beginning of the Anthropocene period.





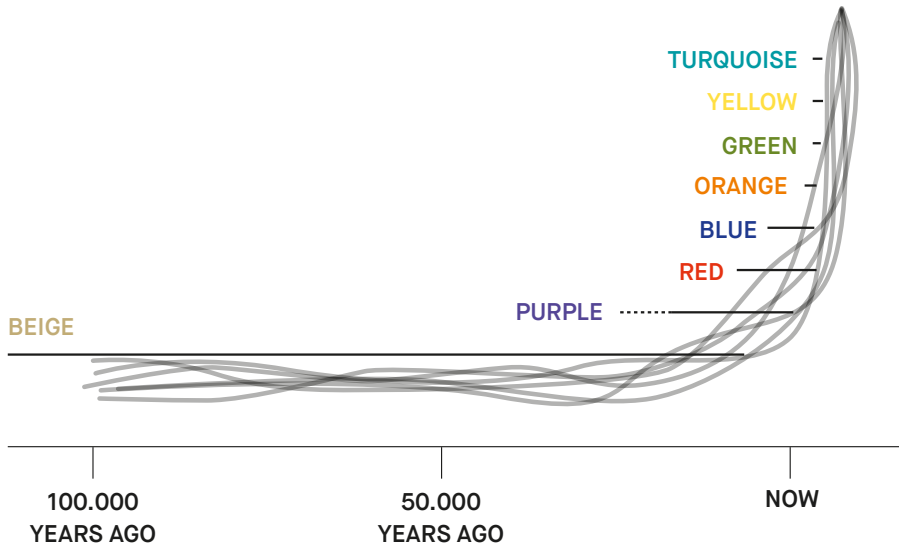
## BNP PER CAPITA, 1 TO 2016

BNP per capita adjusted for price changes over time (inflation) and price differences between countries – it is measured in international-\$ in 2011 prices.



The graph shows the BNP per capita of select countries from year 0 to 2016, revealing a dramatic rise in what we each produce after the Industrial Revolution.<sup>55</sup> From the 1950s onwards, the world has seen an extreme explosion in global population, while the standard of living has been growing steadily and with it the production power that can be invested in business and in ever-increasing economic growth. Seen from the lens of developmental psychology, it is in the Orange and Green levels, with their human-centric focus on

independence and development, that we see the largest and most dramatic interventions in the natural environment. But in that same process, we have become still more distant from the natural world that forms the precondition for our life on the planet. From the planetary perspective that characterizes the Yellow and Turquoise levels, we should be ready as humans to understand and take responsibility for the state of the globe, changing the course of our mindless production.



Stages of development. As shown by this graph, inspired by LaLoux, there has never in human history been as many developmental paradigms operating in parallel as there are today. This may be one reason why it is so difficult for us to find a shared sense of direction and purpose, and why

we see so many cultural clashes with painful and deep divides. This trend is strengthened by the still more differentiated media landscape, and not least by social media, which allows for the emergence of echo chambers, making any global conversation impossible.<sup>56</sup>

We have reviewed the history of humanity from the perspective of evolutionary and developmental psychology, showing that every new level of development is born out of a change in values and worldview. We now find ourselves at the point where a new level of consciousness seems to be emerging, a level that includes a shift from a homocentric mindset to solidarity on a planetary scale. In this level, the sustainability of all ecosystems will come to be seen as the necessary condition for the well-being of humanity.

## The road so far: Milestones

### *Traditional hunter-gatherer societies*

Human beings live in small groups based on kinship. They are nomadic and move with the changing of the seasons. The worldview is animistic and is based on connectedness to nature. The use of resources and energy is limited to the mastery of fire and primitive tools (beige subsistence level).

### *Agrarian societies*

Humanity 'moves out of nature' and begins to design nature through domestication and cultivation. The concept of hierarchies, organization, property, 'us-them' and 'yours-mine' are introduced. This is the age between the end of the hunter-gatherer societies and the first proto-empires (purple and red subsistence levels).

### *Industrial society*

The human use of energy and resources accelerates. Early mass media, such as the telegraph and television, tie the world closer together. The instrumental and rational approach is built on control and subjugation. 'Nature' is defined as humankind's Other. The Great Acceleration

picks up speed, leading from the Renaissance and the Age of Enlightenment to the emergence of highly industrialized societies.

### *Information society*

Resources are exploited in hyper-drive, leading to an overproduction of everything from chicken nuggets to satellites. Everything is digital; AI and big data change the way we live and connect. Ideologies erode into a cacophony of voices; there are no shared narratives, except perhaps for the ideals of global growth and innovation (green subsistence level).

## The road ahead

We are facing dilemmas about how to use the knowledge that science and technology have given us. What will we do with the knowledge we have about the critical state of the planet?

The worldview and values of the yellow and teal levels in the spiral-dynamics-model offer a new mindset based on planetary consciousness. It is a mindset where competition, conflict and separation must give way for ‘the bigger picture’, allowing us to set a new course for our existence on Earth.

Regardless of what level of consciousness we find ourselves at, it is evident that we currently stand at a cross-road. We can continue along the trajectory that has been laid out by the historical development so far, or we can use the current crisis to take a step back and ask ourselves if we are imagining – and thus designing and creating – from the right place? With this question and the historical background in mind, I will now turn to the future, and look at how we can work with the challenges that are facing us.

*We are becoming aware that man, whether for good or bad, has stepped outside nature. He is bound to it, but he builds a second world over it, that of his own constructions. Our world is no longer nature embedded in the cosmos. In a pubertal rush of self-decision, we have detached ourselves from alliance with universals and follow our own ends. These turn out to be as daredevil as they are fatal and we would have to accept it if, because of our constructive autonomy, mankind was to cease to exist in the next century.*

– Otl Aicher<sup>57</sup>



# Chapter 2. Wicked Problems. How Can We Handle the Trouble?

The influential design theorist Ezio Manzini once argued that design can lead to both innovation and destruction. For Manzini, design should be seen as a key profession in our responses to the climate crisis, since the crisis can be understood as the most absolute and terrifying expression of human design, to the point which its scale and scope can be difficult to comprehend.<sup>58</sup> As a discipline that is aimed at developing that which does not yet exist, all practices of design must therefore be oriented towards the creation of a sustainable society both on the micro and the macro-levels. Following in the line of that my claim is that all future design forms should therefore not only be assessed by whether they satisfy *human* needs, the world *for-us* approach. Moving forward, the most important quality of designing must be whether we can succeed in developing other

notions of relationality, by pursuing a *planet-centred perspective* in our creations. That is, a non-localized approach where all kinds of considerations are brought to bear on the design process, from our local environment to the world system that surrounds us.

For everyone working with design, such a planet-centred perspective would allow for a new and important rediscovery of materiality itself: the matter that the planet is made of. In philosophy, we are currently witnessing the resurgence of forms of thinking such as new materialism, speculative realism, neovitalism and panpsychism. Each in its different ways seeks to understand how objects, materials, people, systems and nature are mutually connected in networks of presence and sensation. Despite their different approaches, these forms of thinking are alike in that they open new discussions about the relation between humans and non-humans, people and nature, and most fundamentally, living and inorganic matter. These debates have largely centred on revisiting received ideas about what can and cannot be considered alive, and what does and does not have a right to life.<sup>59</sup> Other central topics include a re-examination of what constitutes rationality and irrationality, how these two spheres might relate to each other, and how they are mediated in language and other forms of communication.

What has emerged from these discussions is a still more widespread focus on relationality, which implies a view of the world as made up of countless and diverse but always interconnected elements. In turn, however, this notion has come under critical fire since the current focus on relationality may actually reinforce an underlying assumption of fundamental disconnection at the ontological level (as relations can only be said to connect otherwise separable entities) and so in fact hinder our acceptance of the world's total interconnectedness.

To put this another way, design theorist Tony Fry has argued that the problems we face today cannot be solved from within the epistemological and cultural framework that produced them. We, therefore, need new forms of understanding that can challenge fixed ideas about what constitutes materiality, or rather, what forms of material have value, not least in design processes. Just as societies have historically changed their ideological framework when they have had to change their living conditions, so too are we compelled to understand ourselves and our relation to the world in a new light.<sup>60</sup> This reframing will necessarily entail a fundamental break with the dualism that has characterized scientific thought since Descartes, privileging human consciousness above all else. This dualism has focused our reflections on our own being in the world and has led to external objects being viewed as philosophical suspects, since they could in principle be illusory (as Descartes famously claimed, the man outside my window may merely be a wax figure). One could argue that this notion conveniently gave humans *carte blanche* to reshape the world as they saw fit, ruling it autocratically. However, the conditions of the Anthropocene age mean that human interventions in the world result in a feedback loop of unprecedented scope. Humanity's relation to its surrounding environment is both more complicated and more entangled than what Descartes envisioned. This is what we learn from our current first-hand experiences with the unplanned and unwanted consequences of our meddling in the global ecosystem. When

we interact with the world even on an everyday basis, we are now forced to reflect on the world's self-determined forms of being. The Anthropocene age, therefore, necessitates a rethinking of what our reality is and how we should engage with what we do not understand.



The material turn marks a shift in how we conceive of materiality, and it has sparked new strands of thought such as new materialism, speculative realism, and neovitalism. Broadly speaking, the material world was once seen as a passive, manipulable, and meaning-neutral background on which humans could project their socio-linguistic film, but the material turn encourages us to engage with the independent agency of material objects and the conditions that they impose on us. In other words, it is not only imagination, language, and our mental constructions that are capable of creativity and meaning-making: so is materiality itself. Here

to the left picture of Liuzhou Forest City in the mountainous region of Guangxi in China, known as ‘the world’s first vertical forest’. Designed by Stefano Boeri Architetti, the city will accommodate up to 30,000 people in a structure that is covered by plants and trees from top to bottom.<sup>61</sup> To the right is a picture of New York Upper West side in a bird’s perspective. Despite humanity’s best efforts to remove ourselves from ‘uncivilized’ nature or ‘arrange’ civilized version of nature, the material turn makes us aware that we are nevertheless ourselves part of the natural environment, for better or worse.

Timothy Morton refers to the enormous challenges that we currently face as ‘hyperobjects’, a concept coined to describe a new ontological foundation that we can use to understand the Anthropocene. Hyperobjects are generally characterized by being ‘massively distributed in time and space relative to humans’.<sup>62</sup> Examples of such hyperobjects are legion and include global warming, the reduction of biodiversity, and the formation of plastic islands in our oceans. These objects are defined by their transcendence of human scope in both time and space, meaning that humans are unable to perceive them directly. For example, the ‘non-locality’ of climate change means that we will only ever observe specific symptoms of global warming; we will never confront global warming as such. Because it is a non-local hyperobject, global warming *is* here but it not *here*. The only way we can comprehend climate change is through scientific observation and conclusions drawn from their aggregate findings. When we understand that we are entangled in the ongoing creation and maintenance of these destructive hyperobjects, we can begin to practice what Morton calls *dark ecology*. This ecology is a way of grappling with the realization that we are ourselves implicated in the disturbing events that take place ‘out there’. When we understand that the terrifying reality, we experience has partly been created by ourselves, we can easily sink into depression and shame. The conceptual work of uncovering our own role in the ongoing disaster entails a natural horror, one that we must endure if we are to escape the denial and disguise that characterizes many current discussions of the state of the planet.<sup>63</sup> Morton’s concept of hyperobjects can be used to describe the ontological problem of conceptually grasping complex challenges.

In design studies, the problem of grasping complex challenges is often described as *wicked problems*. This notion was first introduced by Horst Rittel and Melvin Webber in 1973, as a way of describing how methods from design



could be used to work with large-scale political and social challenges, paving the way for the application of design approaches outside traditional design domains.

Rittel and Webber define wicked problems as ‘a class of social system problems which are ill-formulated, where the information is confusing, where there are many clients and decision-makers with conflicting values, and where the ramifications of the whole system are thoroughly confusing’.<sup>64</sup> With wicked problems, it is difficult to say what the problem is, how it began, and where it might end. There is no right way of understanding the problem because it involves many parties who define it differently – and who often insist that their definition is the only right one. Sometimes, the problem looks like it might be the symptom of another problem, and that could well be true: a wicked problem is interconnected with many other problems, and it can be almost impossible to tell them apart. Given their complexity, wicked problems are also defined by their uniqueness, in that a solution cannot simply be transferred from a previous problem in another domain.<sup>65</sup>

For Rittel and Webber, the opposite of a wicked problem is a *tame* problem. An example of a tame problem is the building of a bridge. This may well be a challenging and complicated project, but it will probably be at least *doable*: humans have been building bridges for millennia and we know how to do so again, all the way from measuring statics to managing budgets. Tame problems are problems that we can handle as long as we have sufficient expertise, time, money and know-how. A key point about wicked problems is that they only become truly wicked if we try to solve them like we would solve tame problems: that is, by splitting them into smaller problems and attempting to map relations of cause and effect. If we *are* dealing with a wicked problem, this will typically lead to an endlessly regressive causal chain and total confusion, making the problem even more complex than it was to begin with.

Rittel's argument is that we must approach wicked problems differently. We can begin by asking whether the problem is really there, or whether it might be viewed differently. Sometimes, wicked problems change and become more manageable when they are viewed from a new perspective, one that challenges those assumptions that led us to see them as a problem in the first place. If we have no pre-existing solution to the problem, another way of approaching the challenge is to prototype our way towards a better outcome. This is at least a way to get started. If we cannot calculate the process to begin with and lay out a foolproof plan, it might be better to go straight into beta mode: to make suggestions that have not been thought through, to present solutions that are not perfect, but which can be adjusted and developed along the way. Richard Buchanan has developed Rittel's theory of wicked problems further. He calls this process of problem-solving 'a synthetic sequence in which various requirements are combined and balanced against each other', yielding a final plan, but at the same time accepting the indeterminacy of problems. This implies that there are no definitive conditions or limits to design problems.<sup>66</sup> To engage in this kind of process, we have to first acknowledge that we cannot control or analyze our way out of everything. We also have to learn to live with the uncertainty and be able to stand firm in the open and the unknown, laying the tracks as we go, and suggest solutions as they evolve.

In the current context of the environmental crisis, design thinker G. K. VanPatter has argued that the concept of wicked problems can be used to understand how design and design thinking may be employed to handle challenges on a planetary level. Van Patter divides the field of design into four 'challenge arenas', metaphorically illustrated with different sizes of doodles. The different arenas are pointing to a historical development that has led to still greater degrees of complexity in design thinking – reflecting the changing nature of design that I also described in the introduction in connection with the in-



roduction of Buchanan's concept of the 'four orders of design'. In much the same vein, VanPatter operates with a fourfold division of a design. Arenas 1 and 2 deal with 'conventional design and design thinking', such as the design of a new logo or a new brand of chairs. Arenas 3 and 4 comprise challenges of increasing complexity on the level of systems, organizations, societies, and planetary networks, and it is here, VanPatter claims, that truly wicked problems can arise.<sup>67</sup>

**CHALLENGE ARENA****1****SMALL COMPLEXITY**

Logos, Posters, Packaging

**CHALLENGE ARENA****2****MEDIUM COMPLEXITY**

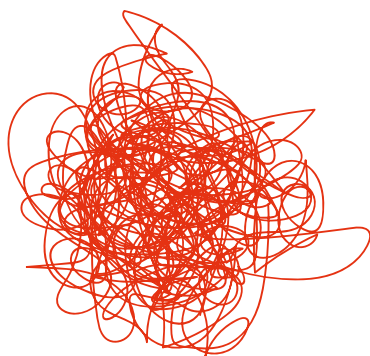
Products, Services, Experiences



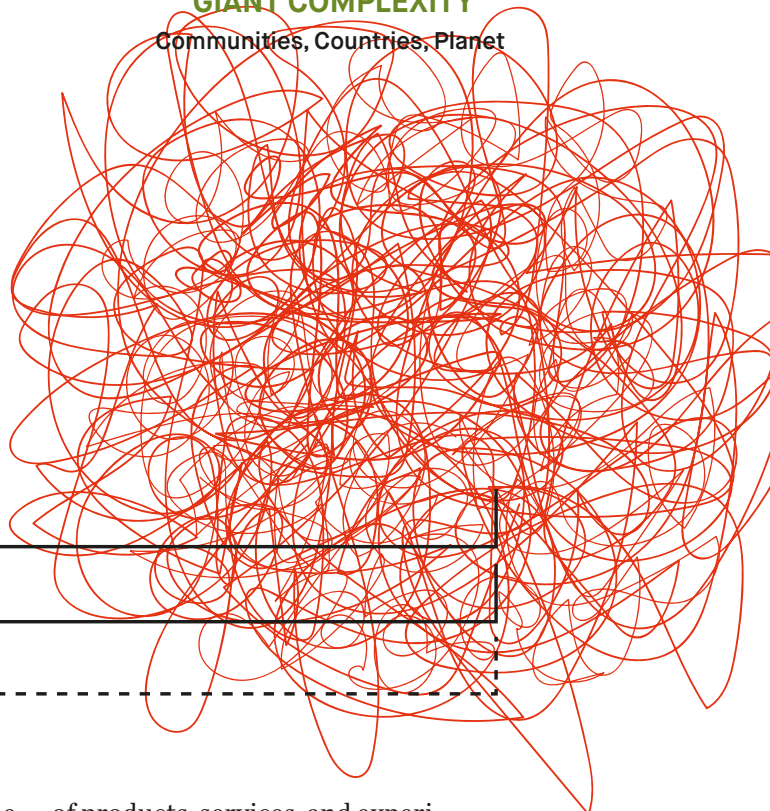
CONVENTIONAL DESIGN THINKING is here

**CHALLENGE ARENA****3****LARGE COMPLEXITY**

Organizations, Systems, Industries

**CHALLENGE ARENA****4****GIANT COMPLEXITY**

Communities, Countries, Planet

NEXT GENERATION EMERGING  
PRACTICE COMMUNITY is here

WICKED PROBLEMS are here

CURRENT CONVENTIONAL DESIGN  
THINKING METHODOLOGY GAP

GK VanPatter has proposed that the field of design can be divided into four 'challenge arenas', which range from the simple to the extremely complex. Arena 1 comprises conventional forms of design, which are characterised by having a relatively small degree of complexity, such as most graphic and traditional communication design. Arena 2 is concerned with the development

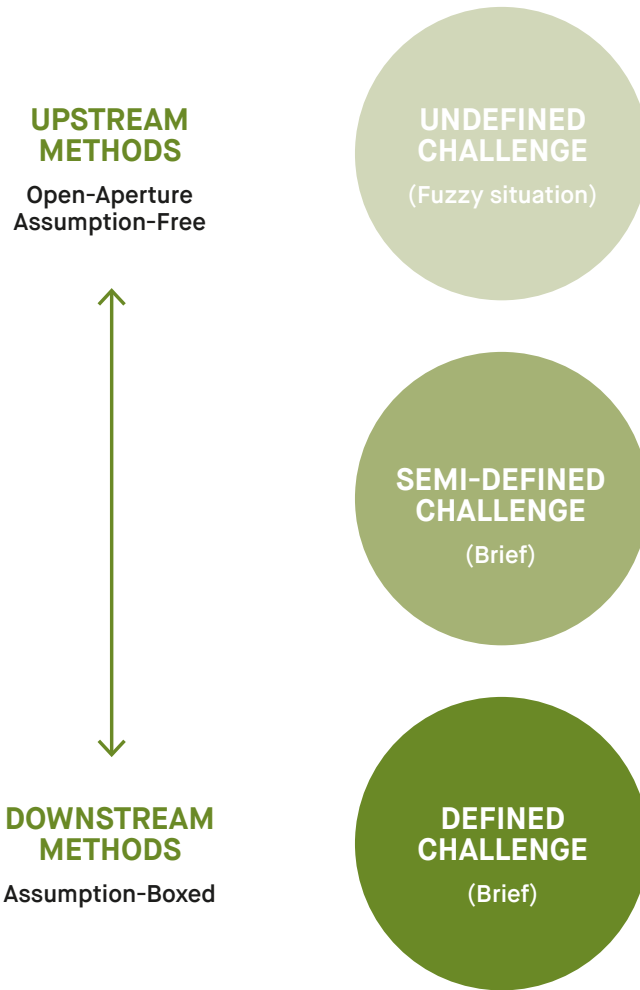
of products, services, and experiences that have a medium degree of complexity. Arena 3 involves the development of whole organizations, systems, and industries, and as such it has a high degree of complexity. Arena 4 entails challenges on the level of cultures, countries, and even planetary systems, and it has a giant degree of complexity.<sup>68</sup>

The difference between the arenas is that in arenas 1 and 2, the challenges are typically specific. Often, they are defined in a brief and are thus more or less ‘assumption-boxed’, being based on well-delimited specifications regarding the problem’s expected nature and possible solutions. An example of a challenge from arena 1 would be the design of new sustainable packaging for a product, where the brief clearly defines which materials and production methods should be used in the solution. As for arena 2, an example might be a new service design for waste management. Here, the brief would typically be more open-ended than in arena 1, and it may involve more requirements about for example how many wastebaskets can be assigned to each household if they are to fit into a regular kitchen or how to handle the many challenges regarding the gathering and transportation of the waste. In arenas 3 and 4, we are dealing with more open-ended or ill-defined challenges, also known as *fuzzy situations*, and thus with a more ‘assumption-free’ starting point. This could for example be the creation of a new sustainable neighbourhood in an old industrial port (a challenge from arena 3) or the reduction of CO<sub>2</sub> emissions on a national level (a challenge from arena 4).

VanPatter’s point is that, when approaching challenges in arenas 3 and 4, we have much to learn from the ways in which we solve problems in arenas 1 and 2, but we also have to develop new mindsets and practices to tackle these bigger challenges. Tackling such problems not only requires new kinds of skill sets that are assumption-free and open-ended in order to make sense of emerging constellations of challenge but it also entails cooperation with many stakeholders in the design process. Whereas challenges in arenas 1 and 2 can be executed or at least facilitated by professional designers, challenges in arenas 3 and 4 can only be solved through a distributed design competence, where many kinds of experts collaborate on a transformative and creative engagement with the existing infrastructure. At the centre of the shift from simple to high complexity in design development,

VanPatter places life-centred values and sustainability as the overall goal. VanPatter does not elaborate on how this value-based core could be carried out in practice, noting instead that more discussion and research in design studies are necessary. The aim of this book is just that: presenting suggestions of perspectives, thought models and tools for promoting a life-centred perspective in design and design thinking. I choose to call this endeavour a ‘planet-centred design approach’, to encourage dialogue about and a focused direction on our most pressing challenges.

The expansion of the concept of wicked problems is a result of the increased focus on relationality in the social sciences that I discussed previously. There are, so to speak, different fields, levels and even worlds of problem, which possess different levels of complexity and wickedness. In order to handle these problems successfully, we must learn how to step between such worlds, transferring knowledge from one to the other. In this book, I am primarily focused on challenges in arenas 3 and 4, but I would like to hold on to the experiences and skillsets of design that have been developed to deal with arenas 1 and 2 – while supplementing them with new ways of dealing with distributed design competences.



The shift from arenas 1 and 2 to arenas 3 and 4 requires a new approach to design, in which we go from having clear specifications that can be summarised in defined or semi-defined briefs, to having an open and assumption-free point of departure, where the challenge must be defined and perhaps even discovered as it is being resolved. Whereas challenges in arena 1 can typically be solved by a single designer working on their own, challenges in arena 2 are most often solved by

teams of professional designers, or by designers collaborating with experts from other fields. Working with the challenges in arenas 3 and 4 will require cross-disciplinary teams, the involvement of many different types of users and stakeholders, and many years of work. These arenas should not be seen as a fixed typology, but rather as ideal models that can help us reflect on the different kinds of challenges that designers face.<sup>69</sup>

One of the key tenets in the theory of wicked problems is that when the complexity of the problem is great and our knowledge of it is limited, it cannot be divided into more manageable parts but must be explored with an integrative mindset. This mindset does not pre-emptively separate the elements of the problem from one another but instead moves into the unknown with an open sense of possibility and perception. Across all four arenas of design, a design approach is characterized by its ability to stay in and move through varying degrees of messiness so as to move towards a concrete goal, be it a solution, a product, a strategy, or something else entirely. That is one of the core questions that design process studies have dealt with: *the problem of the problem*, as it were, meaning the ways in which we can engage with the existing premises and so move towards a possible solution. How do we handle the trouble *while being in it*, and how do we arrive at a new space of possibility? Crucially, we can draw on our experiences in arenas 1 and 2, which will prove decisive for dealing with the challenges in arenas 3 and 4. However, a key claim of this book is that in future design exercises, it is not enough to focus on how we manage the time-bound process of moving from A to B – that is, on how we *get out* of the trouble. We also have to pay attention to the ways in which, both individually and together, we can accept and acknowledge the challenges we are in – that is, how we can *be in* the trouble.

Again, it is useful to compare wicked problems to Morton's hyperobject. Hyperobjects have an incontrovertible reality that we are forced to confront. Morton says that hyperobjects are defined by their *viscosity* meaning that distributed hyperobjects such as global warming *stick* to all manner of localized events without fully residing in any of them. Climate change sticks to both the driver who fills up his car with petrol and the politician who holds forth in a debate about industrialized farming, and so on.<sup>70</sup> Likewise, when it comes to design, the climate and the environmental crisis stick to everything we do, all the way from arenas 1 to 4. We cannot remove our-

selves from the situation to contemplate it from without but must confront it constructively from within. Once again, however, it is not enough to accept the trouble: we have to use this acceptance as a springboard for new imaginations and visioning. In the following, I lay out the steps of a process leading from an awareness and understanding of the problem to new platforms of possibility and the mobilization of change. These are described as three steps called co-evolution of problem and solution, abductive serendipity and convergence and divergence.

## Step one: Co-evolution of problem and solution

Since the Scientific Revolution, we have been taught that when we encounter a problem, the most rational way of solving it is to split it into smaller parts, so that we can understand each aspect individually. *First* collecting data about the problem and *then* analyzing its possible causes and effects. However, as we have heard, when dealing with complex problems, this approach often produces endless datasets, subproblems and obscure relations between cause and effect – a messy situation from which it is almost impossible to take the leap to a possible solution, especially when it comes to giant-scale problems. By contrast, if we take a design approach to the problem, we do not prioritize a linear progression. Instead, we let the problem and the solution evolve in an interactive process. In practice, a design approach often begins to identify and understand the problem by trying to solve it. As we try out various solutions, the problem is refracted and reshaped, and so we come to see it in a new light. Even if none of the solutions turns out to be right, the process will still produce more knowledge and insight about the problem, which can help us improve our future attempts at a solution. An example from traditional product design would be the development of a new app. Here, it is only when we begin to sketch out the app

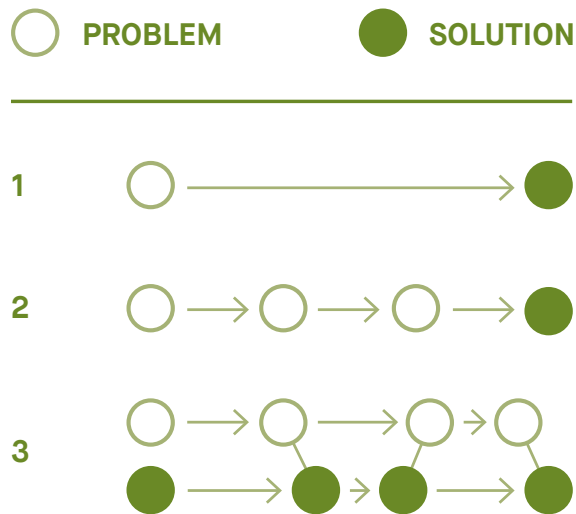


that we really understand how users will experience it. We can set out some basic requirements for what the app has to do, but the real design solution will only emerge when we sketch out how its functions will interact with one another and run trials to see how it works among the users and in the contexts for which it is being designed. Much the same can be said for large-scale problems like the COVID-19 crisis. There was no warning or preparation: it was only when we found ourselves in the thick of it that we could begin to explore possible solutions, such as various containment strategies, hygiene regulations, and economic stimuli. There was no time to thoroughly analyze the problem and draw up a detailed, step-by-step project description, consisting of sundry subproblems and solutions. We had to learn about the problem *as we were solving it*. There was no straight line from challenge to solution; but a messy process of trial and error, one that yielded many detours but also unique innovations of which some turned out to be highly effective.

Design theorists Keest Dorst and Nigel Cross describe the design process as a *co-evolution* of problem and solution, as the designers switch back and forth between defining the problem and exploring new solution spaces: it is the overlap between these two activities that constitute ‘the creative engine’ of the design process.<sup>71</sup> In other words, creative processes occur when one builds mental bridges to connect the problem and the solution space. These connections can be struck up throughout the process since the problem and the solution space continue to co-exist at every step of the design exercise. They co-evolve in an ongoing and mutual relation, affecting and adapting to one another in a transformative link, where each of their states is defined by the current state of the other.<sup>72</sup> Empirical studies of practising designers suggest they often reason backwards from a planned outcome to a possible design solution and then go back to reframe the problem when they suspect that the current design solution is inadequate. As Keest Dorst has suggested, this ‘reasoning pattern leads to the oft-observed phenom-



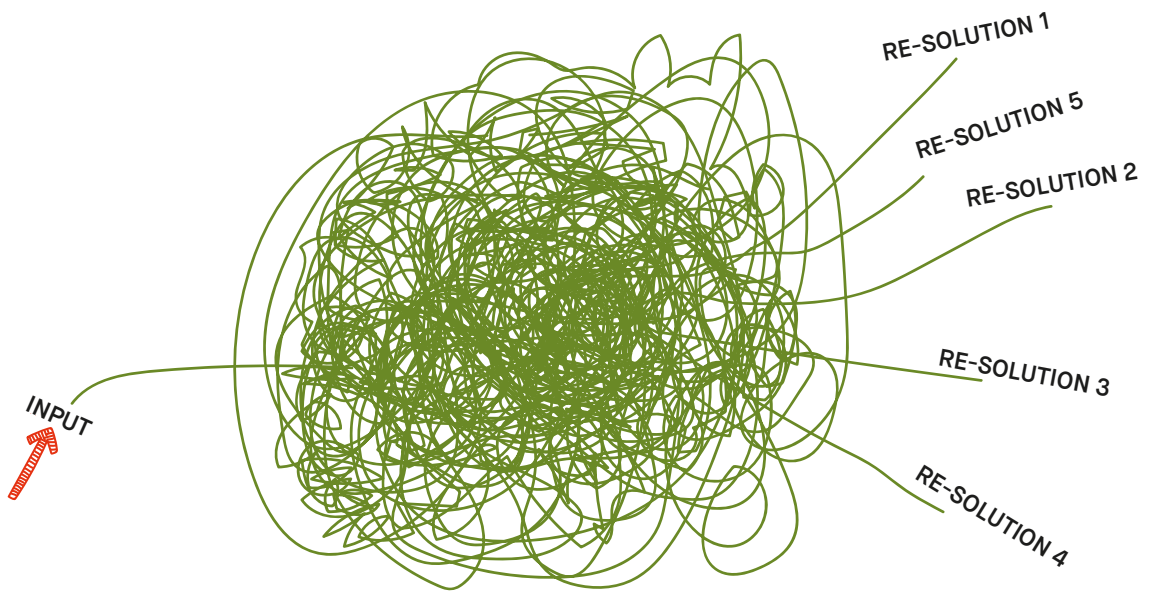
enon of designers “playing around” with ideas, tossing up possibilities (proposals) for frames, working mechanisms, and solutions in what may look like a childishly playful trial-and-error process’.<sup>73</sup> In this process, the problem is not fixed in advance but is brought into being as we search for a satisfactory solution. Design practices are thus as much about reformulating the problem as they are about generating proposals.



The graph illustrates three types of problem-solving processes: a process in which one moves linearly from problem to solution, a process in which new problems are discovered along the way, and a process in which one moves back and forth between problem and solution, allowing them to coexist and evolve through their mutual dependence. In the early stages of design method research, around

the 1960s, the ideal was to control the process and lead it straight from problem to solution. This is still the case in classic project management, but in later design theory, the focus shifted to understanding and handling the unpredictability of the design process, and the co-evolutionary approach – the third type of process – is now the most influential.<sup>74</sup>

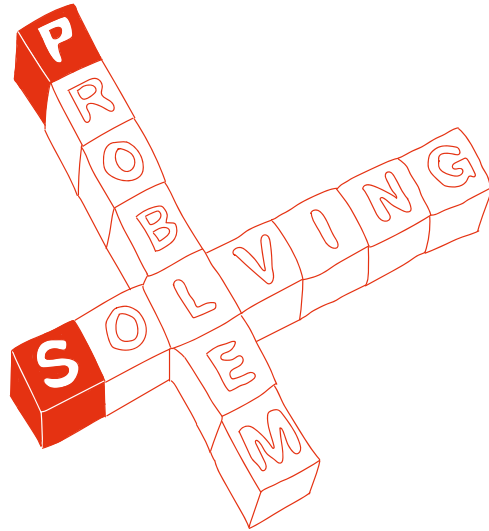
In *Frame Innovation*, Dorst explains that ‘solving problems nowadays is like trying to undo the Gordian knot in Greek mythology: whatever string you pull to unravel the knot, you end up in more of a jumble’. This is an apt description of a wicked problem: an open-ended, complex, continuously changing issue that generates five new problems for everyone solution that we find.<sup>75</sup> The doodle from VanPatter’s model of design is an apt illustration of wicked problems: as shown here, the knot consists of endless interwoven threads, and one cannot easily tell where each of them end or begin. In this illustration, there is also an input, in the form of a problem, a challenge, or an assignment, which can lead to many possible solutions. When it comes to wicked problems on the planetary scale, one challenge is that there is no clear goal that the entire human population can possibly agree on, meaning that it is difficult to step into the problem-solving space, let alone to solve them. In the case of COVID-19, there was at least an obvious target that we could all work towards – a global brief, as it were. We had to contain the virus and keep as many people as possible from dying. But in the case of climate change, we have only limited attempts at such a global brief, especially in the form of the Paris Agreement of 2015 or the United Nation’s sustainable development goals (SDGs), which lack the urgency and consensus that the containment of COVID-19 had. We must therefore attempt to handle the situation in all its fuzziness on the level of societies, organizations, and individuals.



Wicked problems as a mega doodle. The idea behind the concept of wicked problems is that these problems can only be solved through a looping process, in which one's understanding of the problem and one's ideas for a solution come about through a reciprocal interaction – allowing the designer to cut through the tangle of complications and come up with a proposal for a possible solution. The key aspect of

wicked problems is that they cannot be expressed through a simple, rational formula, and that their solutions will never be either right or wrong – though they can be more or less efficient. Whether the solutions are efficient will only become apparent when we test them by involving the users, contexts, and stakeholders in which they have to work.

Even worse than the fuzziness is the problem of *entanglement*: the enmeshment of countless circumstances in the problem, including our own actions, which brings us back to the notion of relationality discussed previously. Since we are ourselves entangled in the problem, we cannot take a bird's-eye view of the problem (as much classic design methodology implicitly assumes that we will), nor can we divide the problem into smaller parts. We must find new ways of operating in challenging relationalities, always keeping in mind both the overall perspective and the concrete challenge in front of us. To put it differently, our relationality and entanglement lead to great uncertainty as we try to tackle global problems like climate change, but importantly, they also invite us to take responsibility for what we create through design. It is not only a question of imagining a possible solution, but also of exploring new spaces of opportunity. We must investigate the possibilities and impossibilities that follow from each proposed solution, pursuing what may be termed the least of all evils.



The essence of design practice is that we only fully understand what the solution has to entail before we start working on the problem. That is by proposing and testing possible solu-

tions and eventually also continuously gathering insight to support, adjust, or reject those solutions, allowing us to move towards a final proposal.



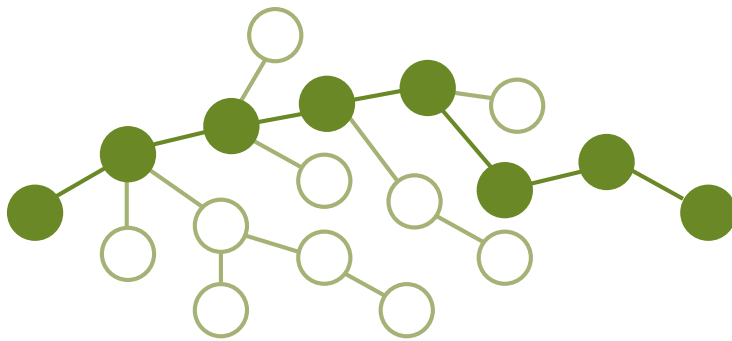
When we confront giant-scale wicked problems, we are like a traveller standing in front of a tangled forest, behind which lies a mountain whose top we occasionally glimpse. If the traveller is Steve Jobs and the mountaintop is the development of a new iPhone, the forest would be full of well-worn tracks, but also of obstacles that require him to cut new paths through the wilderness of problems and possibilities. But when we approach a problem such as the biodiversity crisis, we step into a thorny and entangled jungle, where few if any paths are ready for us. We have to continually cut our way through, and we will often come across unsurpassable obstacles that force us to turn

back and start over. To make sure that we are even headed for the mountain, it is crucial that we stop along the way to scale the trees around us and check our course: are we still moving towards the restoration of global biodiversity, or is it time to change direction? In the current geopolitical situation, where there is no global consensus about the right path ahead, the only way ahead is to begin to take this task upon ourselves as individuals and organizations: to scale the metaphorical trees that surround us, to connect with the larger whole, and to make sure that our decisions, how small and indifferent they may appear, still move us in the direction, we have laid out.



Design is a creative process, meaning that it requires sustained sojourns in the unknown and the unpredictable, in order to find a new way forward that feels right. Design theorist Nigel Cross refers to this process as ‘the leap of faith’, the point at which one moves into uncharted territory, guided only by an idea that feels worth pursuing.

For Cross, there is nothing mystical about this process: taking the creative leap of faith is fundamentally about letting the problem and the solution develop in an interactive process. The prototyping approach of design will make the challenges and possibilities more tangible, allowing us to see a way through the fog.



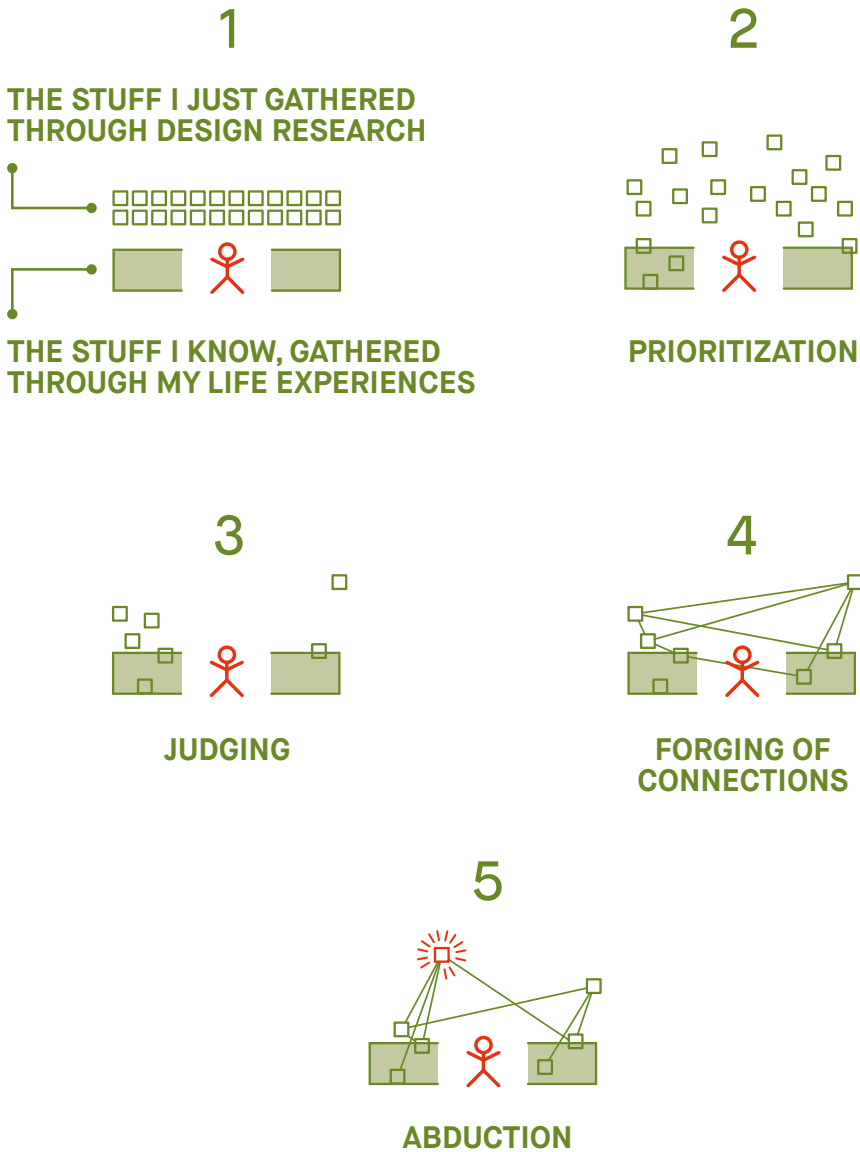
Working with wicked problems entails an exploratory approach, in which we remain focused *not* on whether the product we are working on will be successful, but on surrendering to the process itself, thereby making progress without knowing exactly where

we are headed. When we are in this exploratory mode, we have to keep going, to gain momentum, and to navigate without having fixed landmarks to follow. In short, the challenge of working with wicked problems is *how to move*, not *where to go*.<sup>76</sup>

According to design thinking studies, the ability to dwell in the unknown is itself a cognitive skill, and many design theories seek to cultivate and strengthen this skill. Design thinking has been described as a particular kind of *cognitive style* that allows us to be present in the creative process and simultaneously reflect over what is happening – a ‘reflection in action’, in the words of the philosopher and sociologist Donald Schön.<sup>77</sup> This reflection takes place in dialogue with the given material or situation that we are working with, be it the clay of the ceramicist’s cup responding to the pressure of the hands, or a skilled design facilitator’s sense of being on the right track toward a new strategic initiative.

A central concept in design cognition is *abductive thinking*, which is a way of navigating the unknown and working with problems and solutions in an interactive process. Simply put, an abduction is a form of qualified or educated guesswork.<sup>78</sup> The concept was coined by the philosopher Charles Sanders Pierce, who used it to describe a form of common-sense assessment that is not based on logical thinking as much as on experience and gut feelings.<sup>79</sup> The abductive approach thus stands in contrast to the traditional approaches of scientific thought, namely induction and deduction. In induction, one generalizes from a series of observations to a hypothesis about a given phenomenon. In deduction, one makes inferences about a particular case from a general, widely accepted hypothesis. In design, we can use both inductive and deductive approaches to produce new knowledge, but design studies often point to abduction as the key moment in the design process, because it constitutes the very moment in which ideas or hypotheses are generated to begin with. It is a *thinking move* that springs from such impulses as ‘What if?’ or ‘Might it be that...’ This form of thought exists in all fields of knowledge and can be practised by anyone. In design thinking, whether carried out by professional or non-professional designers, it is most





In design, abduction is a form of thought that combines divergent and convergent approaches in a single non-linear *thinking move*. Both analytic competences and intuition are brought into play at once. As shown here, design theorist Jon Kolko has drawn a schematic representation of his own abductive process: “The illustration oversimplifies this process

for clarity; the actual process is not linear, nor is it as “clean” as shown’, Kolko explains.<sup>80</sup> When it comes to handling giant-scale complexity and wicked problems, the intuitive and the unconscious are often indispensable assets in our movement through the complexity field of design, as they expand the narrow bandwidth of analytical linear thinking.

closely associated with the proposal-making stage, and it is often accompanied by a prototyping activity in which these proposals are given concrete form.

As in all other exploratory activities, in the design process, it sometimes happens that we find something we weren't consciously looking for. This kind of serendipity can be both a deliberate strategy and an accidental boon, and it is especially useful when we are navigating the unknown. In an explorative process, we can move through various fields of possibility, stop to examine a given space without a set goal in mind and suddenly notice a new possibility. The precondition for making such serendipitous finds is that we learn to both dwell in open spaces of possibility and to use the input, data, and stimuli that we stumble upon. We may get the sense – through our previous experience or simply gut feeling – that the serendipitous find is a promising direction that we should pursue.<sup>81</sup> The focus on serendipity in design thinking encourages trust in the contingent and the accidental. Through abductive thinking, we come up with qualified proposals for a solution, but to get these proposals to work, we have to really believe in them and pursue them.

## Step three: Convergence and divergence

A central notion in design theory is that, in order to work with the problem and the solution in an interactive process, we must switch back and forth between different kinds of mindsets and modes of action. These mindsets are tied to different phases in a typical design process. In early depictions from the 1960s, design processes were typically seen as step-by-step progressions, with a linear movement from the problem to the solution. One such depiction is John Chris Jones' model from 1970, which consists of three phases: Analysis, Synthesis, and Evaluation.<sup>82</sup> These three phases became a common

foundation for later descriptions of design methodology. Their names might change, and each phase might be subdivided into other phases, but the overall picture remained the same. However, the models based on linear process did not match real-life design processes. For one thing, the collection of too much data in the first phase tends to uncover endless chains of cause and effect, revealing countless new problems. Even worse, the linearity of the model does not allow the process to shift back and forth between phases. If, for instance, the design team discovers that an assumption is wrong, they will have to adjust their assumptions or collect new kinds of data in order to move forward.

1. ANALYSIS	2. SYNTHESIS	3. EVALUATION
1.1 GENERAL LIST OF FACTORS THAT AFFECT THE PRODUCT AND ITS REQUIREMENTS	2.1 CREATIVE THOUGHT PROCESSES	3.1 METHOD OF EVALUATING THE PRODUCT
1.2 CLASSIFICATION OF FACTORS	2.2 PARTIAL SOLUTIONS	3.2 EVALUATING PRODUCTION OUTPUT AND SALES
1.3 SOURCES OF INFORMATION REGARDING THE DESIGN	2.3 COMBINATION OF PARTIAL SOLUTIONS	
1.4 INTERACTION BETWEEN FACTORS	2.4 OVERVIEW OF POTENTIAL SOLUTIONS – DECISION-MAKING	
1.5 SPECIFICATION OF REQUIREMENTS FOR THE DESIGN		
1.6 REACHING AGREEMENTS BETWEEN THE INVOLVED PARTNERS		

In his ground-breaking study *Design Methods*, John Chris Jones introduced a new method for systematic design. Jones sees the fully rationalized design method as a process consisting of three steps: 1. *Analysis*: Brainstorming and formulating the relevant information, demands and

factors, reducing these to a set of definable characteristics; 2. *Synthesis*: Determining possible solution models by connecting ideas from the analysis stage. 3. *Evaluation*: Evaluating how well the proposed solutions meet the demands of production and sales; choosing one solution.

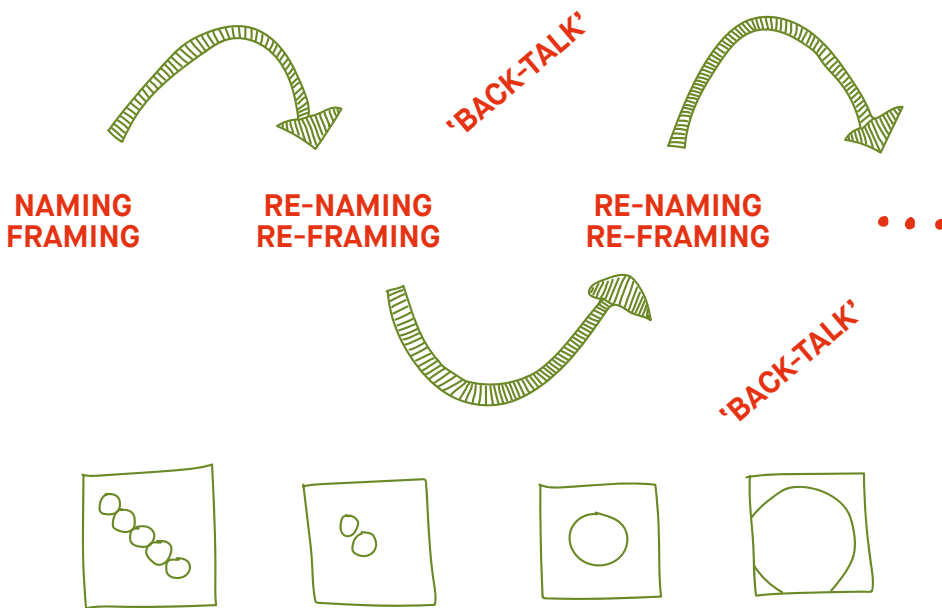
Later models have integrated the possibility of iterative and looping processes that allow for a dynamic relation between the problem and its solution. These iterative models are often termed second-generation methods.<sup>83</sup> In the 1980s, Bryan Lawson introduced an almost deconstructed phase model. Lawson sees the relation between phases as dynamic, with each phase containing the typical components of an entire design process: problem, analysis, synthesis, evaluation, and solution. The key point of Lawson's model is that the design process varies dramatically depending on the situation in which it takes place, as the various phases or modes of action can be combined and executed differently depending on the context.<sup>84</sup> With this in mind, the idea of developing prescriptive or universal models for design no longer makes sense. Working with design processes is thus about getting to know the typical components and ways of working to the point where each *modus operandi* is fully internalized, so that you can facilitate processes that involve others. Dynamic models which subvert hierarchies, put practice before methods and focus on the design situation and the designer, have been labelled third-generation methods.

As a part of the same movement, Donald Schön focused on the dynamic and unpredictable design situation, describing it as a dialogue. For Schön, the process is a series of moves that do not refer to a predefined phase in a process, but to an ongoing, iterative activity. Moves are small-scale actions that affect the material at hand, changing the situation and so generating a new state, through what Schön terms the *back-talk* of the material with which we are working. Together, these moves form a *course*, and the material back-talk they generate allows us to see the situation more clearly and so adjust our course, in an ongoing conversation that allows us to rethink, refine, and reframe our ideas and so move in a new direction. This way of seeing the design process is in line with the points we have already made on dynamics between problem and solution and abductive serendipity.



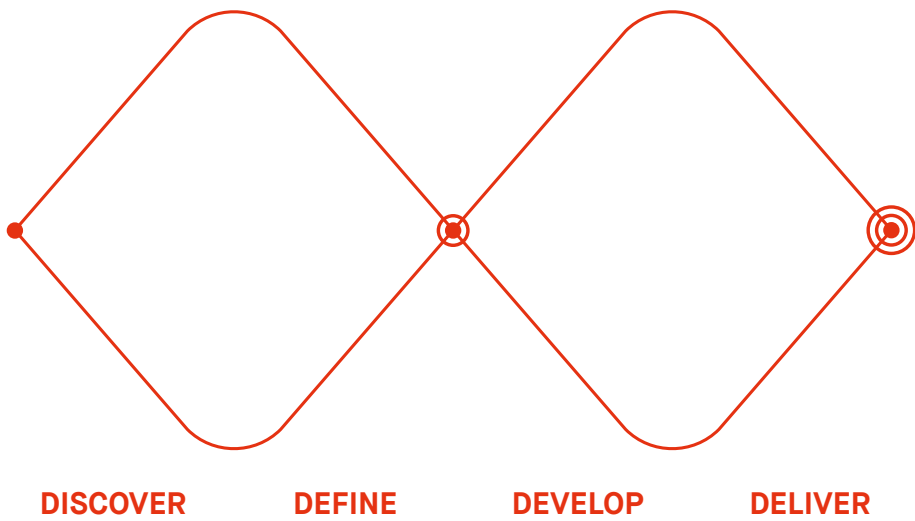
Design theorist Bryan Lawson describes the design process with a deconstructed block model, where each block represents a mode of action. The key point of this model is that the design process cannot be translated into a simple linear formula. For designers and facilitators of design processes, the goal is

simply to become familiar with the various components that usually make up the process, and then practice how to *be* in each of them. This kind of familiarity makes it easier to handle unpredictable situations and lead oneself and others through the various phases of analysis, synthesis, and evaluation.<sup>85</sup>



According to Donald Schön, the design process is an almost hermeneutic activity, as it begins with the identification of a challenge: the *naming* and the *framing* of the situation. The situation will then respond to the designer's identification of it, through a process that Schön calls *back-talk*. This leads the designer to a new reflection – that is, a re-naming and re-framing. This in turn leads to new

back-talk, and the process is repeated until the goal has been achieved. In the context of large-scale challenges this model can help delimit options, clarify intentions and set out a direction through the field of complexity, in the form of an ongoing naming-and-framing process in which prototypes are used to give concrete shape to our ideas.



The Double Diamond model describes the typical phases of divergence and convergence in design, which are repeated twice in a four-step process: *Discover*, *Define*, *Develop*, and *Deliver*. In this model, we first uncover the problem or field

of possibility (Discover), then begin to delineate the concept that we are pursuing (Define), before testing and optimising the concept (Develop), and finally producing and presenting it (Deliver).<sup>86</sup>

In recent years, design theorists have followed the leads of Lawson and Schön in examining the mindsets designers switch between in the design process. Designers typically switch between an open and explorative mindset and a mindset of decision-making. In design studies, these mindsets are labelled *divergent* and *convergent*.<sup>87</sup> One popular account of the design process of divergent and convergent thinking is the Double Diamond model, developed by the British Design Council. Here we see two successive rounds – or ‘diamonds’ – of divergence and convergence around the concept under development. The Double Diamond model expands the three phases in Jones’ original model and ends up with four phases each with its own mindset: *Discover*, a phase of divergence in which many possibilities are explored, *Define*, a phase of convergence where the concept is delineated and defined, *Develop*, a new phase of divergence in which it is tested and optimized and *Deliver*, a final phase of convergence and refinement leading up to the delivery of the final product.

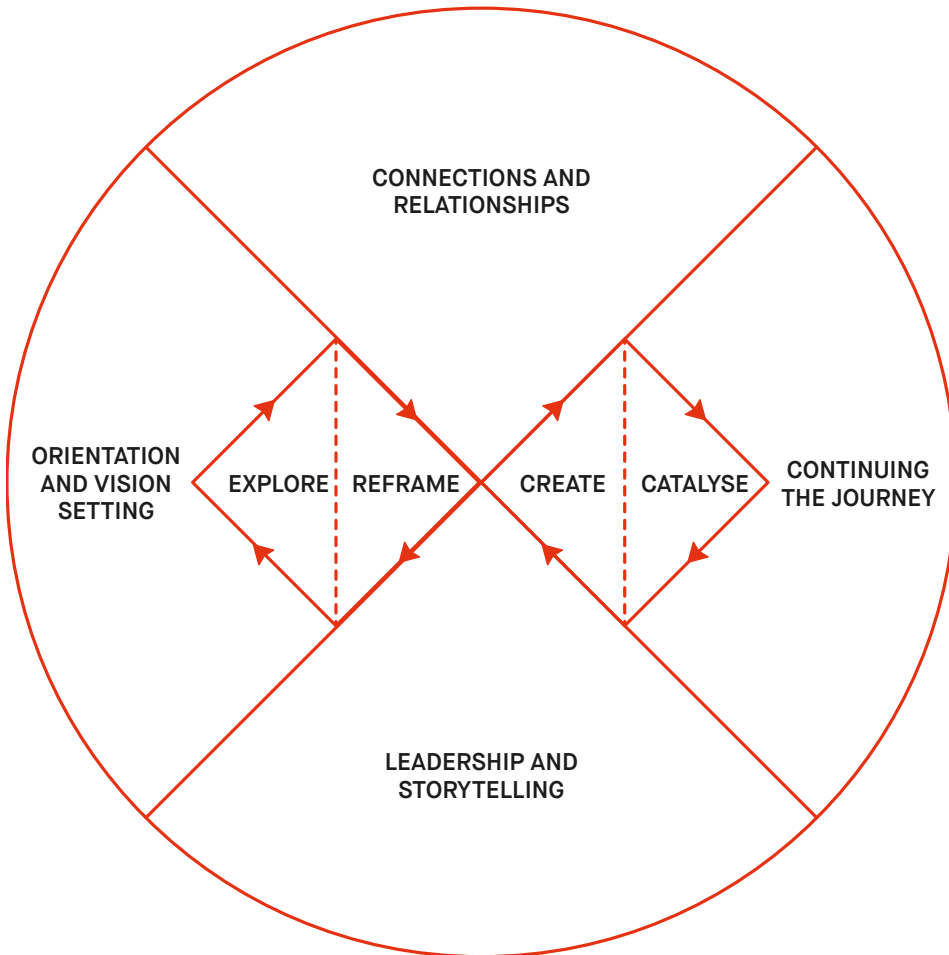
However, though the Double Diamond model seems to describe a linear path, with one phase leading neatly to the next, the model relies on the important premise that one can move back and forth between the phases at will. Further, it is explicitly focused on which mindsets belong to each phase of the process. The Double Diamond could be called a fourth-generation model, as it is characterized by iterative loops between phases, by the switch between mindsets, and by the close relation between understanding the problem and creating the solution. Contemporary design theory is centred on the abductive mindset, the dialogue between problem and solution, and the recurring shifts between divergence and convergence in the design process.<sup>88</sup>

These approaches have a lot to offer when working with the huge and complex challenges we currently face. Using design methods allows us to handle challenges in solutions- and prototype-oriented ways. On the other



hand, design methods tend to pay little attention to the broader context of politics, society, international relations and the like. This is all the more remarkable since any large-scale design processes depend on these kinds of outside forces, which also influence the process all the way from initiation to realization.

In a new version of the Double Diamond model released in 2021, the British Design Council reacted to the urgent challenges to society and the environment. Their updated process model, *Beyond Net Zero – A Systemic Design Approach*, lays out a new agenda for design and design studies. The title refers to the ‘net zero’ goal, meaning a perfect balance between the amount of greenhouse gases that are released into and removed from the atmosphere. To achieve this goal and move beyond it, British Design Council calls for a systemic and holistic perspective in design and design studies, updating the Double Diamond model to reflect this change, in what might be labelled the fifth generation of design methods. In addition to the four phases of divergent and convergent mindsets, the Double Diamond model now includes four different contexts for design processes, with each context highlighting different aspects of the design process and putting it in a bigger picture. The four contexts are as follows: (1) the vision and orientation, (2) the relations and connections, (3) management and storytelling, (4) journeying beyond the end of the project. The core of the Diamond Double model is still the divergent and convergent phases, now labelled Explore, Reframe, Create, and Catalyze. But the model introduces a new systemic element: all the four phases take place in a continuous dialogue with their respective contexts, which inform and influence the outcome of the process. The change to a systemic perspective highlights the interconnected and complex nature of the challenges we face today, and the need to prioritize ‘the planet as well as its people’.<sup>89</sup>



The British Design Council's Beyond Net Zero Design process model reflects the need to focus on the intentions, connections, communication, and leadership of design processes.

This focus is sorely needed if design is to play a major role in solving the challenges facing our societies and the environment.

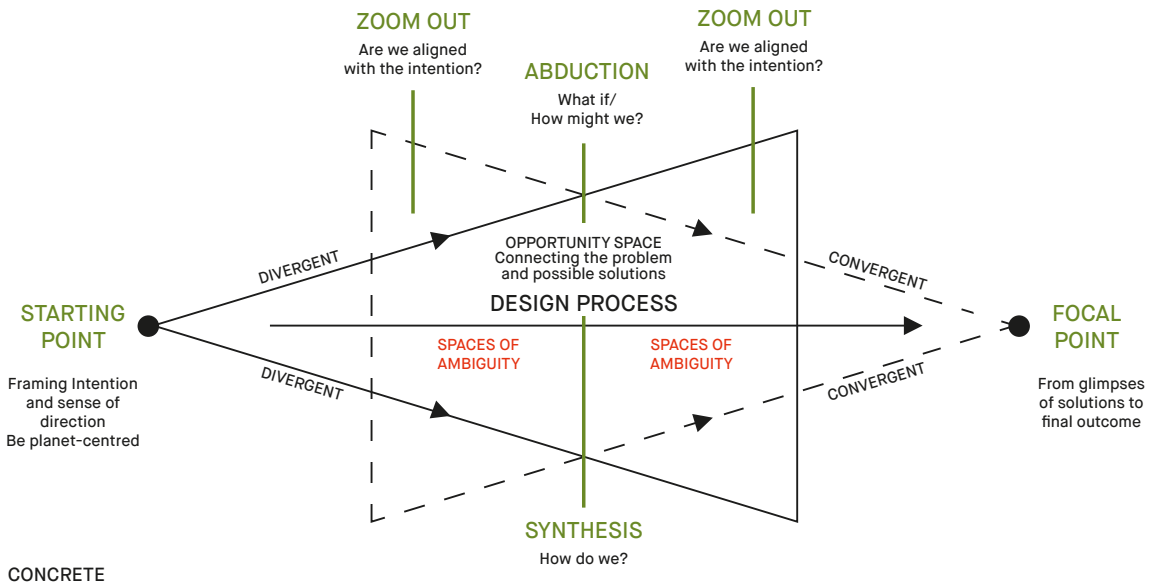
The first context is the orientation and vision-setting of the design process, and the British Design Council suggests that these should be so ambitious as to ‘radically ... rethink our world’.<sup>90</sup> Instead of working in a traditional loop of problems and solutions within a short-term horizon, designers should begin with ‘a hopeful vision of what we want to achieve, and develop a clear mission from that’.<sup>91</sup> During the design process, this vision should be ‘shared across partners and with stakeholders’ and aligned with them. British Design Council does not specify who should frame the visions at the outset of the process, but notes the importance of working ‘together to achieve a sustainable, fair and just society’.<sup>92</sup>

The model’s second context is about leadership and storytelling. The British Design Council stresses the importance for leaders to ground their visions in values and to create visions that can be ‘carried out at all levels, from their own actions including finding and sharing stories to influence and inspire the wider system’.<sup>93</sup> This links to the next context: connections and relations, which according to the British Design Council calls for systemic design work, a perpetual endeavour that demands ‘tenacity and hope’.<sup>94</sup> Connections and relations are about ‘building empathy and bringing in the perspectives of all involved in the work: stakeholders, communities and mother nature herself’. The fourth context is termed ‘continuing of the journey’: design is a process and a dynamic system, meaning that our work is never fully done. It is therefore pivotal to keep learning and reflecting upon our success as well as our failures.

The Double Diamond has become a common ground for many design theorists and professional designers, and my aim in this book is aligned with the British Design Council’s updated model. But I would also propose to go both higher and deeper in the directions set out by this model. The new Double Diamond highlights the importance of reframing projects through orientation and visionsetting: this is to be done both at the beginning of

the project and along the way through a constant alignment whenever new questions, challenges, or relations come into play. While this is clearly important, it is often the case that the orientation is focused solely on the needs of the client or the dynamics of the design team. Here, I would propose that vision-setting should specifically aim at a higher perspective, focusing on the planet and on our species. The end goal in a traditional design setting is to go from an abstract and exploratory state to a concrete and specific solution. The gaps between the requirements of a brief, the visionary abstraction of the initial phase and the concreteness of the concluding phase can seem insurmountable. It is therefore particularly important that the exploration of the abstract space of possibilities should be guided by a clear intention and direction, and that this direction should lend momentum, leadership and engagement to the subsequent phases of development and decision-making. This sense of direction can help us endure the complexity and challenges of the design process, ensuring that both the exploration of new possibilities and their gradual narrowing and evaluation are guided by an overall principle, formulated through a strong vision-setting.

## ABSTRACT



## CONCRETE

'Get on top' of wicked problems. As a summary of Chapter 2 the extracted model illustrates the typical components of a design process. The argument is that mindsets and methods from design and design thinking can help us work with complex challenges by offering approaches that make it easier to remain in spaces of ambiguity, uncertainty, and hyper-complexity – in the chapter described as committing us to the trouble while at the same time exploring possibilities and proposals for solutions. The model describes a design process leading from a starting point of framing by intention and setting direction to a focal point, spanning from glimpses of possible

solutions to outcome. Between the two points are spaces of ambiguity and complexity and the suggestion that they can be handled through dynamic iterations between convergent as well as divergent thinking and doing. Given the goal of this book the suggestion is that every design process must be guided by a clear intention and direction from the onset and throughout. This requires pauses along the way to check the course, to metaphorically climb up in the highest tree to make sure that the decisions still move the process in the direction that has been laid out.

In the next chapter, I look deeper at how different forms of *framing* can help us work with complexity as a precondition of the design process, by framing and reframing the challenge and its possible solutions in an alternation of what I have called *zooming in* and *zooming out*. The British Design Council use similar concepts, but for them, zooming in and out has to do with moving between micro- and macro-levels in a design process, ‘from root cause to hopeful vision, from the present to the future, from the personal to the wider system’.<sup>95</sup> I use the idea of zooming out to describe the radical broadening of perspective to include the whole planet and the multi-species-perspective of our decisions. My argument is that this should be our real perspective, and I will argue that a fully zoomed-out perspective also aids our vision-setting and makes it easier to make decisions at the micro-levels of design.



We have looked at the typical components of the design process and seen how designers think and create. We have introduced the concept of wicked problems as a way of approaching the mega-challenges we face. The mega-challenges can also be described as hyper-objects, massively distributed in time and space relative to a human perspective. This massive distribution makes the problems difficult to grasp, but the techniques used in design can help us to approach them and reach a point where we can come up with proposals for possible solutions. This is achieved by letting problems and solutions work together in the process; by a devotion, adherence, and openness to the possibilities that present themselves in the constant looping dialogue with the material or situation; and last but not least, by having a clear intention and direction about where we are going.

## The road so far: Milestones

### *From analysis by division to proposals by synthesis*

Design represents an alternative to the traditional way of working with problems in project management, which is focused on understanding the problem in depth before coming up with solutions. This linear approach makes it difficult to leap from problem to solution, and as a consequence, one often ends up reproducing existing solutions. By contrast, a designerly approach would allow problems and solutions to co-evolve in a looping process with divergent and convergent approaches and constant prototyping. The design process more often leads to unexpected possibilities and innovative solutions. By using design methodology in combination with a strong orientation, we may end up finding out where we are going.



We face great challenges, but it is my claim that we do not need more knowledge about them: we need action. We need to begin to confront the challenges. In that process, we will not be able to grasp their full complexity. They will continue to be wicked. But the designerly way of working with solutions as a way of understanding the problem will get us started, and our vision will keep us on track.

*As our collective skills and knowledge have grown, the inevitable response has been to divide our shared body of knowledge into much narrower domains, consigned to silos of expertise [...] we have become a society of specialists, each with their own language. However, with greater depth of knowledge comes a lack of breadth or ability to see outside of the silo. Rather than working together, specialists have become the proverbial blind men arguing over an elephant: Is it like a wall, a rope, a snake, or a spear? Each is convinced of the primacy of their perspective; all are unable to perceive the other pieces and put together the bigger picture, or even have the language to articulate themselves to each other [...] I would argue that the wisdom necessary for a wise future does not just lie in knowing. Wisdom lies in the ability to take disparate pieces of knowledge, sometimes incomplete, and see a bigger picture.*

– Rafael Ramirez et al.<sup>96</sup>

# Chapter 3. Zooming in and Out. What Is Our Perspective?

In Chapter 2, I have sketched out a process of design in three steps. The first step, ‘problem and solution co-evolve’, is about clarifying the problem in all its complexity and seriousness and exploring the given possibilities and constraints. The second step, ‘abductive serendipity’, is about discovering the potential and the hidden promises that can be found within seemingly insurmountable problems. These two steps kickstart the third step, namely the alternation of divergence and convergence, which forms what one may call the respiratory cycle of design – the breathing in and out of the creative process.



In this chapter, I present a model for how to reframe the difficult situations that we are facing in two main ways, which I call *vertical* and *horizontal* zooming. These two perspectives help designers and participants in the design process frame the planet perspective, what I in the previous chapter called framing the intention and setting the direction. In my definition, the vertical zooming is focused on the spatial perspective, and especially on our sense of scale. It is about consciously considering the level on which we are treating the problem, all the way from the macro-perspective of a planetary level to the micro-perspective of concrete proposals and suggestions. The horizontal zooming is focused on the temporal perspective. How far into the future are we thinking when we consider a possible solution: three-to-five years or three-to-five generations? In the design process, the vertical and horizontal perspectives have to be mutually interconnected. Throughout this chapter, as I explore ways of reframing the problem, I will also sketch out the various situations that we encounter in the three steps of problem-solving that I described in Chapter two paying close attention to how they unfold in time and space.

## Vertical and horizontal zooming: From micro to macro

The notion of vertical and horizontal zooming is informed by what is known in design theory as *framing*, that is, the determining of which features, aspects or circumstances will be taken as relevant to the design process. Keest Dorst describes framing as part and parcel of the domain of design, though of course it is found in many other fields too.<sup>97</sup> According to Dorst, a crucial element of framing is the choice of a ‘what’ and a ‘how’ for the process: given that, in design process, the process and the solution are insolubly linked, the ‘what’ and the ‘how’ will likewise be mutually dependent and will have to be developed in tandem.<sup>98</sup> Another central aspect of framing

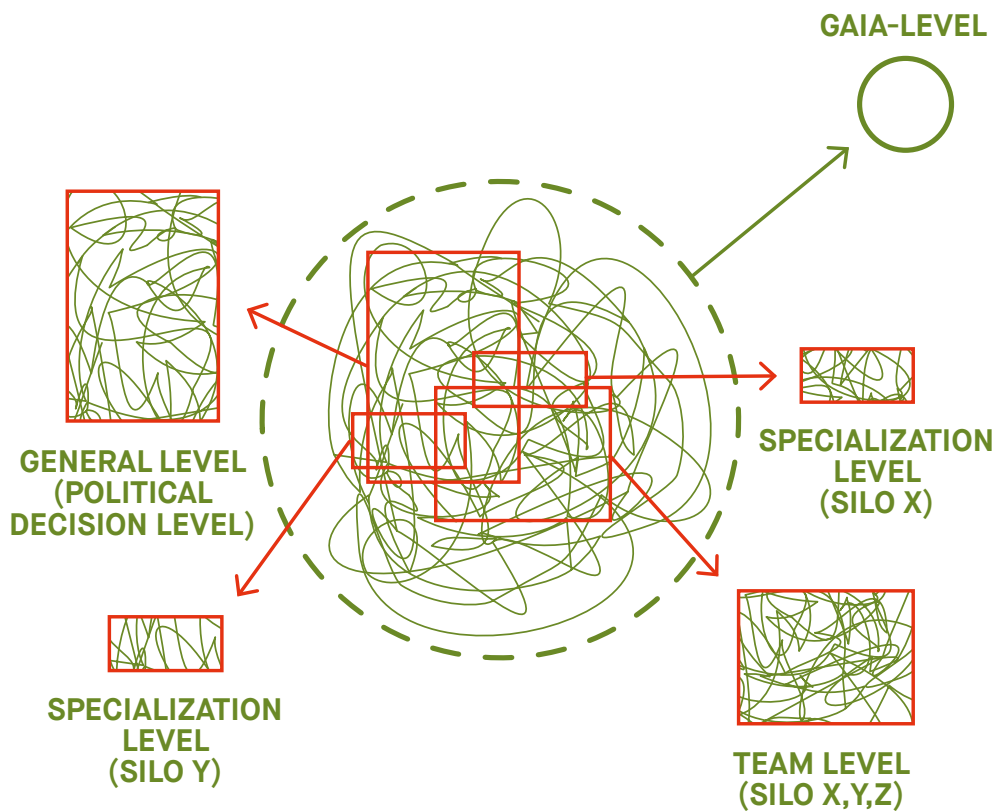
is to make oneself aware of the perspective from which the problem is being viewed or the context in which it is being studied. Through such awareness-raising practices, it becomes possible to *re-frame* the problem, that is, to take a step back from what seemed like an impossible challenge and place it in a new frame, in which it may become easier to solve. Dorst refers to this stepping back as *zooming out*, similar to the notion of divergent thinking explored in the previous chapter. When it comes to the framing of a problem, divergence may mean moving to a higher level of abstraction, so as to step out of a concrete planning-and-problem-solving mindset and instead deal with the situation on a more general level, as a complex series of interconnected challenges.

If we take the case of plastic in the oceans. This wicked problem can be framed through countless perspectives and levels of abstraction. For example, the problem can be viewed through the lens of a single discipline, such as biochemists researching biodegradable alternatives to traditional plastic materials. Alternatively, it can be tackled with an interdisciplinary approach, such as a team of specialists developing new systems for collecting the existing plastic in the water. Or it can be approached on a political level, either nationally or globally, such as politicians introducing new restrictions for the use of plastic containers or assigning more funds to the research and development of more sustainable containers. What these degrees of specializations and levels of abstraction have in common is that no single one of them has a complete view of the entire problem. Even as they are all working on the same challenge, they are not necessarily aligned with one another or with what must be done on a planetary level to take care of the oceans, the fauna, the flora, and the human race.

The situation resembles the famous story of the elephant and the blind men. Each blind man can only sense a part of the animal, the larger whole escapes him. And together they can't agree on what they are facing. However, with

the challenge of plastic in the oceans, even those who are aware of the larger problem have a tendency to accept the status quo out of complacency or laziness – drinking water from plastic bottles and not from the tap, for example, or buying a new plastic bag instead of bringing a used one, and so on, until the environmental challenge builds up to unsustainable dimensions. If we zoom out to a planetary level and look at our globe from the outside, we see that the Earth has no magic tubes or worm-holes through which plastic, CO<sub>2</sub> or other human-made remains could disappear into space. Plastic has nowhere to go, and so it unavoidably ends up in the sea or inside animals and humans. In 1960, 5 per cent of sea birds were found to have fragments of plastic in their stomachs – today, that number is 90 per cent.<sup>99</sup>

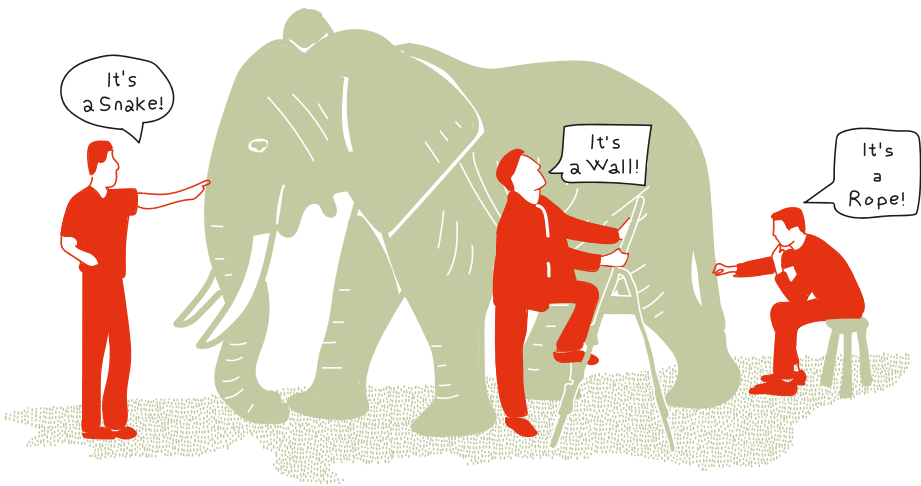
When we first saw the picture of the ‘Blue Marble’ taken by the Apollo 17 expedition in 1972, we were confronted with the fact that most of the planet’s surface is covered by water. But fifty years on, we have yet to really understand that most of the plastic we throw away ends up in the ocean.<sup>100</sup> We have been overly caught up in our siloed-off perspectives and patterns of thought, and we have forgotten to zoom out to a larger perspective. Of course, we have developed many solutions for recycling plastic, and still more plastic waste is now being reused. But in the grand scheme of things, only a small percentage of the world’s plastic production ends up being recycled, and we have yet to solve the massive problem of cleaning up after the already inflicted damage – not least in the pernicious microplastics that are almost impossible to extract from the sea.



The challenge of wicked problems like plastic in the oceans is that it is impossible to *both* view the entire problem in all its complexity *and* solve a particular aspect of the problem at the same time. The model shows examples of specialised areas of knowledge and various degrees of siloing, from the hyperspecialized research groups investigating material technology over interdisciplinary teams of, for example, NGOs, to the

general political level. The various levels cannot do much on their own. Therefore, to make sure that they are working together, we need to employ a planetary perspective at all levels of decision-making. My claim is that this kind of perspective can only be achieved through a continuous shift in zoom back and forth between the detail and the globe – whether we are operating on the individual, the organizational, or the supranational level.





The story of the blind men and the elephant is found in many versions across Buddhist and Hindu thought. It illustrates the limitations of our perception of reality and the importance of setting our knowledge in a

larger context. In the modern world, our challenge is that the increased speed of production and specialization of knowledge have destroyed our understanding of the elephant that we ourselves have created.

When zooming in and out on a wicked problem, it is worth keeping in mind that the problem's degree of complexity depends on the level of zoom from which one sees it. When we zoom in to the atomic level, we are dealing with a manageable amount of information, such as a list of chemical elements and compounds. The further we zoom out, the greater the complexity becomes until it approaches unmanageable proportions. But when we zoom out all the way to the planetary level, we arrive at a new sense of simplicity – not in the form of concrete solutions, but through our very awareness that the problem is unacceptable and that it will not go away on its own.

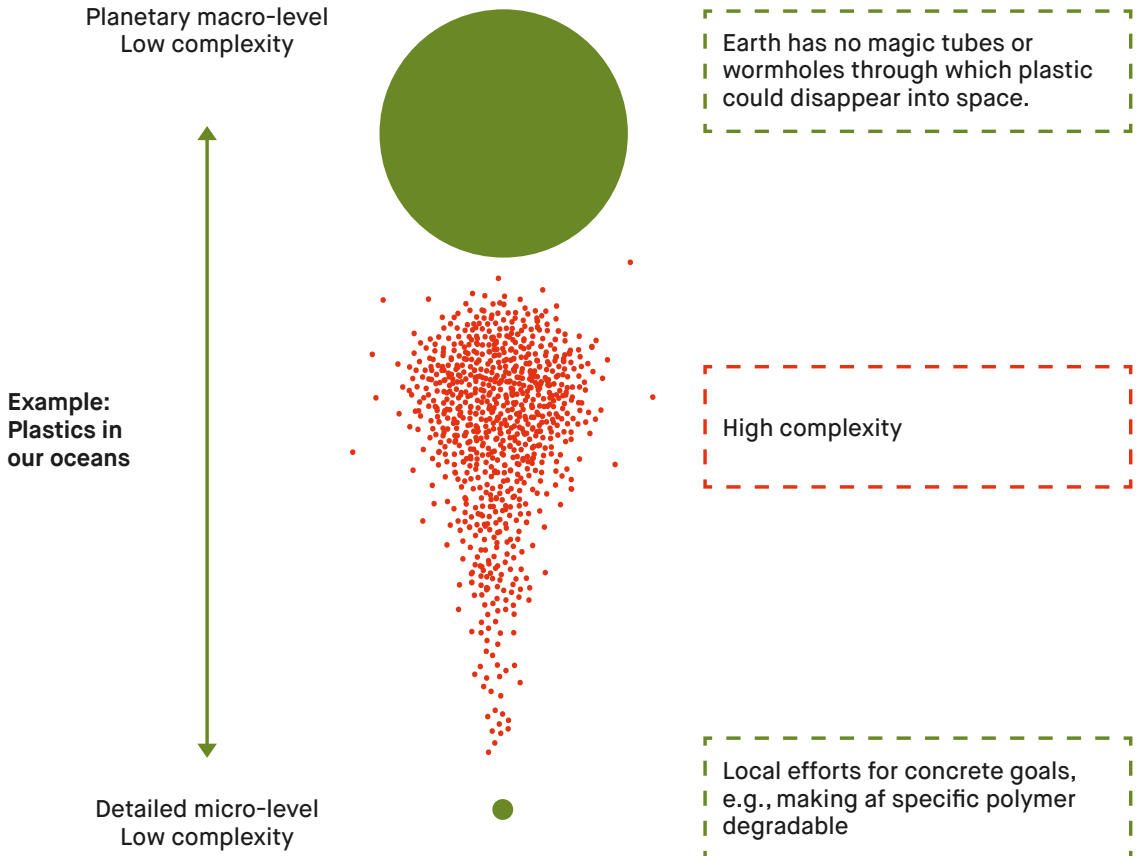
In theory, this zoomed-out planetary simplicity should result in the same global consensus and resolute actions that we saw in connection with the COVID-19 crisis. If this is not the case (or not *yet* the case), that is presumably because illness, death and the collapse of the hospital system is something we can all relate to in concrete and tangible terms, whereas the degradation of the ecosystem, the reduction of biodiversity, and vast islands of plastic floating around in far-away oceans are still too abstract for us to urgently engage with: they are hyper-objects in the term of Timothy Morton that are distributed across time and space and cannot be encountered directly. Further, the difference between the response to COVID-19 and to the climate crises may also reflect the human-centred mindset that has been the hallmark of our species so far. Our implicit motto has always been: 'Humans first!' We turned society upside down to protect the sick and the old – and that was a beautiful and humane thing to do, no question about it. But if we zoom out to a planetary perspective, we can ask whether it is really wise to ignore all problems except our own short-term survival?

Contrariwise, if one cannot begin to solve the problem or find ways of engaging with it, then one has not zoomed in far enough. To solve a planetary wicked problem, we have to be able to zoom back and forth, in and out as the

situation calls for, both focusing on detail-level challenges and making sure that the proposed solutions are moving us in the right direction on the global scale.

If we apply a micro-perspective, we can find many possible solutions – fewer plastic bottles and bags, for example – but we cannot tell how these solutions accord with the long-term effects of our behaviour. On the other hand, if we apply a macro-perspective, we have no sense of the material at hand, so we cannot move towards new concepts and ideas. Dealing with wicked problems thus means moving back and forth between different framings. Overall, one might argue that traditional and industrial forms of design have developed effective ways of zooming *in* on a problem, but we still lack the ability to zoom *out* to the planetary frame from which we can see the global challenges ahead and coordinate our efforts accordingly.

In our work, we are often caught up in a siloed perspective, either the structure of our organization, the department of our company, the specialisation of our field, or the knowledge of our discipline. Add to this that our efforts are usually determined by specific interests – individual, organizational, and national priorities – and the result is a messy, conflicting, and often counterproductive mishmash of endeavours. This is not a problem that can be easily solved, but we do need a concrete tool to help us zoom in and out, so that we can gain a better sense of perspective and so align our efforts more constructively. This is truly also important if we consider our general time perspective. Indigenous people are known to consider decisions in the perspective of seven generations. How would our politics and daily lives look like if we did the same? Zooming out in the time perspective is not just about looking at the planet right now, but also about considering how our actions now will reverberate in time. Zooming will force us to consider circularity and not just linearity, from the finite to the regenerative. What will we leave to those who come after us? How do we parent and nurture?

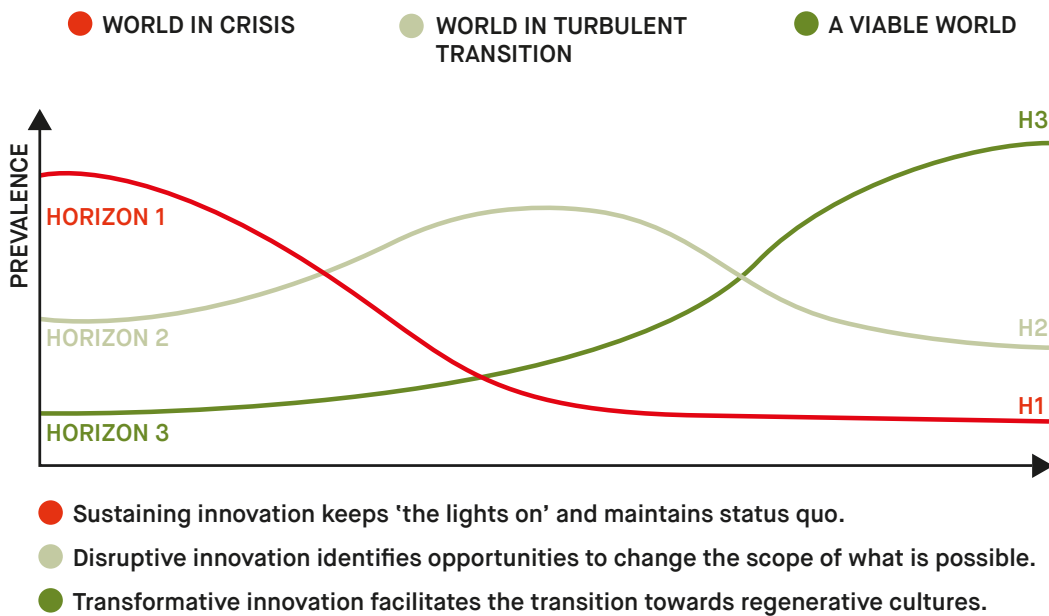


This model elaborates on the zoom-in and zoom-out in time and space with a focus on the idea that a problem's degree of complexity depends on which level of zoom we conceive it from. If we look at the former mentioned challenge of ocean plastic pollution, we can zoom in to an atomic level. Here we are dealing with a manageable amount of information, for example when the chemical engineer is engaged in making a specific polymer degradable. If we zoom out the com-

plexity raises and continues to do so, but at a certain level it implodes to a new unity - the globe. The different levels do not facilitate specific solutions but suggest a thought model to raise awareness of the fact that even though plastic bottles are out of sight when they are thrown out, they continue to be out there, and as the globe is a closed system, they will eventually over years end up in our own and our descendants' bodies.

Besides the suggested framework of zooming in and out on a micro- and macro-level, a framework to enable temporal zooming out could be Daniel Christian Wahl's adaption of futurologist and system-thinker Bill Sharpe's *Three Horizon-thinking perspective*. In Wahl's book *Designing Regenerative Cultures* the Three Horizon-thinking perspective is a framework to the transition towards a regenerative culture. In the framework, First Horizon thinking represents the systems that are currently prevalent, characterized by 'sustaining innovation' that keeps 'business as usual' going. Third Horizon thinking represents a vision of a 'viable world': not a detailed plan, but dreams, intuitions, emerging aspirations, and patterns of hope. Second Horizon thinking represents a 'world in transition', that is, the entrepreneurial or creative space of already feasible innovation that can disrupt the First Horizon thinking and potentially show a way forward towards the Third Horizon. The core lesson of the model is that we cannot arrive at or maintain a Third Horizon scenario forever. Moving towards the Third Horizon will always entail acknowledging stages of uncertainty and 'not knowing', but it can be helpful to stretch our thinking and embrace both short-, medium- and long-term perspectives, thereby developing what Sharpe calls 'future consciousness': a more multifaceted awareness of the future potential of the present moment.<sup>101</sup>

## THE THREE HORIZONS FRAMEWORK APPLIED TO THE TRANSITION TOWARDS A REGENERATIVE CULTURE

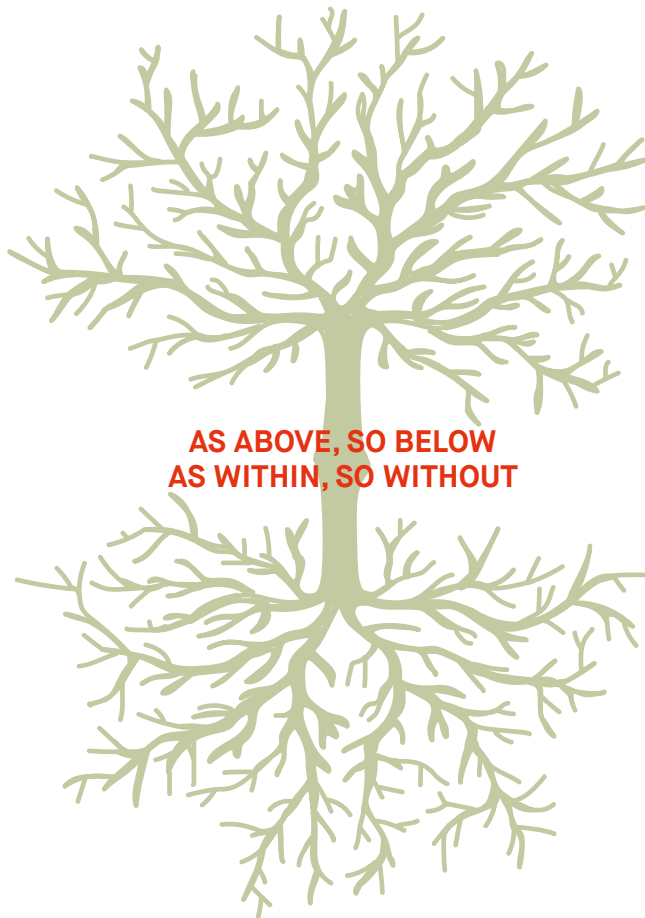


Daniel Christian Wahls' adaption of Bill Sharpe's Three Horizon Framework developed as a foresight tool that can help us become more aware of how our individual and collective intentions and behaviours actively shape the future today.<sup>102</sup>

As Bill Sharpe has put it: The Three Horizon framework 'draws attention to the three horizons always existing in the present moment, and that we have evidence about the future in how people (including ourselves) are behaving *now*'.<sup>103</sup>

The model of zooming in and out introduces a new mindset to the design process, but if we are to truly transform design, we need to reflect on our fundamental values, at the level of meta-design. As described in Chapter 1, most of the world remains stuck in the paradigms of industrialism, post-industrialism, and the information society. Specialization and efficiency have brought us far, but they have also forced us to a point where it is almost impossible to achieve a holistic view of our situation. We have reached a degree of hyper-complexity where we are constantly confronted by the unintentional effects of our own behaviour, and where Timothy Morton's hyperobjects are breathing down our neck.

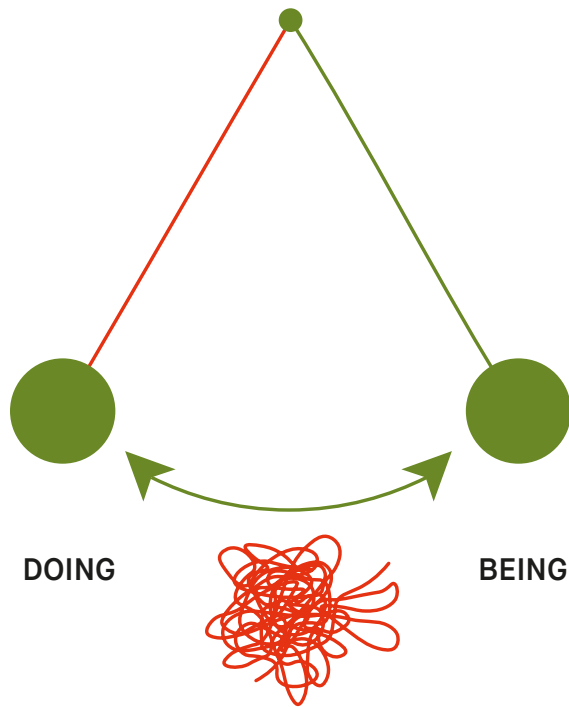
There are no quick fixes, and the method I am proposing is not a quick fix either. What this book hopes to encourage is an individual and collective moment of reflection on the short- and long-term perspectives of our current path. If we are to challenge the industrial paradigm, we need to focus on the existential level and ask ourselves about what kind of world we would like to live in. How can we listen to our surroundings, to our environment, to the whole that we are a part of, to the other species and life forms with whom we share our planet? Starting from here, my question is this: What would happen if we introduced a new element into the rational design process, another mode of listening, looking inward ... and just *being*? For me, this state of being is also a state of being attentive, of slow reflection and silence, as a counterweight to the goal-oriented ways of doing, thinking and reflection-in-action that characterize traditional design processes. My claim is that this state of being can make our zooming deeper, and thus more sincere. At the same time, including an element of being in our design processes can help us confront and inhabit complexity, because it gives us the possibility to switch back and forth between a focus on details and action and an inward-looking mode of being, thus anchoring the orientation of our creativity in the firmer ground.



The wisdom of indigenous people tells us that the outer world mirrors the inner world. The world we live in

is a world of stress. To change this, we must change. The mantra is as above, so below, as within, so without.





The pendulum swings between states of doing and being, and between the two lies the sphere of complexity. In the industrial paradigm, we have come to reside in a state of constant doing, and complexity has therefore increased. By allowing the pendulum

to swing back and forth between doing and being, we will gain an occasion to tune in to ourselves and to the whole, asking whether we are aligned with the planet and with future generations.

## *Let Silence Take You to the Core of Life*

– Rumi

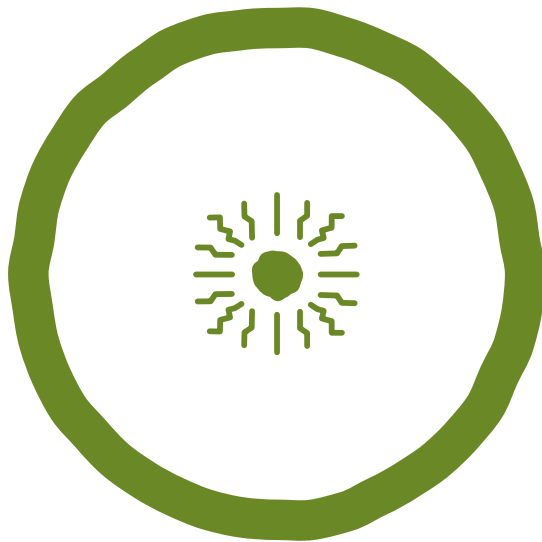
### Presencing

There are many ways to foster the practice of being. In their pioneering works on systemic thinking, Peter Senge and Otto Scharmer argue that we need to step back and consider what parts of ourselves we engage in the creative and decision-making process when we are faced with the hyper-complexity that is currently affecting our organizations and societies. Scharmer describes it as a movement from an outer to an inner perspective.<sup>104</sup> The inner perspective can be strengthened through the practice of *presencing*, a term introduced by Senge and Scharmer in a context of management and innovation theory. In his influential study, *Theory U*, Scharmer introduces presencing as a supplement to traditional forms of development and management. According to Scharmer presencing offers a shift from the usual mode of development to a mode of being that revolves around the inner nature of attention, a state of contemplation without subject or language. The U-model maps out a process that consists of relatively traditional phases, in which we ask ourselves: what is the situation, what is the need, what are the challenges and opportunities, how do we reach a solution or realization. However, at the bottom of the U, right between challenges/opportunities and solutions/new moves, we find a completely different phase, a state of presencing, which marks a shift in pace.

At this point, we step into a totally different mode, shut out thoughts and reflections, and focus on our inner silence. In the Buddhist tradition, this praxis is also known as *vipassana*, in the Western tradition often referred to as ‘mindfulness’ or ‘meditation’. The U puts time, eternity, meaning, presence, silence and the fountain of attention on the agenda, turning away from outer demands for output and efficiency and instead feeling what emerges in us and around us. The U reveals the necessity of pauses, relaxation, openness and thus the deep and regenerative breath of nature. In short, it invites to step into an openness, where there are no words or preconceived ideas.

Scharmer’s book addresses leaders and facilitators in change management settings, but the underlying claim is that presencing can be practised by all. The condition of presencing is focused on ‘not the what and how – not what leaders do and how they do it – but the who, who we are and the inner place or source from which we operate, both individually and collectively’.<sup>105</sup> Scharmer’s point is that, in the context of organizational development and innovation, the practice can be used to focus on both the individual and the collective level and so better observe all that emerges from the social field, the business, and its organizational surroundings.

In design, practices of presencing as part of design methods is not a new idea. It was already a part of the famous Bauhaus art school, where meditation was on the curriculum. It was integrated in the school’s *Vorkurs* or introductory module, which was directed by the Theosophist and artist Johannes Itten. For Itten, meditation was a way of stimulating the students’ creativity and their artistic position in the modern world.<sup>106</sup> But beyond encouraging creativity, I would argue that presencing as a design methodology can be used to strengthen our receptivity to the information that we receive from what may be called *life processes*: those of our own selves, of other people and of the planet.



Inner silence. Integrating the practice of presencing in our everyday lives is not easy in the modern world. Our minds want to move, to think, to create, and to be fed input and entertainment. They are unused to rest and easily bored. But meta-analyses of brain scans have shown that, after

just a few days of practice, meditation can create visible changes in the brain. These changes appear in parts of the brain that are connected with memory, learning, empathy, stress, and self-perception.<sup>108</sup> It goes without saying that a calmer mind leads to a calmer existence.

At the core of training our receptivity to the voice of the processes of life in us and around us is to overcome the barrier between the planet and ourselves, between man and nature. Timothy Morton has described the challenge in such a way that we tend to see all that lies beyond the human sphere as a mere *externality*.<sup>107</sup> Breaking this opposition requires a new understanding of the world, a new ontology, that change the existing modes of dualistic thought and instead develops what Morton has called ‘network of kindness and solidarity with nonhuman beings’.<sup>108</sup> In the concrete context of design and development, this ability can be strengthened through such activities as forest-bathing, meditation, or mindful walking through nature, observing the life and worlds of animals and plants around us. Dwelling in this mode of being is of course no expedient solution to the problems the world is facing, but it can be the starting point for a process of transcendence in which we attempt to reconnect with the Earth, and so reactivate the connection with our environment. Management theorists Giles Hutchins and Laura Storm have described the process as a journey of disconnecting to a ‘journey of reconnection [...] [where] outer and inner sustainability must go together to succeed’.<sup>109</sup> This is no conservative back-to-nature reflex or an argument that everything was better in the good old days, but a learning process, based on solidarity with the planet and the many forms of life and being it carries.

In his influential book *Politics of Nature*, Bruno Latour has argued that to overcome the challenges what are facing right now, there is only one thing to do, namely, to realize that: Nature is dead. Not understood as acid-dead forests or oxygen-dead forest lakes, but as a process of getting beyond the metaphysical straitjacket that the concept of Nature (with a capital N) has constituted for every political activity and scientific thinking.<sup>110</sup> It is Nature understood as something absolute that have to put an end to and instead letting the many discourses

and swarm of practices come to the fore and through that let nature find its way in, not as a universe, but as a plurivers. It is through a constant doubt, questioning and uncertainty that we must continue discussing what kind of world/nature we want like to live in, because it is not just there by itself.



The concept of *forest bathing* comes from Japan and is today practiced all over the world. It is scientifically documented that an extended stay in a wooded area can reduce the release of stress hormones, lower the heart rate and blood pressure, boost the immune system, induce feelings of happiness, and increase creativity.<sup>111</sup> After the First World War, garden therapy was used to treat soldiers suffering from shell shock, now known as PTSD, and trips to nature are now

medically prescribed for people who are afflicted by stress. But stressed or otherwise, everyone can benefit from a stay in nature: when you first feel its positive effects, it will soon become a habit. It is a time where you for a while can stop what we know as *chronos* time, the chronological time, the quantitative time measured with clocks, and step into a *kairos* state of being, where you can lose track or even expand your sense of time.

## Who has the power?

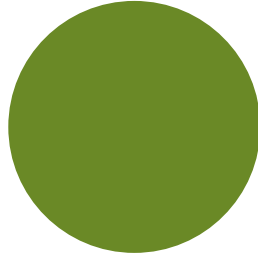
One of the defining aspects of the human species is our tendency to *culturalize* our relation to the surrounding world. Unlike other species, we are able to imagine and plan for the future. This ability makes us exceptional, but the problem is that an insistence on our exceptionality merely reproduces the destructive mindset of the Anthropocene age. We have to break down the dividing line between humans and our surroundings, which requires a *flat ontology* – a non-hierarchical understanding of the world where all beings on Earth have equal status. In this flat notion of the world, humans are confronted with both our own outsized influence on the ecosystem, given our status as a planning species, and the immense power that nature has over us. In the context of climate change, for example, humans have the ability to release CO<sub>2</sub> into the atmosphere, but the natural systems that surround us will react with floods and famines. When COVID-19 struck, it was as if the natural systems were telling us: ‘Go to your room and stay there until you learn to behave yourself!’ Vaccines may have subdued the virus, but other pandemics will surely follow. The natural system will always be a race for survival, and we cannot be sure that we will always stay on top. Despite the privileges that our species have, we always have to understand ourselves in a larger – and more complicated – context. As Donna Haraway has put it, we have to ‘stay with the trouble’ when it comes to the relation between humans and nonhumans, since we cannot merely cut the non-human elements out of our world: they will always keep returning.<sup>112</sup> The relation to nonhumans is one of many areas in which a design approach can help us imagine new futures, based on the fundamental assumption that power on this planet is distributed, and that all species have to work together in coexistence.

As we have heard, a defining aspect of *design cognition* is the ability to let problems, solutions, challenges, and possibilities interact. This interaction takes the form of an alternating process of convergence and divergence – first exploring and opening possibilities, then delimiting and closing them. For this process to be engaging and enriching, there must be some measure of balance between challenge and mastery. Psychologist Mihaily Csikszentmihalyi (halyi) famously described this balance as a state of *flow*. As he puts it: ‘Enjoyment appears at the boundary between boredom and anxiety, when the challenges are just balanced with the person’s capacity to act.’<sup>113</sup>

In this chapter, I have described various ways of working with hyper-complex challenges: using zoom as a lens to see the world and ourselves; supplementing modes of doing with modes of being. With both approaches, the goal is to experience simplicity at the macro-level through de-focusing and at the micro-level through hyper-focusing. At the macro-level, states of being can reconnect us with deeper levels of ourselves and attune us to the well-being of the planet. At the micro-level, the insights that we take with us from the states of being can help us find direction and meaning in our current actions. Of course, this presupposes that the task at hand is framed in a manageable way and that there is a balance between the challenge before us and our level of competence, as we saw in the description of flow. At both the macro and micro levels, we will experience stages of self-forgetfulness, thus entering a state of ‘unselfing’ where we can experience a direct connection with something greater than ourselves.



PLANETARY  
MACRO-LEVEL OF  
DEFOCUSED BEING



DETAILED  
MICRO-LEVEL OF  
HYPER-FOCUSED FLOW

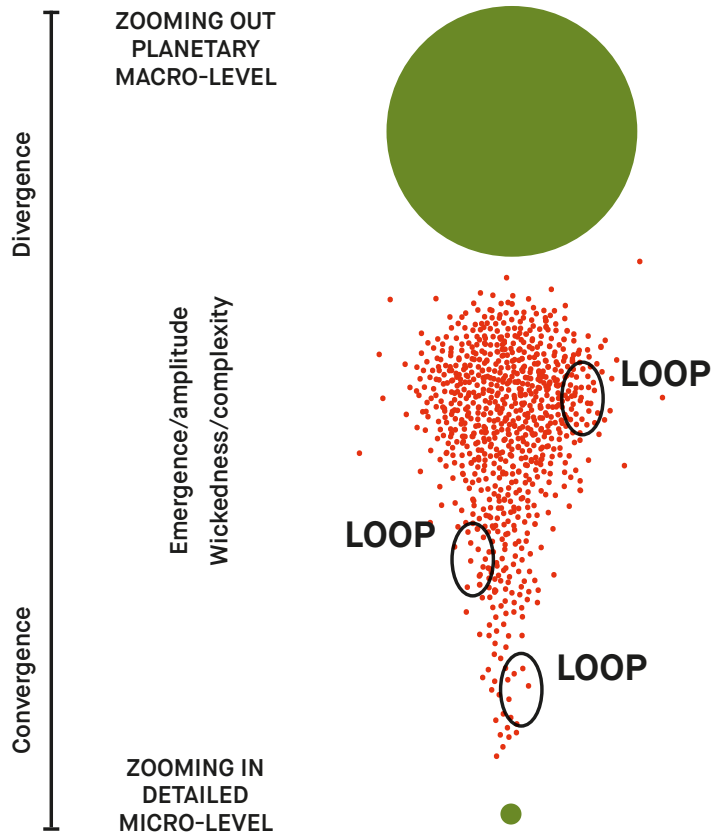


Opposed as they are, the modes of macro and micro-awareness are characterised by the same temporary freedom from the wickedeness of the complexity-space. In this sense, they are connected as a kind of wormhole across levels, where one end puts us in a state of defocused being and the other puts us in a state of focussed flow. We can encounter these states both

individually and collectively, when we behold our planet or when we focus on a specific task – especially if the task is aligned with a larger whole and so feels meaningful and engaging. Being in the making is thus about losing oneself and swinging like a pendulum between the states of being and doing, zooming back and forth between the planet perspective and the particulars.

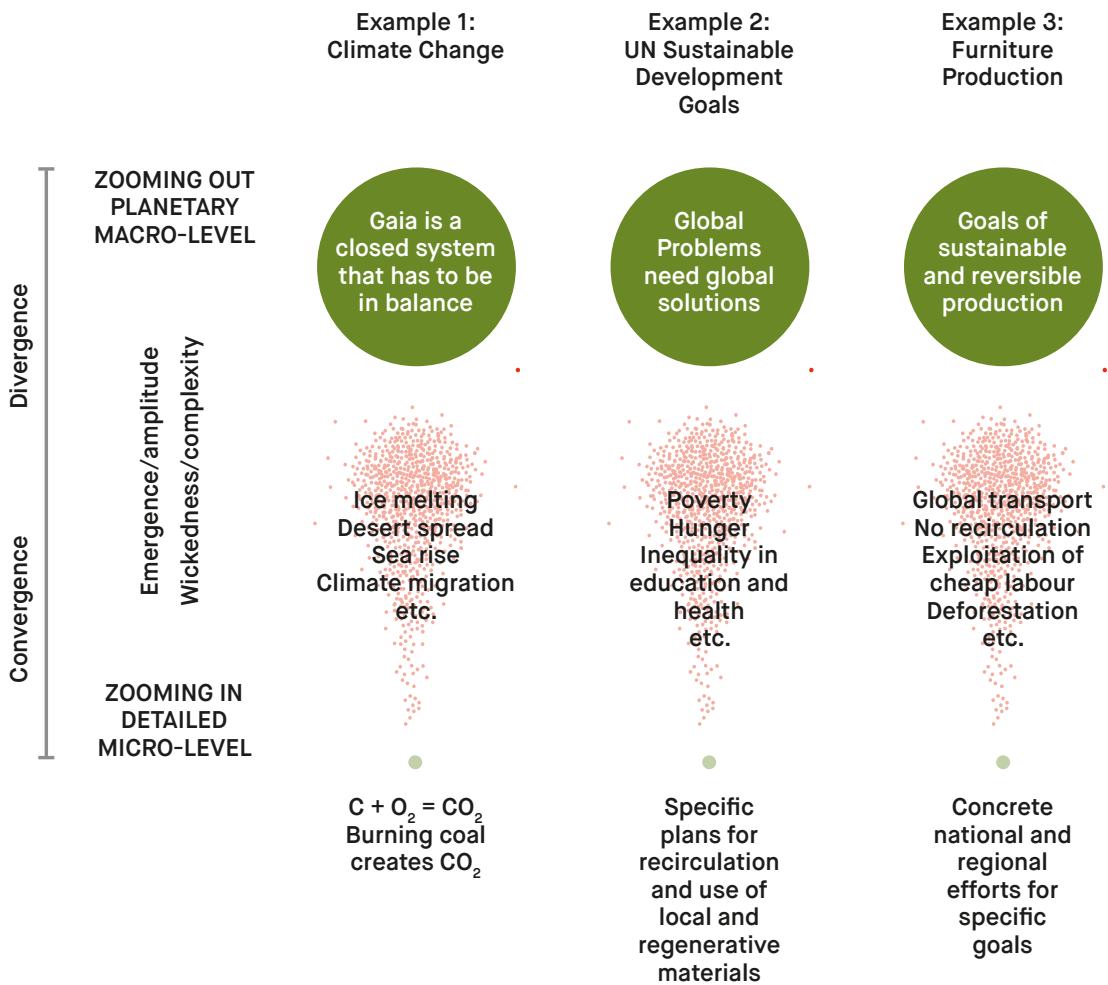
# The higher you fly, the bigger the impact

The alternation between states of being and doing can be compared to the traditional alternation between divergent and convergent phases in the design process. However, the approach proposed here – ‘being in the making’ – radically expands the divergent processes, all the way to a de-focused planetary perspective, while the convergent mindset aims at creating a state of flow when we hyper-focus on the task and our alignment with a larger cause. My claim is that radical transformation is only possible if we maximize the distance between these perspectives in our design processes. In the study of waves, the height of a wave with respect to its lowest point – the distance between crest and rest – is known as its *amplitude*. If we apply this to the previously described goal, I would argue that *the greater the amplitude, the greater the impact*. The models on pages 142–43 show a spectrum of focus, from small to giant challenges, with the hyper-focus of a condition of doing on the one end and the planetary perspective of a condition of being on the other. The models thus illustrate the tension between convergent and divergent dynamics, which move, respectively, downwards towards a greater degree of concretization and action and upwards towards an explorative approach, culminating in the ultimate divergence, which is the defocusing that we achieve in the state of being. My argument is that, if we can make this spectrum wider, we will achieve much greater results and impact.



In contrast to the high-amplitude dynamics that I propose here, all too often we see a prevalence of what one might call low-amplitude loops, which can be found on all levels of complexity – small, medium, large, and giant. An example of a high-complexity loop would be the many political processes in which

everyone has realised the nature of the problem, but whose output is merely endless discussions and non-binding declarations. An example of a low-complexity loop would be an attempt to increase the performance on the internal combustion engine, as this technology will soon be outdated anyway.



The zoom in and out perspectives as thought model, exemplified through three arenas of development.

Planet-level. Example 1 illustrates different levels of perspective on a global problem, here the rising output of carbon dioxide, CO<sub>2</sub>. The complexity field in the middle is where the wickedness is greatest, as we are confronted with all the terrible implications of rising carbon dioxide levels: ice caps melting, temperatures becoming more extreme, deserts expanding, seas rising, climate migration increasing, and so on. Toward the upper part of the model, we are in a completely zoomed-out state of being, where we intuitively realise that the planet is a closed system that must be brought into balance, and the complexity dissipates. At the lower end of the model, in the zoomed-in state of doing and solution-seeking, we face the challenge head on and attempt to come up with pragmatic proposals – each of which will inevitably have its own complications and side effects.

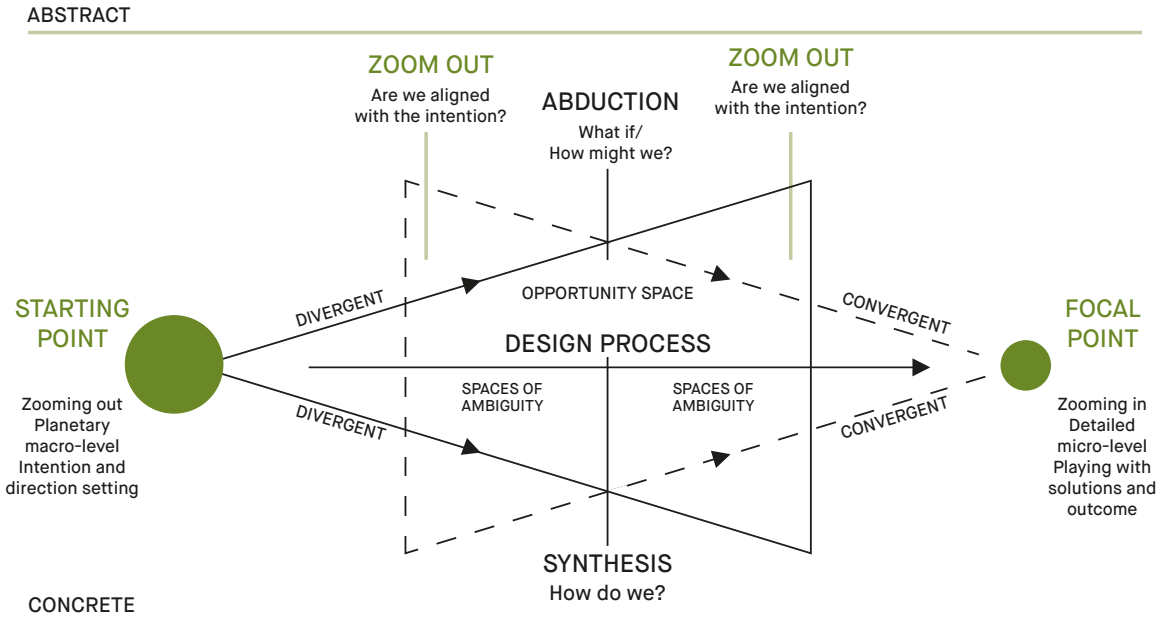
Political-decision-level. Example 2 illustrates a decision-making process with great amplitude, that is the Sustainable Development Goals (SDGs) of the United Nations, which represent the world's most ambitious sustainable agenda to date and a successful attempt to handle a challenge

of giant complexity, as leaders from the 193 member countries managed to zoom out of their respective national interests to make decisions on a planetary scale, instead of prioritising their own local economic or political concerns. Since the SDGs were drafted in 2015, they have served as the basis for countless initiatives on both the national, the regional, and the local level, thereby turning a global strategy into a concrete set of actions with varying degrees of complexity and impact.

Example 3 illustrates a decision-making process in a furniture production company transferring to sustainable production. This change can take many forms, such as for example introducing cradle-to-cradle principles and fair labour standards for the industrial production. This entails many complex decisions and a need for zooming in and zooming out several times. If, for example, the company decides to use bamboo, they will need to choose between imported and locally grown materials. Importing bamboo leaves a carbon footprint and in a planetary perspective this might point towards locally grown materials. On the other hand, carbon neutral transportation might be within reach in a few years, making the decision less important.

# The macro-level defines the direction, the microlevel the steps

Through our history, and especially since the Scientific and the Industrial Revolution, humans have become better and better at ‘crunching’ our problems, by breaking them into smaller and smaller parts and zooming further and further in on them. The upshot is a loss of perspective and a resultant feeling of overwhelming complexity as we lock ourselves into tiny areas of specialism. Even worse, the problems of the whole tend to trickle down the specialism staircase: the main focus of the politician is to be re-elected in the next referendum, the main focus of the sales manager is to snag the next quarterly bonus, the main focus of the designer is to get a better price for their product, and so on. As a result, the solutions that we produce will reflect the problems that we aim to crunch. At the same time, we are also moving in the exact opposite direction, as our society becomes better and better at understanding the larger context of the planetary ecosystem: the macro perspective in which we are entangled and which we cannot escape, ignore, or deny. With these two opposite trends unfolding at the same time, the stark disparity between the solutions we produce at the micro-level and the problems we face at the macro-level is coming into clearer view. The models proposed here – of vertical and horizontal zooming – do not make us choose between the micro and the macro perspectives but show us the necessity of alternating between these perspectives, so as to make sure that they are entangled and aligned. The macro-perspective defines the direction in which we must move, the micro-perspective defines the steps that we must take to get there, and the distance between the two – the amplitude of our efforts – will be the measure of our success.



If we combine the model of chapter 2, that describes the components of a design process, with the zooming in and out framework, my suggestion is that every design process must evolve in a tension field between planetary awareness on a zoomed out macro-level and detailed zooming in on a micro-level. The argument is that mindsets and methods from design can help committing us to the trouble of hyper-complexity while phases of zooming in and out in space

and time can keep us on track with the overall intention. In the zoomed in state, we move towards a greater degree of concretization and action while working with possibilities and solutions. Here the argument is that if the problem-solution spaces we are working in are aligned with the overall intention, we can more easily enter stages of flow because we hyper-focus on the task and its alignment with the larger cause.

We have discussed new mindsets and states of being and looked at how they can supplement existing design processes. I have suggested that we can combine the traditional focus on efficiency with states of contemplation and being to foster sustainable organizations and societies. These states of being can be reached through presencing, planetary entanglement, and a connection with the larger unity of nature and the planet. I propose that we integrate the practice of zooming in and out, across both space and time, into our processes. Zooming across space is about having a focus on the concrete situation while also understanding it from a planetary perspective and evaluating our decisions according to the needs of the ecospheres. Zooming across time is about going back to our roots as well as looking several generations ahead to consider the possible consequences of the choices that we are making.

## The road so far: Milestones

### *From rational goal management to being in the making*

The focus on optimization and rationalization in industrial societies has led to constant time management and detailed specifications. To handle these requirements, we have specialized our functions and created silos of knowledge. We are masters at creating output and controlling details, but it has become increasingly difficult to grasp the complexity of the world we have created and the ways in which it clashes with the other ecosystems of the planet. We often find ourselves caught in a spiral of efficient and goal-oriented doing, where we forget to listen inwards and outwards, to ourselves and to our aspirations, and to what is emerging at the collective and the planetary levels.



In order to handle hyper-complexity, we need to step out of our silos and zoom out. We need to let go of our usual perspectives and patterns of thought so as to contemplate the greater whole. To help us do this, I propose that we supplement our development processes with phases of being that will allow us to connect with ourselves and the whole that we are part of. This will also boost our motivation and engagement in the face of stressful complexity. We need direction and meaning at the concrete level. In groups, organizations, and political contexts, partisanship and red tape often blur our sense of purpose. We should, therefore, make it a rule of thumb that, if we have no grasp of the problem and no sense of direction, we have not zoomed out far enough.

*The earth has everything for  
all human needs, but nothing for  
his greed.*

– Mahatma Gandhi<sup>14</sup>

# Chapter 4. The Needs of the System. Who Is in Charge?

One of my core assumptions throughout this book is that global problems can only be solved with a global outlook. These problems are inherently a shared burden, one that can only be lifted by countless organizations acting together despite the narrow interests by which each of them is driven: ministries of finance, oil firms, media conglomerates, individual citizens all over the world. But as long as these problems are so overwhelmingly wicked, any assumption of responsibility almost automatically leads to cynicism or paralysis. Perhaps the worst possible outcome is a combination of the two, the kind of cynical paralysis that I described earlier as *complacency*: an escapism, a denial of the problem or the implausibly narrow focus of people who are entirely caught up with their own concerns, without caring for the larger picture. But while the stress of our everyday life makes it all but impossible

to handle the global complexity that surrounds us, the condition of being can allow us to connect with the planetary whole, finding peace in ourselves and our entanglement with our surroundings.

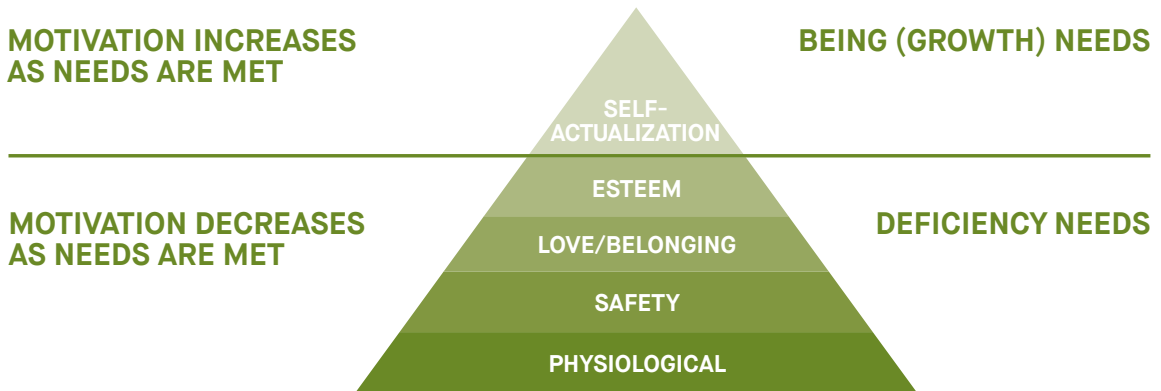
To do so, I have argued that we must begin by exploring the worldviews and values – that is, the meta-design – that we bring to the design process. In the following section, I will look deeper into these values, shifting theoretical gears from design studies to psychology and systemic leadership. My primary interest here is the fundamental driver of our needs, and specifically the question: Who is in charge of these needs? My thesis is that we are often not unaware of the origin of our desires. There is therefore a good reason to ask ourselves whether we are making a conscious decision whenever we develop – or desire – new things, or whether we are merely living out our society’s current ideal of success, an ideal that is driven by notions of growth and competition in all areas. Since the Industrial Revolution and the Great Acceleration (see Chapter 1), our underlying values have evolved dramatically. In the beginning, we designed products to fulfil our needs. Now, we design new needs that satisfy our products. Over the years, this recursive form of design has transmogrified into the design

machine we now know, whose wheel of innovation and consumption is induced by a steady input of fabricated desires. The result is a circuit of needs and solutions that continuously determine one another, creating a constant stream of real or fictionalized outputs, from new gadgets to helicopter trips across the Amazon. The current turbocharging of the design machine would be less of a problem if its products were made of biodegradable materials, fully recyclable, or carbon neutral, but that is not the case. Technical solutions to these production problems must be found immediately, but my argument is here that it is also worth pausing to consider whether the design machine actually produces the things that we need. Following that question the current crisis can be seen as an occasion to reflect on whether we have *other* needs, of which we may not be even consciously aware. Therefore, my suggestion is that we all start looking inwards and take the opportunity to consider which of our wants are fundamental – existential – needs and which are merely fabricated desires. To investigate this question my suggestion is to supplement the perspectives of developmental psychology and evolutionary history of Chapter 1 with theories of motivation psychology. I represent this study field in a reconsideration of Abraham Maslow's famous hierarchy of needs. Maslow proposed his pyramid model in 1943, but in modified form, it still serves as a paradigmatic frame for understanding human needs today. However, in light of the current environmental crisis, my suggestion is that we critically discuss some of its core assumptions.



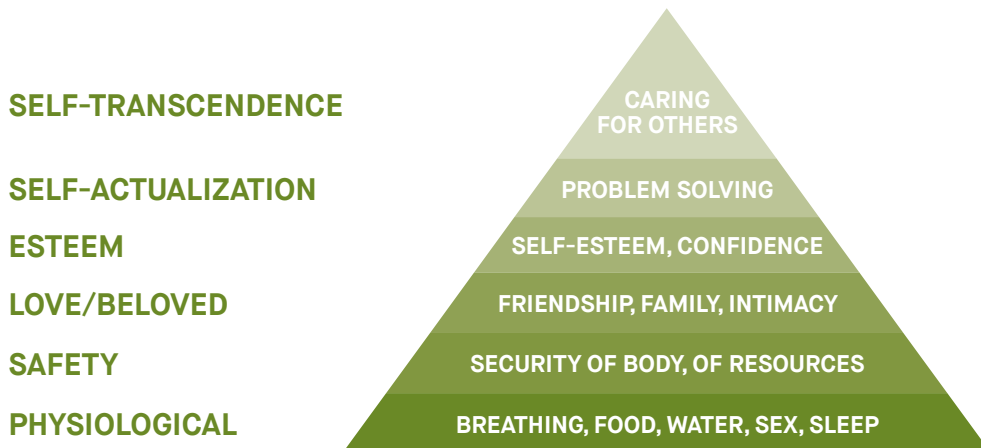
Maslow's hierarchy of needs describes a pyramidal structure, building on the premise that the needs of one level must be met for the needs of the level above it to arise. The pyramid consists of five steps: (1) physiological needs (air, food, water, heat, shelter, sex, and sleep), (2) safety needs (employment, health, protection, and education), (3) social needs (affection, belonging, family connections, love, trust, friends, and acceptance), (4) esteem (respect, self-esteem, independence, status, and prestige) and (5) self-actualization (the realization of one's potential, self-fulfilment, personal growth, and peak experiences). According to Maslow, the fifth and final level marks the desire to become the most that one can be as a person. The first four levels are described as *deficiency needs*, meaning that, when they are met, the motivation to fulfil them fades from view; while the fifth level includes *growth needs*, which can never be fully met, but continue to expand as they are fulfilled – motivating us to pursue them further still.<sup>115</sup>





Abraham Maslow's hierarchy of needs, as proposed in 1943.

## THE HIERACHY OF NEEDS



Maslow's revised hierarchy of needs from 1968, where he added a final level: self-transcendence.

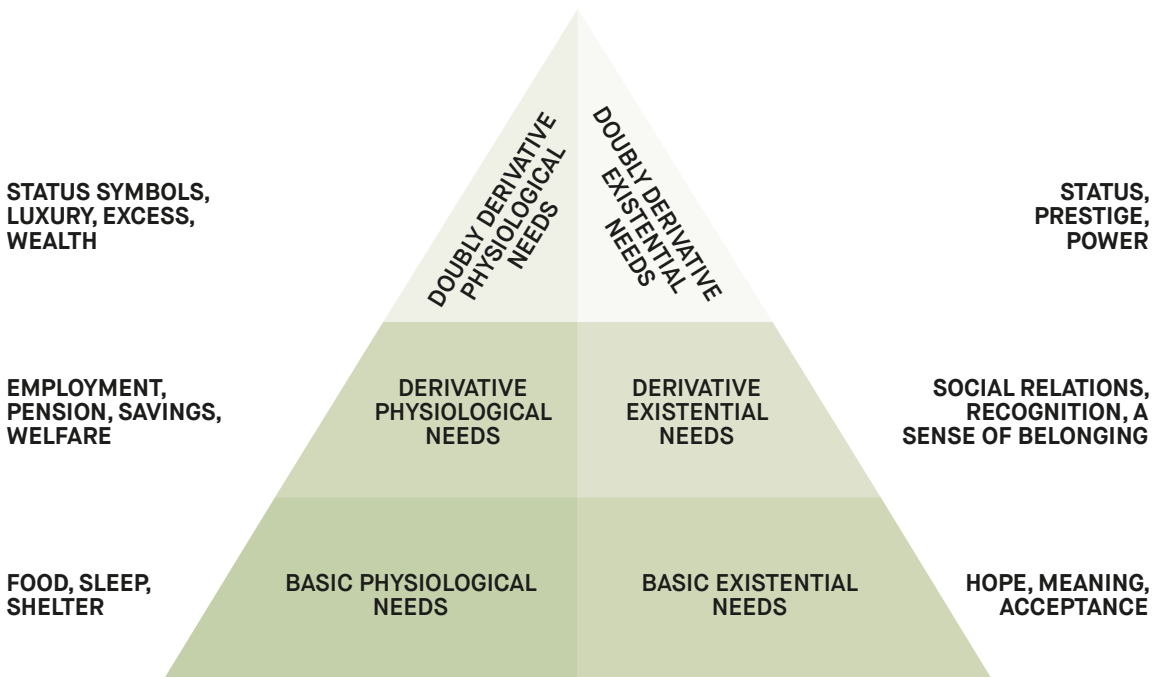


In later years, Maslow critically revisited his pyramid with a focus on the uppermost level of self-realization: he had come to believe that, in order to truly realize oneself, one had to submit to or seek out goals that were larger than oneself, in the form of altruism, spiritual practice, or the like. In his theory, he describes this new and even higher level as a need for *transcendence*, which he defined as follows:

Transcendence refers to the very highest and most inclusive or holistic levels of human consciousness, behaving and relating, as ends rather than means, to oneself, to significant others, to human beings in general, to other species, to nature, and to the cosmos.<sup>116</sup>

One may argue that despite Maslow's addition of a sixth level, the model still reflects a paradigm of motivational theory based on the industrial world's ideals of growth and efficiency. The steps of the pyramid came to be seen as milestones on a journey of successful self-realization, reinforcing the cultural demand for self-optimization in every aspect of our lives. Further, some have criticized the hierarchal structure of Maslow's revised model: because the model presupposes a sequential development, in which a new level of needs only arises when the needs of the level below it are met, the desire for transcendence is essentially placed out of reach for people who lack basic necessities like food and shelter. The logical conclusion is that practices such as yoga, mindfulness, or meditation are made the exclusive purview of wealthy, well-educated and well-connected individuals, thereby excluding yogis, monks, and ascetics, who would traditionally seek states of transcendence precisely by *reducing* their dependence on more basic needs. On the contrary, it might be argued that, insofar as the upper levels of Maslow's pyramids can be identified with the conditions of presencing discussed in the previous chapter, they do not so much as depend on as *reveal* the other needs of the model.

Given my interest throughout this book in the ways in which human consciousness shapes the mindset from which we design our shared future, it is crucial to note that the conditions that Maslow identifies as potentially contributing to transcendence can also be integrated into the practice of design. Further, it is my claim that, in late modernity, we have pursued the satisfaction of manufactured or ‘designed’ needs to such an extent that we have forgotten both our own basic existential needs and the needs of the planetary system. I would therefore propose a revised version of Maslow’s pyramid. The new model consists of two interlinked pyramids, representing physiological and existential needs, respectively, based on the assumption that existential needs on the basic levels are as essential for the conduit of life as the basic physiological needs.



Proposed revised version of Maslow’s pyramid.

Both pyramids consist of three levels: *basic* needs, *derivative* needs and *doubly derivative* needs. In the first row of the left pyramid are the basic physiological needs that are required for human survival: food, sleep, shelter, and so on. In the second row of that pyramid are the derivative physiological needs, that is, activities that secure the continued satisfaction of the basic needs: employment, pension plans, savings accounts, insurance policies, welfare programmes and the like. Taken together, these needs are a way to ensure the continued satisfaction of the basic needs. In the third and final row of that pyramid are the doubly derivative needs, which are in turn dependent on the derivative needs and seek to make their successful attainment manifest, secure and visible to all: these include status symbols, luxury items, excess wealth, and so on. A crucial aspect of the doubly derivative needs is that, unlike the levels below them, they are *relational*: they have no inherent value in themselves but depend entirely on an implicit comparison with what other people have.

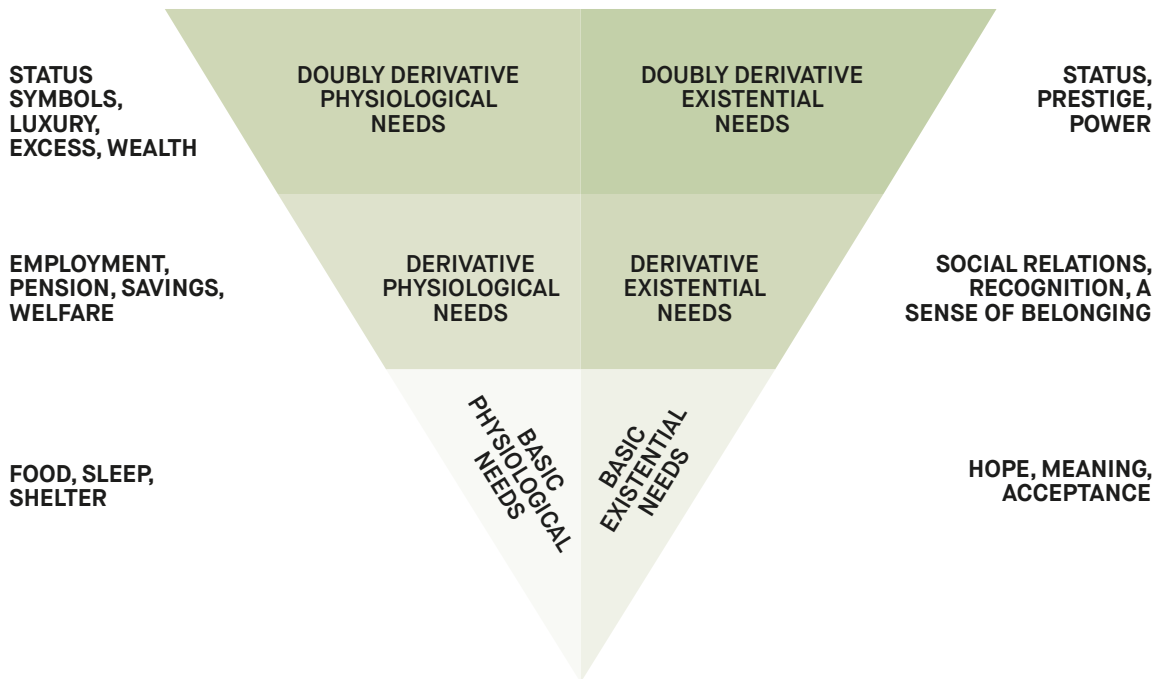
In the right-hand pyramid are the existential needs. On the basic level of this pyramid are fundamental needs such as hope, meaning, acceptance, and a sense of agency. According to the logic of this model, it may be possible to survive on basic physiological needs alone as long as one has *also* covered such basic existential needs as hope for improvement or an acceptance of the present. For example, Robinson Crusoe could survive on a desert island because he had food, shelter, and water, but also because he had hope that a passing ship would someday rescue him. The psychologist and Holocaust-survivor Viktor Frankel has argued that it was the capacity to hold on to hope that determined which prisoners were able to survive the concentration camps. The second level of the right-hand pyramid are the derivative existential needs, which can be either a consolidation of the basic existential needs or a compensation for their lacking fulfilment. In contrast to the physiological needs, I would argue that existential needs can be *sublimated* into derivative or doubly derivative needs: if the existential needs are not

met at the basic level, one can attempt to meet them at a derived level. The derivative existential needs include social relations, recognition, and a sense of belonging, all of which may reinforce or replace more basic needs. Further, religious faith has been tentatively identified as a derivative existential need, insofar as organized religion is a culturally condition system aimed at cultivating hope and meaning, and thus not a basic need but a consolidation of it.

In the third and final level of the right-hand pyramid are the doubly derivative existential needs. Just like the physiological needs, they are in turn dependent on the derivative needs. These doubly derivate needs manifest as a desire for status, prestige, and power. As with the doubly derivative physiological needs, this level is characterized by its relative nature: the satisfaction of these needs depends on what other people possess. In the mediatized society of later modernity, this kind of comparison is de facto endless. Whereas teenagers in small village communities once had only a handful of other teenagers with whom they could compare themselves, today the frame of comparison is global, yielding a true cacophony of identifications and projections. As a modern teenager, one seeks to mimic the behaviour not just of one's neighbours and classmates, but also that of far-away movie stars, reality TV personalities and SoMe influencers. Even a rich man with five Ferrari's and a mansion can look to others in their globalized network that may also have a helicopter – and suddenly that too becomes a need to satisfy.

Unlike the physiological pyramid, it is possible to climb up through the derivative needs on the existential pyramid without having satisfied one's basic needs. It is entirely possible to be a successful president or a celebrated rock star and still lack fundamental hope, meaning or intimate relationships. But I would argue that an over-reliance on derivative or doubly derivative existential needs is not sustainable, neither for the individual person nor for the culture as a whole. If our basic existential needs

are not met, we will wilt and possibly lose our will to live; while our culture will slowly become existentially and spiritually hollow and so presumably collapse in the long run. To describe the state of late capitalism, this updated model should be turned on its head: in our search for power and prestige, we have forgotten that these fabricated desires spring from a more basic need for food or hope. One could argue that the hunt for doubly derivative needs has become the main motivation for most of our actions – driven in part by the hegemonic paradigm of growth and competition that dominates our culture. Our primary desire is no longer meals or meaning, not even security or social relations, but their substitutes, in the form of the status symbols that are conferred by doubly derivative needs.



Proposed revised pyramid turned on its head as doubly derivative needs seem to have become the main motivation for most of our actions in the state of late capitalism. But since the fulfilment of the derivative needs doesn't necessarily solve the

underlying basic needs and only generates further derivations, we need to sharpen our awareness for the underlying values, the meta-design behind design. Do we really need this? Does it lead to social or sustainable prosperity?

In the frame of this updated hierarchy of needs, one could argue that in late modernity, we have trained ourselves to associate needs and dreams with the conceptual sphere of the doubly derivative needs, thus confusing dreams with needs. Further, one could argue that dreams that are tied to doubly derivative needs tend to have an individualistic focus since the satisfaction of these needs is relative to what other people possess. This individualistic focus creates a vicious cycle, in which one person's satisfaction with their doubly derivative needs increases the needs of everyone around them, and so on in a never-ending circle that has driven us beyond the limits of our ecosystem.

The question is whether we can find other ways of dealing with basic and derivative needs. We might have to accept this as a part of human nature: we long for new things and new experiences, we are social beings who need to position ourselves in relation to others, and we need to feel that we belong socially and psychologically while also needing to stand out. If this is indeed who we are, then we must find sustainable ways to design products that fill these needs, ensuring a fully regenerative cycle of production and consumption while working to redistribute resources and combat rising inequality. However, if a new worldview is emerging as suggested in Chapter 1, one based on planetary and holistic consciousness, our constant need to position ourselves in relation to others might come to matter less. According to Beck and Cowan et al., the new level of consciousness would slowly phase out earlier subsistence-based levels of consciousness. Instead of a consciousness based on the fight for survival that leads to the logic of me v. you, them v. us, man v. nature, we might see the emergence of a consciousness based on an interconnected big-picture view of the world, where we are all part of the same planet and therefore care about each other and the other life forms on a deep existential level. Scharmer has described this change of consciousness as a move 'from ego-systems to eco-systems'.<sup>117</sup> At the very least, positioning oneself

might become less important than connecting and feeling part of something bigger, and therein lies the possibility of another way of being in the world. This requires a revolution in our thinking that, according to Orr, must also change the kinds of questions that we ask – ‘from how can we do the same old things more efficiently to deeper questions such as: Do we need it? Is it ethical? What impact does it have on the community? Is it safe to make and use? Is it fair? Can it be repaired or reused? What is the full cost over its expected lifetime? Is there a better way to do it?’<sup>118</sup> Questions like these are not simply about finding a more efficient way to accommodate desires; they are about the improvement of desire and the factors that affect our desire. As Orr puts it:

Our greatest needs have nothing to do with the possession of things but rather with heart, wisdom, thankfulness, and generosity of spirit. And these virtues are part of larger ecologies that embrace spirit, body, and mind – the beginning of design.<sup>119</sup>

We have looked at the field of motivational psychology to understand the basic needs that underlie our actions and design decisions. We have seen how some of these basic needs, such as hunger and thirst, are biological, while others are social: the need for safety, for relations with others and, not least, for self-actualization. We have seen how the industrial production- and consumption-machines have gone into hyper-drive, reshaping our understanding of what we need. We now meet basic needs as well as derivative and doubly derivative needs, as illustrated in the revised version of Maslow's Pyramid of Needs, where the relational aspect is highlighted and reinterpreted. The expansion of digital media and social platforms has led to constant comparisons and a torrent of new needs.

## The road so far: Milestones

The societies we live in trace their origin back to a time when humans 'moved out of nature' and became agrarian instead of hunters and gatherers. We built settlements, claimed territories and resources, and began to design nature. We started working and achieved security of supply and safety from animals and the weather. Settling down also meant that we no longer had to carry our belongings with us, so we acquired more belongings, and we have been hoarders ever since. The concept of a stationary home somehow also creates a sense of ownership, even sentimental value, leading to a more self-centred form of living compared to the tribal society of hunter-gatherers. With the creation of an agrarian society, we not only took possession of nature, but we also laid the foundation for private property, taxation, class, and so on, and for the production- and consumption-machine with its endless stream of derivative and doubly-derivative needs that sets us apart as individuals and keeps us constantly unfulfilled.



Today, we face the dilemma that our current lifestyle cannot continue if future generations are to have their needs met and if we wish to achieve sustainability in the global ecosystems. We need to be more conscious about the needs that drive us and take responsibility for the balance between our needs and those of the planet. Can we find regenerative ways to deal with our need for products and experiences, or will we see the emergence of a worldview based on other kinds of needs, for instance, the need to connect and feel part of something bigger? This worldview would lead to other societies and forms of living that we do not yet know. Whatever path we choose, the major motive behind our actions as individuals, as organizations, and as species should be to take responsibility for our actions.

*Humans are capable of a unique trick: creating realities by first imagining them, by experiencing them in their minds. When Martin Luther King said, 'I have a dream', he was inviting others to dream it with him. Once a dream becomes shared in that way, current reality gets measured against it and then modified towards it. As soon as we sense the possibility of a more desirable world, we begin behaving differently, as though that world is starting to come into existence, as though, in our minds at least, we're already there. The dream becomes an invisible force which pulls us forward. By this process it starts to come true. The act of imagining something makes it real.*

– Brian Eno<sup>120</sup>

# Chapter 5. Creating Change. How Do We Get Started?

As we have seen, stepping back and contemplating the values and needs that underlie our decisions is a prerequisite for radical change. In this chapter, we will look at ways to build the capacity for fundamental changes. Systemic leadership is – sometimes implicitly – built on the theoretical foundation of systemic thinking, and we need to follow this thinking to its roots if we are to achieve a more profound transformation. We need to understand the mechanisms and the resilience of systems in order to change them. In what follows, we will look into the resistance that systems put up – the ‘immune system of systems’, as it were – and explore ways of working with this resistance. We will then examine tools for what I call ‘system acupuncture’, namely models intended to soften systems and allow for new patterns to emerge.

Systems theory spans across many academic disciplines, including biology, sociology, political science, and management studies. One of the early definitions of system thinking was proposed by Donella H. Meadows in her aforementioned contribution to the 1972 report *The Limits to Growth*. Here, Meadows, an environmental scientist, presented this straightforward definition of system thinking: ‘A basic principle of a system is that it is something more than a collection of its parts.’<sup>121</sup> And further ‘systems thinking will consider three key aspects: *elements* (the parts of the system), *interconnections* (the way these parts relate to and/or feedback into each other), and a *function* or a *purpose*’. According to Meadows, the elements are the most tangible aspect of the system and are thus the easiest to understand: when we try to optimize the output of a system, we tend to focus on the elements. But according to Meadows, it is the last aspect – the function – that is the most crucial determinant of a system’s behaviour. Accordingly, the essential characteristic of a successful system is its ability to maintain a harmony between the function of the overall system and the function of its individual parts.<sup>122</sup>

Building on Meadows’s theories, one could argue that the reason we are struggling to make our society more sustainable is that, when we attempt to resolve complex challenges, we focus too narrowly on individual elements of the social system, as evidenced by the economic system’s exclusive focus on well-delimited goals like economic growth. If we look specifically at questions of organizational and social structures, a key point for Meadows is that we must be conscious of what overall function the system is serving. From the perspective of sustainable development, we must always bear in mind that the systems that came before us – such as the planetary ecosystem – have found balance through evolution over millions and billions of years. By contrast, we humans create new systems at an ever-increasing pace,

but going forward, we will have to make sure that every new system is able to fit into the larger planetary system without damaging it or disturbing its equilibrium. From a design perspective, this means that since we cannot rely on the long evolutionary adaptation that has guaranteed the balance of the natural ecosystems, we instead have to consciously consider the long-term impact of the systems we design – and this approach calls for restraint and reverence of the larger whole.

Another systemic perspective that we can bring in to consider the man-made systems and their connection with the surrounding ecosystems is summarized in the concept of *autopoiesis*, meaning *self-creation*. The notion was first introduced by the Chilean biologists Humberto Maturana and Francisco Varela, who in the 1960s–1980s carried out extensive studies of biological systems to understand the interaction between the organization of living individuals, their nervous system, and their surrounding environment. They wanted to explore how living systems create knowledge, organize themselves and communicate with one another, and their studies led them to an important set of conclusions: living systems are *circularly closed*, *self-replicating*, and *self-referential*. In other words, all living systems have an innate capacity to create and renew themselves – a capacity that, according to Maturana and Varela, is also found in humans and their social systems. These findings drew the attention of sociologists and theorists of organization and leadership, who began to study how the living processes found in nature can serve as an explanatory model for the social processes that unfold between individuals, in organizations, and in societies. In the present context, it can help us to understand the intentions and processes that lie behind our human-made systems and thereby also determining the driving forces behind our desires and actions. In the 1980s, the eminent sociologist Niklas Luhmann began to employ the concept of autopoiesis to describe the different sectors of society (politics, economy, law, art, research, and so on) as *self-organizing systems focused*

*on observation.* In Luhmann's view, human individuals could be understood as psychic systems that came together to form social systems: both individual and social systems are characterized by their production and deployment of meaning through observation. According to Luhmann, this means that there are as many realities as there are biological entities, but we can share our experience of reality through communication and thereby continuously create a shared meaning. In other words, reality is not something that is simply *out there*: it has to be experienced by individuals and constructed through communication with others.

In organizational psychology, this idea led to an understanding of individuals as self-referential systems who interact in complex ways and together determine how the culture of an organization will be developed and maintained, and how its processes will typically unfold. From an autopoietic perspective, individuals in an organization can be said to communicate based on assumptions and images that they have created together through observation of their surroundings. Of course, these images can be reworked and reshaped, meaning that it is possible to construct a new reality through the interplay between individuals. A crucial corollary is that this process cannot control the activity since the system will perceive that system *according to its own logic*. The system's operations are its own, not the environment's, seeing as the system only relates to its own closed logic. Everything else will be related back to the system's point of departure – which will be different for each system. Organizations, businesses, societies, and even human beings can all be understood as self-referential systems in this line of thinking.

If we shift our focus to the question of environmental design this argument is relevant because of the many explanatory frameworks that humans have constructed throughout our long history to make sense of the 'system-external' world: *nature*, the *biosphere*, and so on. The

system-external world now confronts us with a complexity that we cannot understand, however over time, we have developed internal systems of meaning and practices that we can use to reduce this complexity, but which cannot take their full reality into account. According to this perspective, even Luhmann's theory is self-referential: the recursivity of his theory means that we cannot see beyond the borders of the system, we will always be trapped in the internal logic of the system. As mentioned earlier, the new material turn in the sciences is a critical counterweight to constructivist approaches, as the latter tend to become closed systems that focus exclusively on man-made language, culture, or systems. Consciously or otherwise, they neglect the questions of the relation between human agency and the natural or non-organic world. All systems have resistance towards change, a resistance that Peter Senge describes with the metaphor of the immune system. The harmful hyperactivity of immune systems is common in biological processes such as in pregnancies where the mother's immune system initially resists the foetus, or at the onset of a caterpillar's transformation, where its cells will fight off new butterfly cells. We see the same in social processes such as learning: pointing out this similarity, Senge notes that, when we learn something new, we often feel uncomfortable and incompetent. We can easily convince ourselves that what we are trying to learn is not so important after all and give up: this is our psychological 'immune system' at work. Correspondingly, in businesses, we encounter an organizational immune system whenever innovators, entrepreneurs, and developers have their ideas ignored or obstructed.<sup>123</sup> When it comes to environmental matters, climate activists often find themselves branded as hippies or naïve idealists.

To set new trajectories for the future, I propose that we focus our attention on the systems that we have created and that we are still maintaining, even as they pose serious problems to our lives. One way to do this might be to make ourselves aware of the dynamics of the systems by



zooming out and looking at them from above. We have proven that we are capable of doing this: as described in Chapter 1, we have seen that the creation of a shared direction is possible on the political level, as when leaders from around the world formulated the United Nations' SDGs and so set out an agreed-upon course for sustainable development for the globe. Hopefully, we will see more of this kind of political consensus in the future, as the world's leaders realize that climate and environmental problems cannot be ignored. However, these top-down transformations cannot stand alone: they must be supplemented with bottom-up and trickle-across transformations as well. Regardless of their level or their direction, attempts at transformations will inevitably encounter resistance and systemic recursivity. In the following section, I try to offer a way of combining systemic leadership thinking with design thinking to establish a new approach for testing ideas, working across disciplines, exploring problems in greater depth, and developing shared directions – an approach that I will call 'systems acupuncture'. The metaphor seems particularly apt because the goal is to loosen up knots in the system by pinpointing and challenging very specific places or dynamics.

As we saw in the previous section, one of the preconditions for creating radical change is that the system can be challenged. Systems are self-sustaining and self-organizing, and changes are therefore difficult to implement within the existing framework, since the system will always push back. Many of the ideas presented in this book can be seen as one long attempt to grapple with the self-organizing character of systems, driven by a stubborn commitment to transforming them despite their resistance. As shown by shelves upon shelves of research in the field of change management, there is no single magic trick to successfully implement systemic change.

From a societal perspective, the self-replicating logic behind most organizational and social systems today is still determined by an industrial paradigm: think of state bureaucrats constantly updating their rules and regulations, or commercial businesses always looking to carve out a platform for themselves. Neither one is equipped to handle the hyper-complexity and the demand for agility that the world requires, not least with respect to sustainable transformation. Old structures stand in the way of emerging solutions. The global car industry only began to change in a more sustainable direction when the commercial success of Tesla posed a direct threat to it, but even then, sustainable change has proven hard to achieve. As an example, leaders of the German car industry, which is among the most advanced industries in the world, would rather incriminate themselves and tamper with the environmental certifications of their products than they would make any real changes to the system.<sup>124</sup> The consequences are clear for all to see: the traditional car industry mainly ‘innovates’ by creating electrical versions of old products, while their esteemed, hyper-educated leaders await trial or, as in the case of Carlos Ghosn’s escape to Japan, become the unwitting leads of a tragicomic soap opera.

In all our businesses and organizations, we see vulnerabilities in the ways we organize ourselves and cooperate with one another. Overburdened managers have little or no understanding of the complexity they are supposed to be managing, and their employees are stressed and demotivated. In general, there is no will and no capacity to take on the large challenges that lie beyond our daily grind: instead, we run around putting out small fires, while the planetary fire heats up in the background. But the question is how to push this system into change, if it always hits back and shuts down our attempts at transforming it. There is no easy answer – if there were, we would already have done it. Instead of a miracle cure, I here present some ways in which we can *begin* to challenge and disrupt the existing systems, so as to create a better platform from which to design the future. These approaches are presented under the following headlines: ‘Redpilling the basic assumptions’, ‘containing change’, ‘mobilize collaboration’, ‘Co-designing participation’, ‘speculative design as social dreaming’ and ‘becoming utopian’.

## Redpilling the basic assumptions

To begin our systems acupuncture, we turn to Meadow’s emphasis on systemic functions. Since the industrialization of society, the main function of most of our social systems has been to increase productivity. This has led to greater economic growth for society as a whole, but that growth is not equally distributed. Owners and shareholders have amassed capital, while the system has created still more derivative and doubly derivative needs, to the point where the richest of the rich race each other into space and still seem unfulfilled. Sheiks and oligarchs put golden faucets in their jets because their primate instincts warn them against starvation. If this seems overly simplistic, consider the rapid growth in luxury bunkers in New Zealand: like squirrels in hyper-drive, the richest gather supplies for an endless winter. The premise that

wealth would make us happy and safe loses all meaning when it is distorted into the idea that ‘more wealth will make us happier and safer’, and ‘extreme wealth will make us extremely happy and extremely safe’. But what if the premise was wrong to begin with?

To dig deeper into the dilemmas posed by basic assumptions and premises of our systemic functions, I will introduce a concept from systemic leadership theory: the lilypond model, as developed by Edgar Schein from the MIT Centre for Organizational Learning. The lilypond is a metaphor for those levels of an organization that need special attention if one wants to work with effective transformation.<sup>125</sup> Schein regards a company culture as a systemic whole, dividing the lilypond into three levels. At the highest level we have *artefacts*: objects, behaviours, and norms that make up the visible elements of the system, akin to the waterlilies on the surface of the pond. Beneath this level – just below the surface – are the *shared values*: the principles that are enshrined in the organization’s vision and mission statement, as well as all the priorities that are chosen from a general strategic standpoint. The third and deepest level of the organization comprises its *basic assumptions*. These are the unconscious beliefs that are taken for granted without ever being made explicit: the managers’ and the worker’s underlying thoughts and emotions. They manifest as implicit norms that define the ethos of the organization, in the form of unspoken ideals for success or choices of whom to hire and fire. These basic assumptions shape the fundamental culture of the organization, the culture that the other levels merely reflect and express. Schein uses the lilypond to describe organizations, but it is not a far cry to apply it to societies as well. The questions for each level will be the same: How does the underlying culture manifest itself in infrastructure, architecture, transport and service systems, and so on? What explicit values are made manifest in norms and in political and social guidelines? What are the basic assumptions? The answer to

these questions will of course vary between countries, regions, and neighbourhoods.

The point is that as in a natural ecosystem, the artefacts, visions and basic assumptions of an organization or society will be continuously adjusted in response to its internal dynamics. Schein notes that this system is both constantly evolving and fundamentally stable. A central point for Schein is that the surface elements of an organization – or for that matter a society – are always nurtured from below, meaning that superficial changes may belie a deeper continuity. Accordingly, it is only from below that fundamental changes can arise.

If we apply this logic to the goal of sustainable transformation, it means that it is impossible to radically change a business's or a society's culture in a more environmentally conscious direction unless we intervene in these deep beliefs and understand their connections with the rest of the lilypond and its environment. Schein's model makes clear that green vision statements will not in themselves lead to the sustainable transformations of a businesses or a society. As long as we keep operating according to the same old basic assumptions that were shaped by the industrialization of society, where human-made systems are viewed as more important than natural systems, and economic growth as more important than human well-being, the organizations will not truly change. Transforming the deeper levels of the lilypond is a great challenge for an organization – let alone for an entire society or a global system. To undertake such a transformation, we need what system leadership theory calls a shift in worldviews, *a shift in consciousness*.

We can metaphorically call this shift for a *Redpilling of the basic assumptions*, inspired by the famous 1999 sci-fi classic *The Matrix*. In the film Orpheus offers the main character Neo a red and a blue pill: 'This is your last chance. After this there is no turning back. You take the blue pill – the story ends, you wake up in your bed and

believe whatever you want to believe. You take the red pill – you stay in Wonderland, and I show you how deep the rabbit-hole goes.’ In *The Matrix*, taking the red pill means seeing the truth about the state of reality. It is a hassle and a road full of resistance, because the Matrix fights to keep up its illusion. But once you have seen through that illusion, there is no turning back.

In relation to Schein’s metaphor of the lilypond, we cannot just paint the lilypond in another colour to change the culture of the system. We need to become aware of the basic assumptions beyond artefacts and exposed beliefs. And if we are to change these assumptions at a deeper level, we need a new way of thinking, a new consciousness. And this change will have an outer manifestation. As Otto Scharmer has put it: ‘form follows consciousness.’

**ARTEFACTS**  
**VISIBLE, TANGIBLE MANIFESTATIONS**  
**OF CULTURE**



**ESPOUSED BELIEFS AND VALUES**  
**HOW YOU PUBLICLY EXPRESS WHAT YOUR**  
**ORGANIZATION HOPES TO ACHIEVE AND HOW**  
**YOU ASPIRE TO DO YOUR WORK**

**UNDERLYING ASSUMPTIONS**  
**OFTEN UNSTATED OPERATING PRINCIPLES**  
**THAT DRIVE THE WORK OF AN ORGANIZATION**  
**AND ITS PEOPLE**

The lilypond metaphor, developed by Edgar Schein, maps out the three levels of an organization's culture. The first level is the visible manifestations that 'flower' on the surface. The second level is the explicit values that support these manifestations, and which can be seen through the surface of the water. The third level is the hidden root system – a network of basic assumptions and uncon-

scious values – that nourishes and shapes the entire plant. If we look at sustainable development, the point is that we cannot transform individuals, organizations, and societies without addressing the basic assumptions. These are often unconscious and therefore it takes introspection, reflection, debate and, last but not least, the will to transform.

### **Systems within systems.**

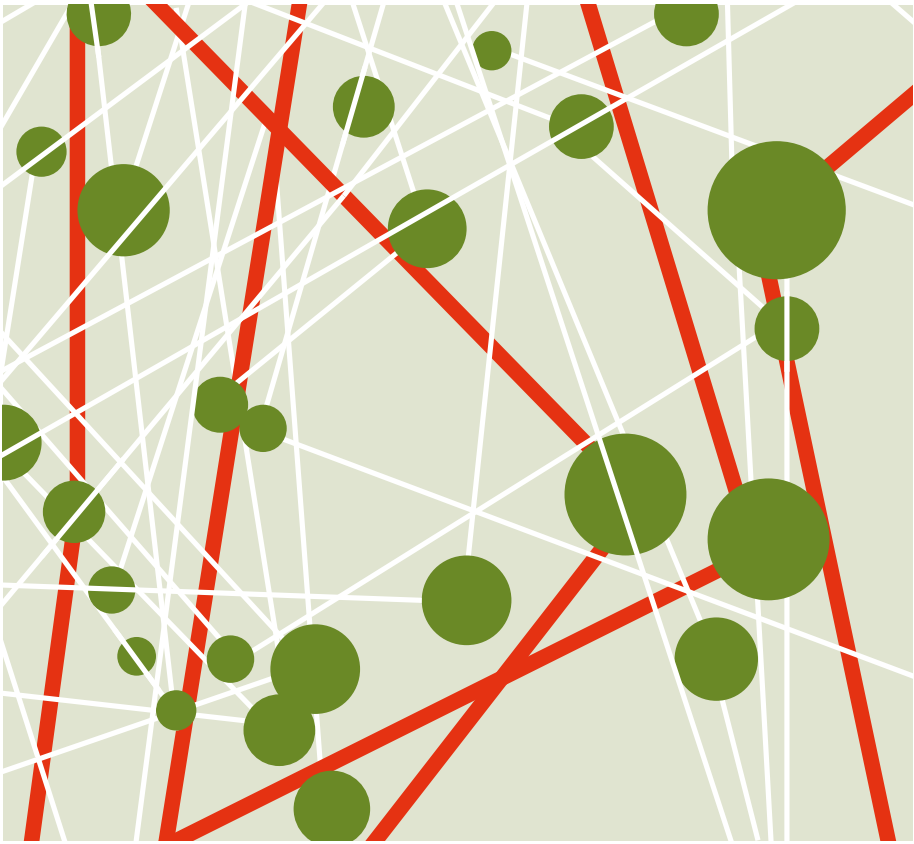
The engineer and management theorist Frederick W. Taylor is said to have declared that ‘thus far, humans have come before systems; in the future, systems shall come before humans’.<sup>126</sup> That statement turned out to be prophetic, and since then, we have been building systems upon systems, which in their hypercomplexity have attained a self-referential justification: they exist because they have to exist. The systems were created by humans to serve human interests, but they have become increasingly disconnected from their original purpose. One example could be the system ‘money’, which was invented to store a real value (say, food), in a temporary and imagined value (say, seashells or gold). But now money seems to have lost its connection with real value, and today even the most insightful economists have no way of understanding the structure as a whole. The many systems within systems that we have built, in which we live, and which shape our lives seem not to have given us more power but instead taken control away from us. One can understand the artificial world of human-made artefacts and systems as an enormous barrage balloon that has grown so large that

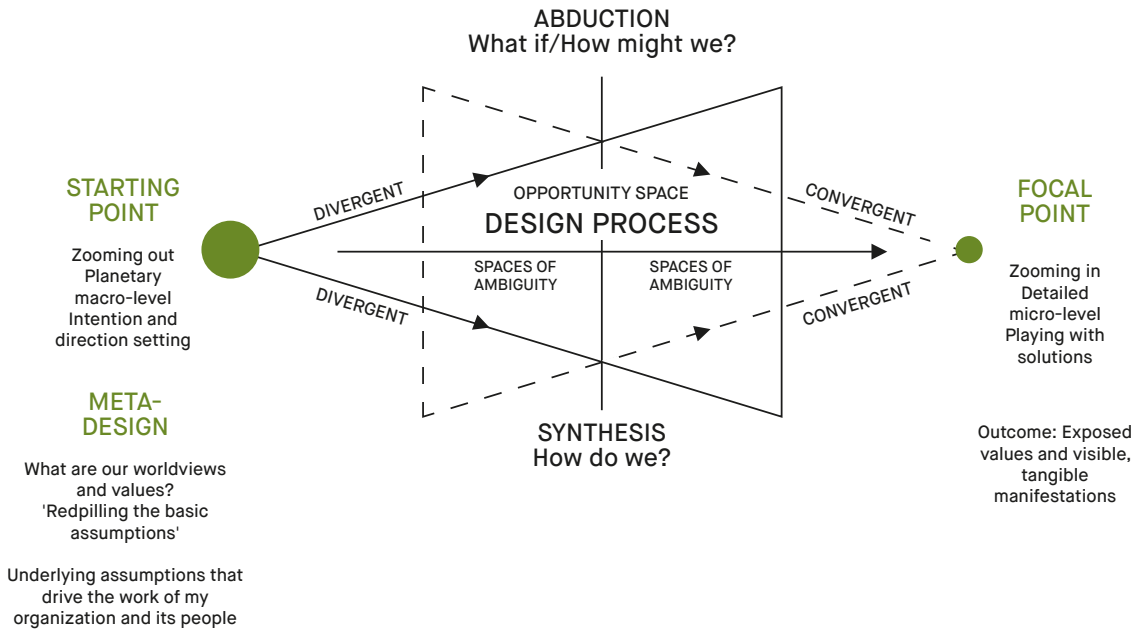
it threatens to crush its creators.

We are now deeply enmeshed in our system-controlled lives and largely complacent about the problems, even as there is an increasingly dramatic concern that the sources of welfare are about to become exhausted, as Ulrik Beck famously put it.<sup>127</sup>

As a result, it has become increasingly impossible for us to align our ideas and actions with the reality of the planetary system. In the Anthropocene age, we are turning into a self-referential organism that finds it still harder to move through the world with due consideration and to have meaningful encounters with what is radically different from ourselves – what the French philosopher Quentin Meillassoux termed ‘the great outdoors’.<sup>128</sup> This is the case both on a biological level and on a psychological and speculative level. We have become impoverished creatures, at least when it comes to the possibility of experiencing the unfamiliar, the unknown, and the foreign. However, the critical condition in which we find ourselves can also serve as the foundation of a new kind of realism, a new relation, a new being in the world.







Edgar Schein's lilypond is a metaphor for levels of organizational culture, but it can also be turned into a framework for working with the meta-level of design, what I've called 'redpillling the basic assumptions' behind our design actions. If we combine this with the design process model from Chapters 2 and 3, it can be one out of many possible frameworks for working consciously with the values: the very premises that we design from. Depending on what context we

are in, we can formulate questions for the meta-design phase that can help us becoming more aware about what basic assumptions and beliefs guide the intention and direction setting of our design process. According to the concept of the lilypond an awareness of the basic assumptions can change the whole setting, the whole culture, around a process and an organization, thereby changing the idea about why, how and what we design.

## Containing change

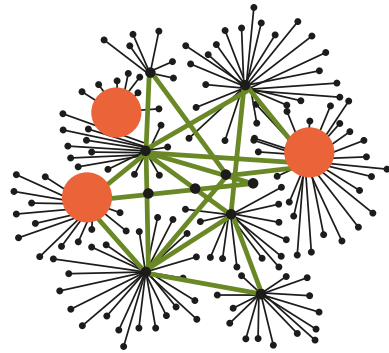
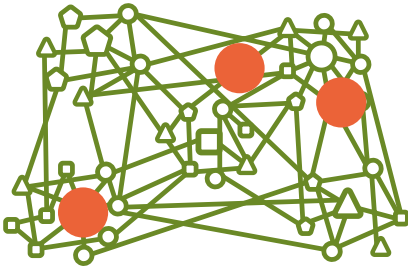
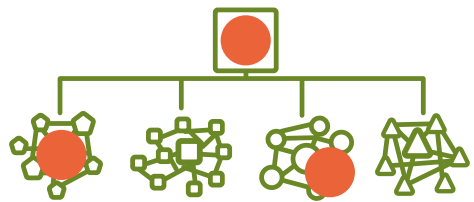
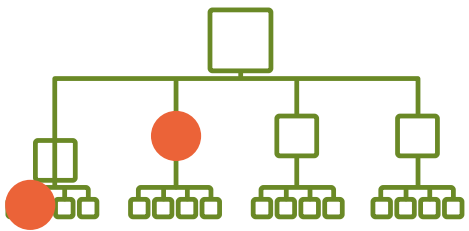
In the following, we will focus on the day-to-day practice of affecting and nudging systems to make way for our aspirations for a sustainable future. There are countless ways of doing so, but I propose challenging systems by building creative havens, where ideas can grow and be tested before they are released into the larger system. Inspired by systemic leadership theory, I call the construction of these creative havens *container-building*. Container-building is the practice of establishing exploratory spaces that can stimulate change in organizations or societies. The concept was first introduced by Peter Senge, who traced the practice of container-building all the way back to Medieval alchemy, which produced some of the earliest known theories of transformation. For alchemists, the container in question was a closed pot that was slowly warmed over the fire, precipitating the transformation of the elements in it. Senge refers to the famous psychoanalyst Carl Jung, who argued that writings on alchemy are as much about psychological transformation as about material transformation, meaning that the concept of the creative container can equally well be applied to social and organizational change. According to Senge, these kinds of containers can also be found in the natural environment, as for example in the aforementioned butterfly's cocoon: within this silky container, a transformation takes place, the organism 'melts' into a new form, and a battle takes place between the old and new. The larvae cells actually attack the newly made butterfly cells, until the latter take over and begin to find their form. The same occurs in the body of a pregnant woman, and most people working with organizational development will know the feeling when ideas hit the organizational immune system.<sup>129</sup>

According to the theory of systemic leadership, containers can be built by anyone in any context. It can be a top-down project, as when politicians establish a taskforce to rethink the economic framework of the green transition,

or when a CEO initiates a radical transformation of the company's work culture. But creative containers can also be established through a bottom-up or trickle-across initiative, as when an engaged employee sets in motion a larger shift through a series of micro-actions, creating change from within the organization – or, in the political example, when a group of citizens organize an activist intervention in their local community.

Of course, not all containers are equally transformative. In the context of the green transition, I argued in Chapter 3 that one must strive for high-amplitude thinking when establishing and facilitating the creative processes that take place within these containers: that is, one must pursue the maximum amount of tension between divergent and convergent processes. One way to do this is to continuously tune in to the larger whole, on the macroscopic level of the planet, and then return to practices such as prototyping and materialization that create shared images of that ambition, on the microscopic level of doing.

In a longer perspective such containers can metaphorically be compared with worms in an apple. If successful over time more containers within the same system will be connected, weaving a new web of beliefs and thereby new systems, practices, and social and cultural settings. Working with system acupuncture therefore not only has to do with the establishing of singular containers that can hatch new aspirations and actions, but also about connecting initiatives and thereby growing ecologies of interconnected interventions.



System acupuncture. Creative containers, here illustrated as red dots, can serve as the cradles for new ideas and aspirations, and they can potentially emerge at all levels of society. They can be created within an organizational pyramid – at the top, in the middle, or at the bottom

– or they can be the framework for a given team in a matrix organization or serve to incubate a new venture in a project-based organization. They can form one or more cells in an organization, in civil society, or among groups of engaged citizens and consumers.

## META-DESIGN GUIDED BY PRINCIPLES

The journey of container-building is a path of decisions and expressions that takes the initiators, hosts, and participants through a process increasing attention towards deep needs, values, and dreams. The very premises we design from.

## ORIENTATION

Zooming out in space and time: What is the overall direction, what is the time frame?

Zooming in: What do we want the participants of the container to work on? What do we want to investigate and explore? What do we want to change? What do we hope to achieve?

## CONTENT IDOART

A container can have a physical or symbolic expression, but it primarily consists of the content and the people participating in it.

One possible inspiration for focus points comes from *IDOART*, which stands for:

*I: Intention:* What is the intention behind the process?

*DO: Desired Outcome:* What are the expectations or the fixed goals for the organization, the group, and the individual participants?

*A: Agenda:* What is the programme and the focus of the process?

*R: Roles and Rules:* What are the principles and rules? How are the roles distributed?

*T: Timeframe.* What are the planned meetings and milestones?<sup>130</sup>

Above seven points to be aware of when establishing and facilitating processes of container-building.

## PEOPLE HOSTING AND PARTICIPATING

In container-building processes, *the host* is not the typical project leader, but the facilitator of a distributed leadership in which the participants can take turns to move the group in a new direction. All the same, the facilitator can guide, intervene in, and change the course of the dialogue, so as to act as a midwife or 'space holder' for the emerging ideas.

*The participants* are those who contribute the data and information that constitutes the task or situation to be dealt with.

If processes aim to have a transformative impact, it is important to invite a diverse range of voices and interdisciplinary perspectives.

Further, to secure 'high amplitude' in decisions, the process should involve different modes of zooming in and out, between thinking/doing and being.

## THE SOCIAL FIELD THE BIG WE

For a container to be successful, one must pay attention to the commitment of the group, that is, the social and psychological dimensions of the processes: in order to shift the focus from the you and the me to the we-mind of us and what we can create together.

Transformative group processes typically unfold in a tension between chaos and order, and the role of the facilitator is to tune in to the dynamics of the group and sense when there is a need for more chaos and disruption – for example through exercises that stimulate creativity, uncertainty, and generative mindsets – and when there is a need for order, for example through a review of what has been learned so far or through a summary of interim conclusions.

## PROCESS MODELS FOR AND IN DESIGN

Container-building processes can be linear or iterative, and they can span over one or several days. They can be guided by phase models and materials.

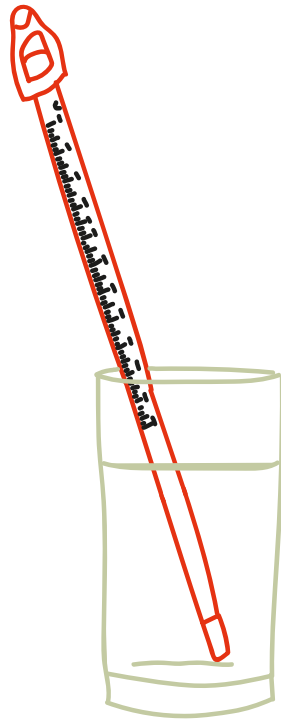
There are models *for*, and models *in* design.<sup>134</sup> Models *for* design illustrate the various phases of the process and serve as roadmaps for how to navigate it. It can either be prescriptive, specific, metaphorical, or abstract.

Models *in* design are materials used to support the processes of brainstorming and prototyping, such as sketches, pictures, illustrations, objects, and narratives – all sorts of materials can serve this purpose. These kinds of models help us talk about and give shape to that which does not yet exist, by creating a shared image of what is emerging in the group and how to get there.

## PLACE DESIGNING THE ATMOSPHERE

The *place* sets out the physical constraints for the creative process. It may be an everyday setting, such as a company's meeting room, or a context that is removed from the organization, such as a park or a forest. The room is *tuned* through the choice of location and its furnishing, including the use of mood-setting props.

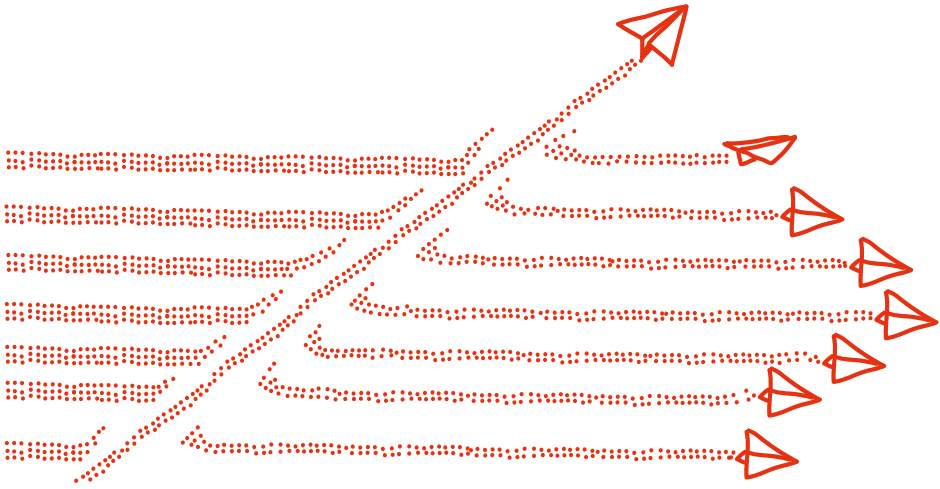
Together with the participants, the room, the objects, and the materials create the atmosphere in which the creative container will unfold. The room and its activities can also be tuned through the ways in which the participants are positioned in relation to each other: 'change the chairs, change the conversation', as the saying goes.<sup>135</sup>



Observing and transforming are linked. In the 1920s, Werner Heisenberg, one of the founding fathers of quantum physics, showed that one cannot observe the world without changing it. Consider what happens when we try to measure the temperature in a glass of water. We put a thermometer into the water, but what we end up measuring is the water's temperature *combined* with the effect of sinking a new element into it, which may be colder or warmer than the water itself. When it comes to container-building, this effect is known as *the simultaneity principle*: it is impossible to start to observe and ask questions about an organi-

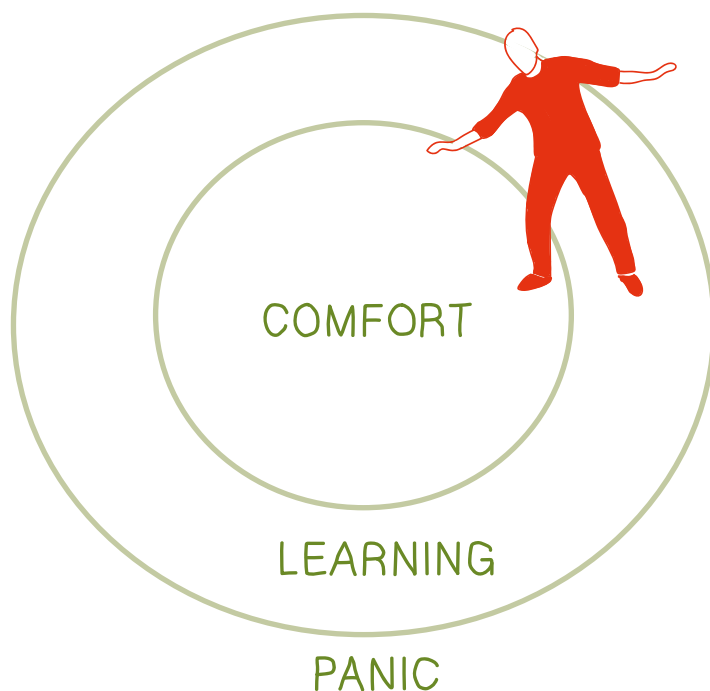
zation, institution, or state of affairs without also beginning to transform it. The exploratory processes and the transformative process are simultaneous, so that asking questions about an organization, or a situation is one of the most effective ways of changing it.<sup>131</sup> As part of the meta-design levels of awareness it is therefore important to consider what needs and values lies behind the questions we ask. What do we hope to change, what is our expectation to outcome? Are the questions focused on the past or on the future, on what is not working or on what can be done differently? What process do we want to set in motion with our questions?





On both the individual and the collective level, successful container-processes are those that challenge existing assumptions by rethinking a given situation, asking critical questions, breaking with the norm, resisting the prevailing structures, and toying with new possibilities. An increasing number of design innovation studies indicate that diverse groups have the potential to produce more creative solutions, due to the more unique combination of the team members' perspectives in new,

creative, and meaningful ways. To be transformative containers should therefore ideally include perspectives and voices that normally go unheard, to help challenge the order that a homogenous group would normally aspire to. These other voices can be intradisciplinary perspectives, employees from other departments, or 'troublemakers' who represent a minority view, thereby presenting different takes on a task, contributing 'crazy ideas', and pushing the other participants to think differently.<sup>132</sup>



Sufficient disruption. As we have heard according to systems leadership theory, disruption is a precondition for change, but a disruption that is either too small or too large will not lead to productive change. In order to achieve the highest possible amplitude between what I have described by divergent and convergent mindsets, the suggestion is to prioritise the incorporation of horizontal and vertical zooming to secure a shift in perspective from one's own interests to the planetary whole and the view-

point of the ancestor. A way of doing this is also to include a heightened awareness of *what is* – in the group dynamic and in the participants' surroundings. What is emerging, what is necessary? In transformative processes, it is inevitable that there will be moments of resistance and negativity, but if we commit to staying with the trouble, then the things we experience as chaos and obstruction may turn into a new form of engagement, expanding our comfort zone into a zone of acceptance.



How do we share? On the practical level, a shared awareness of participants' mindset in a container is about marking the cognitive state in which they find themselves, keeping track of when they must have an exploratory and divergent mindset and seek out new possibilities without censure, and when they must have a synthesising and convergent mindset, making decisions and reviewing their findings. In both states, visual elements can create a shared understanding of

the ideas and goals that the group is working towards. We all know those meetings where each participant was left with a different impression of what was decided. But if the decision is made visual and tactile, it can be easier to create a shared understanding and spatial manifestation of the group's objective. If the visual elements are meaningful for the participants, they may even lead to a state of self-forgetting and flow.

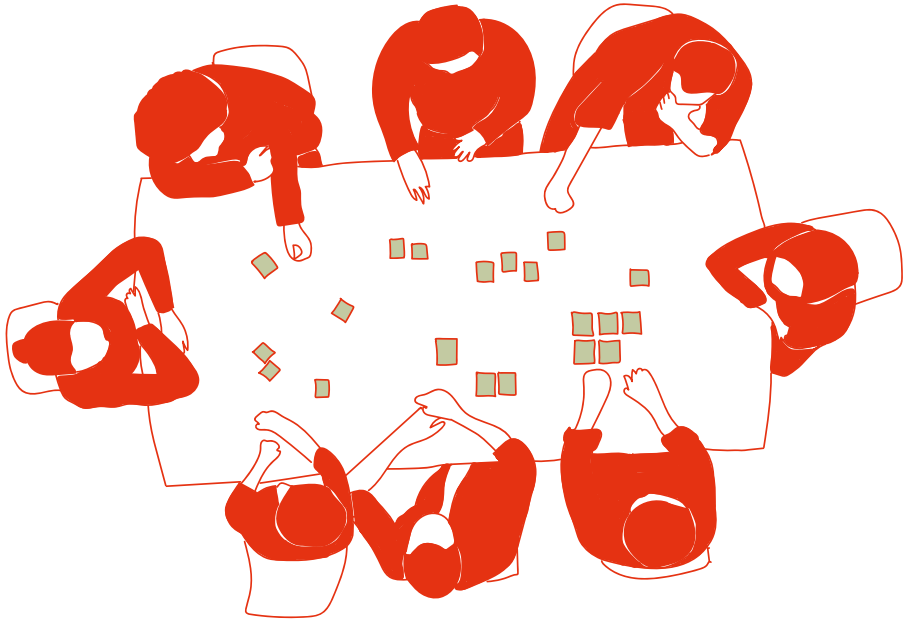
Radical change can only gain momentum through a joint commitment to solving the challenges we face: ‘the Great Work of our age’, as David Orr has put it.<sup>133</sup> Initiatives can happen as both a top-down and a bottom-up movement, and a cross-pollination between disciplines, systems and professions, and it is therefore important to have methods for mobilizing and facilitating collaboration. Container-building is one such method, but many others can be found in the realms of social innovation and activism. In the following, I will focus on two creative approaches to mobilize collaboration in transformative processes: one from the field of co-design, the other from the field of speculative design.

## Co-designing participation

The first example of a collaborative practice to mobilize creative collaboration is *co-design*, which can be somewhat simplistically described as a combination of the rational, usability-oriented approach we know from engineering and software development with the softer approach focused on social and collaborative dimensions we know from process facilitation and design. The field of co-design emerged from the participatory design movement that sprung up in the late 1980s. In its newer versions, co-design is focused on methods that can help us to distribute the design activity in processes of co-creation, where a group collectively explores and creates proposals for a solution, drawing on each participant’s context and background.

One of the foundational assumptions of co-design is that the world is complex and unpredictable, but that collaborative approaches to design can allow us to navigate its uncertainty and create something new by tapping into the contradictory, tangled dynamics that lie within the challenge being explored. Co-design uses some of the

methods that are well-known from design, such as the simultaneous exploration of problems and solutions in a co-evolving process, as well as the alternation between divergent and convergent mindsets, but it also adds new methods for sharing and developing proposals within the group, such as tactile scenarios, design games, narratives and mock-ups.<sup>134</sup>



In some contexts, co-design is used synonymously with the concept of *co-creation*, but they stem from two different disciplines. Ideologically, co-design builds on the premise that designers should move away from primarily working on a commercial basis to actively engaging in the sustainable transformation of businesses, organizations, and societies. Further, co-design aims to engage representatives from the context in which the design solution will be implemented in the entire design process, from the initial exploration

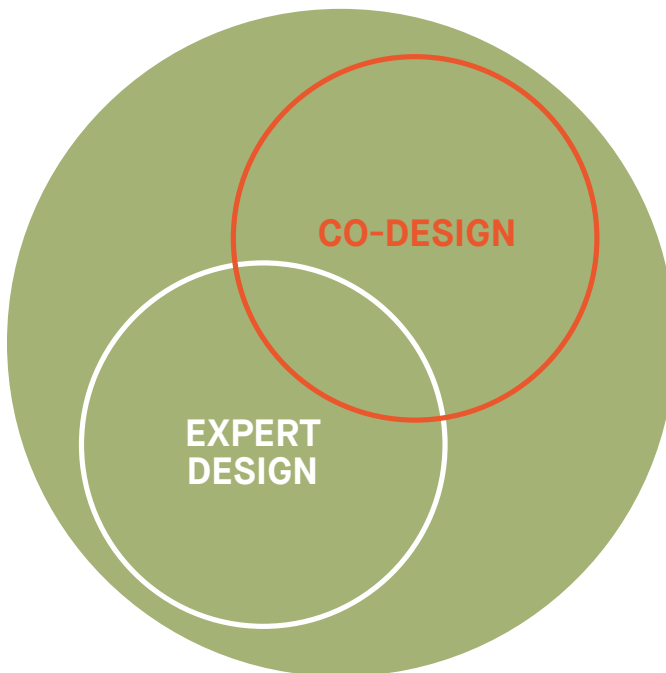
of possibilities through the development of prototypes to the testing phase.<sup>135</sup> By contrast, co-creation stems from an innovation- and marketing-oriented context, and primarily views co-creative processes as a commercial platform on which businesses can meet active consumers and stakeholders to exchange ideas. An example of the latter is the digital platform designed by Nike, where consumers co-create their new shoes by choosing colour combinations, patterns, and the like.<sup>136</sup>

The design theorist Ezio Manzini, who was one of the key players in the development of collaborative approaches to design with a focus on social and environmental innovation, proposed a series of new roles for professional designers, and with them, a new framing of the entire design discipline. In his book *Design, When Everybody Designs*, he proposed that *expert designers*, meaning professionally trained designers and design facilitators, should seek to help groups, communities, and organizations in their prototyping activities, thereby training them in their capacity for transformation. The result of this shared experiment is what Manzini calls *diffuse design*. If performed successfully, this process can achieve socially and environmentally sustainable interventions, where the methods and design help to analyze, distribute and communicate the sustainable aspirations among the participants, institutions and organizations. Manzini argues that this kind of process has both a positive and a destructive potential, using the terrorist group ISIS as an example of a social innovation that had a clearly developed strategy for communication and recruitment, but an inarguably destructive effect. Likewise, new experiments in social organization, sharing economy and business development have resulted in concepts such as Uber and AirBnB, which may have had a positive impact on customers, but also a negative impact on the wider job market, leading to higher rates of precarious employment.

With his broad-based approach to design, Manzini represents a systems understanding of social innovation, in which humans and organizations play a key role in driving social change. Likewise, the design theorist Anna Meroni speaks of *creative communities* to describe social innovations that emerge among regular citizens, often in collaboration with grassroots organizations, entrepreneurs, local institutions, and civil society organizations. Examples include locally based childcare services, new forms of neighbourhood help and knowledge exchange, car-pooling systems, community gardens, and social networks that connect consumers directly to food producers.<sup>137</sup>

It is precisely the participatory nature of co-design and similar approaches that can ensure the transition from container-building acupuncture to a wider diffusion of the creative product. Of course, as in all forms of container-building, this diffusion presupposes that the ideas or solutions that are hatched in the creative process can be distributed and implemented in the organization afterwards. Sometimes, this diffusion may require several container-processes within the same organization or local context to succeed. Furthermore, there will always be that special X-factor in a design process that is difficult to predict and still more difficult to control: that unknowable set of variables which determines whether the impulse for change will in fact influence, transform, and even disrupt the given organization, market, sector, political environment, city or the like. Each impulse for change will have always varying degrees of urgency, impact, and likelihood of success, and if it strikes the organization at the 'right' time, it can create large and long-lasting change, but if it arrives too early or too late in relation to the organization's development, it can be difficult to achieve the desired effect. Part of the work of developing and facilitating containers is thus also about sensing whether the surrounding 'larger system' is ready for the 'small system' of the creative process, and vice versa: Are there particular areas the two might meet and begin to interact, interfere, and resonate?

## DIFFUSE DESIGN



In *Design, When Everybody Designs* Ezio Manzini proposes a model for developing platforms for shared design practices focused on social innovation and sustainable transformation. Expert designers act as facilitators of creative processes carried out by ‘non-designers’, such as citizens, communities, and organizations. The process is called *co-design* because it actively involves the users

and stakeholders to make sure that the product of the creative process is integrated in and makes sense for the context where it is to work. If carried out successfully, this co-design process can lead to a *diffuse design*, design performed by everybody and in which communal local efforts can make organizations, institutions, and social gatherings into platforms for sustainable innovation.<sup>138</sup>

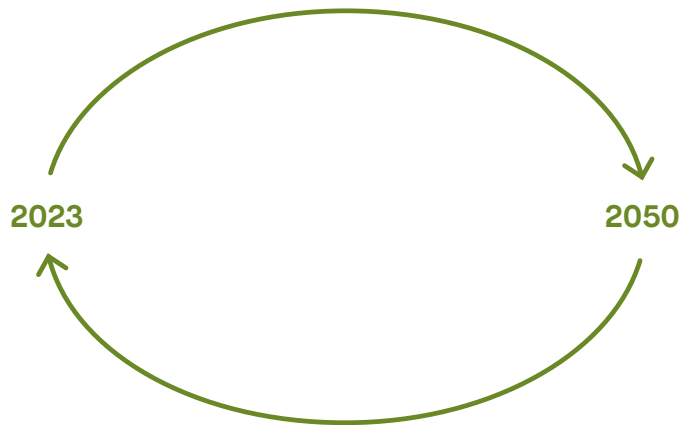




‘Let’s change the world together.’ The US-based activist design group Not Impossible has worked on creating a framework for radical cooperation by establishing what they call ‘never-been-built solutions’. ‘Consider starting with one person’s one challenge’, as they declare on their website: ‘a wrong that you can help make right.’ Through funding from and cooperation with private companies, they have established Not Impossible Labs that work on developing progressive solutions. An example of a challenge they worked on is the scarcity of vaccination in third-world countries. Not Impossible teams launched a project in Sierra Leone, where one out of five children does not have access to basic vaccines. Often, this is not because of a lack of vaccines, but because the children live far from a healthcare clinic, a problem NGOs

call ‘the last mile’. Not Impossible worked with the vaccine-producer Pfizer to better understand last-mile challenges, examining typical problems that stand in the way of vaccine distribution, especially the unreliable road network and the frequent floods. They are currently trying out a number of different solutions, for example using lightweight boats to transport vaccines and setting up more local centres. Another example of a radical design problem is Not Impossible’s use of 3D printers to produce prosthetic limbs for the victims of landmines in Sudan, teaching the locals how to use the printers themselves.<sup>139</sup> These examples illustrate the ideals that lie behind collaborative approaches to design: using co-creation to make concrete and context-specific solutions.

The other example of a collaborative approach to design, that is useful for mobilizing collaboration in transformation is *speculative design*. The concept was first developed by the design theorists Anthony Dunne and Fiona Raby and is often used synonymously with concepts such as *future design* and *design fictions*, though the latter cover a wider range of theories and methods to envisioning future possibilities.<sup>140</sup> What they all have in common is a desire to take design out of the marketplace and into the realm of the unreal and the fictional, working in the tension between reality and the (im)possible. The goal of this approach is to invite a critical reflection on the future that can in turn inform decisions in the present. Speculative design offers an alternative to traditional approaches such as strategic foresights and infographics pretending to predict the future. In speculative approaches, the goal is instead to evoke empathy with the future: What would it feel like to be human in this future world? These questions aim to make the future a more tangible place, not a distant unknown, but a forum where we can exchange ideas, suggestions, decisions and images of what might be a possible tomorrow. At the heart of the various versions of speculative design is ‘What if?’ scenarios that seek to create an open room for discussion and shared creation. In the context of sustainable developments, the questions that can be asked include: What kind of future do we want? What would be the environmental consequences of this or that decision? What are the most grotesque or dystopic scenarios for five, ten, fifty or five hundred years in the future? What can we do today if we care about tomorrow? By creating speculative futures, possibly including prototypes or props illustrating those futures, we make it easier to share our visions and set up imagined scenarios, worlds or characters we can identify with, and which may guide our dialogue and decisions going forward. The purpose of the exercise is not to predict future trends, but to create an empathy with future possibilities.

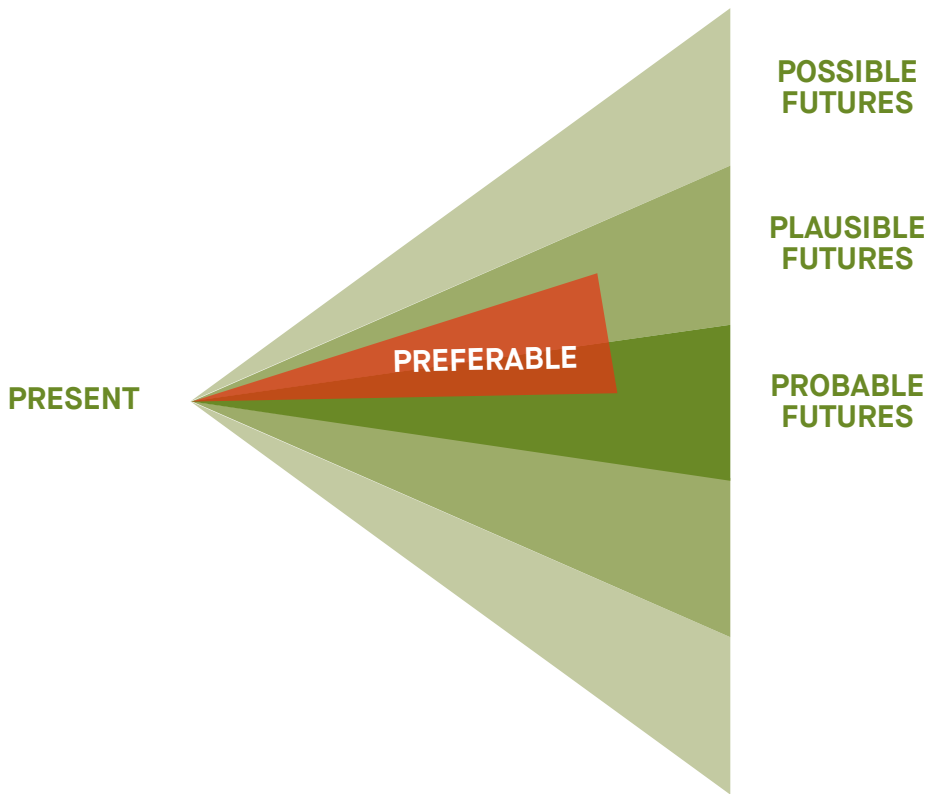


Take a trip forward in time: What would happen if ...? Can we re-imagine what our businesses, organizations, or private lives would look like, and would that idea affect our current

decisions? How can future-based visions serve as a yardstick to guide, inspire, and evaluate design solutions in the present?

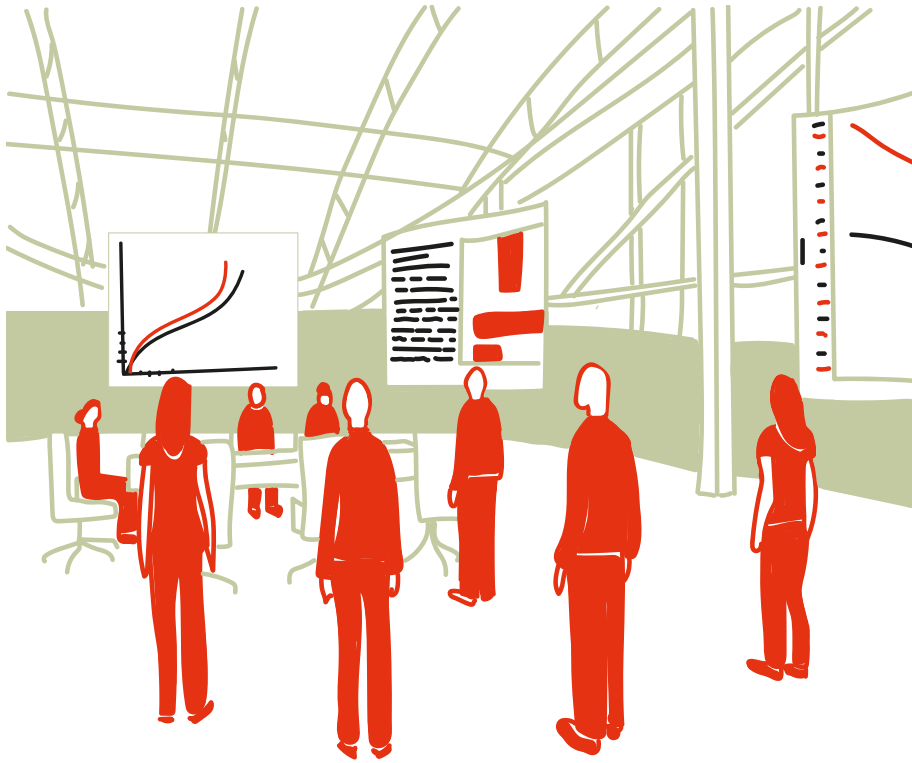
Crucially, this type of process has to begin as a space free from judgment and limitations, based in imagination and a desire for improvement. We must not try to control or fix the future, but to use the envisioned images of the future to reinterpret the present. One way of doing so is by using the three-horizon model discussed in Chapter 3. The design researchers Elisabeth Sanders and Pieter Stappers, who have worked with speculative and inquiry-oriented forms of design, suggest the following three-fold division of time: the world as it is (the present), the near future (five to ten years from now), and the speculative future (thirty, fifty or a hundred years from now). In this understanding, the future is seen as a set of possibilities growing out of seeds that are planted in the present. The tensions and contradictions between past, present, and future also serve as a melting pot from which new scenarios and possibilities emerge, with design acting as a kind of creative bridge between the three.<sup>141</sup>

According to Dunne and Raby, potentially every aspect of society can potentially be the object of speculative thinking. The central premise of this theory is that speculative design is collaborative, taking place in a dialogue between designers and a public or an expert audience: *social dreaming*, as Dunne and Raby call it in their ground-breaking book *Speculative Everything: Design, Fiction, and Social Dreaming*.



What is our preferable future? In speculative design, one typically works with a taxonomy of futures, showing multiple possible paths of which some are merely possible, some are plausible, some probable,

and some preferable. This way of thinking about futures in the plural changes our understanding of what will come, from something that happens *to* us to something we can shape ourselves.<sup>142</sup>

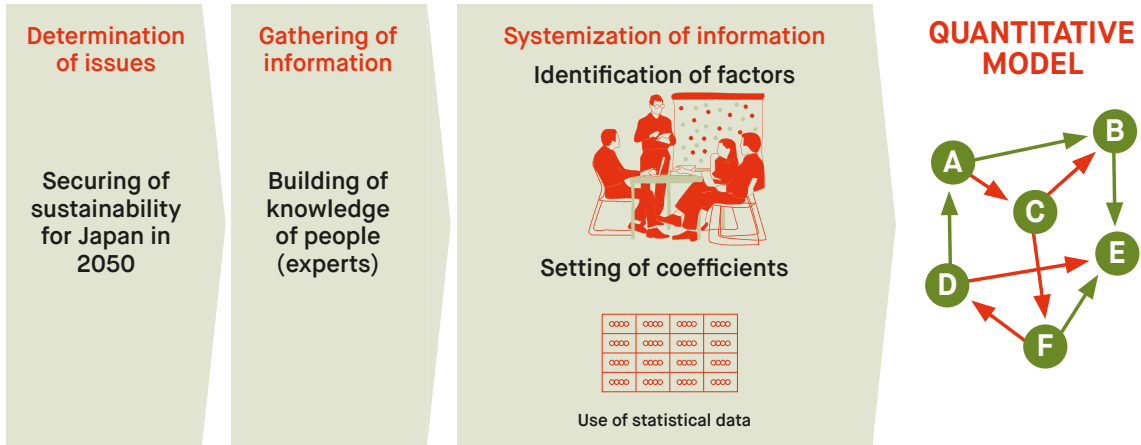


One approach to *social dreaming* is to let the participants ‘rehearse the future’ together, by developing scenarios for how something could be done differently in the future.<sup>143</sup> Take for example the layout of a workplace. The shared exploration will be based around the question ‘What if?’ and seek to stimulate the communal imagination of the participants. The question acts to frame the task, shifting the focus from existing conditions and potential challenges to future possibilities. For example, how can we break with the hierarchical form that usually shapes our organization and decision-making? What if we set

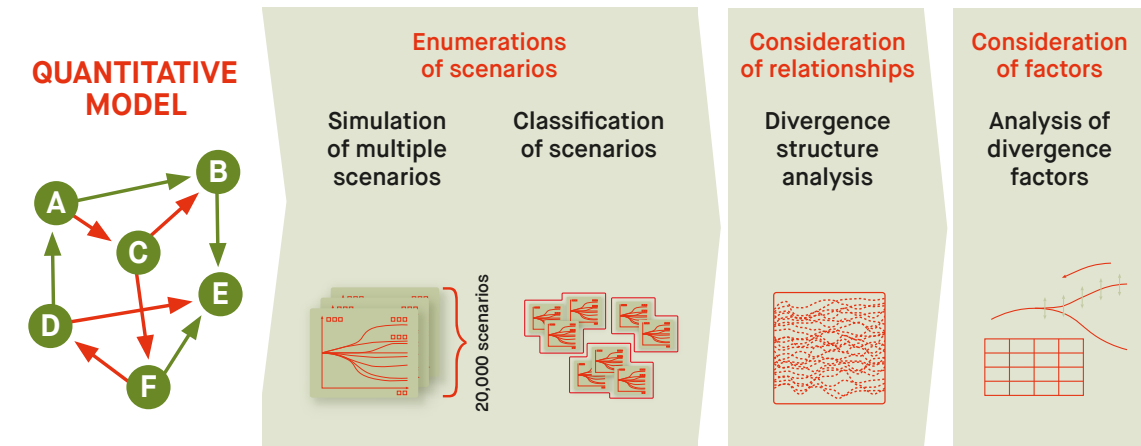
up the meeting room differently, as a circle rather than as an auditorium focused on a projector? What if we developed a digital platform that stimulated more shared communication? In this kind of process, participants who are working hands-on throughout the organization are made to rehearse a possible future, as ‘living prototypes’ experimenting together with how the social space could be arranged differently: moving furniture, making simple models, constructing mock-ups that allows the emerging possibilities to take on form and meaning.

The two examples of design-based collaborative approaches – co-design and speculative design – both offer a practical way to work with organizational and societal transformation. The collaborative nature of the approaches is one of the main strengths that design can bring to the field of sustainable change together with more classic design tools like prototyping and visualization. However, some writers have criticized the supposed naivety of believing that large-scale problems can be solved through design, public involvement, and civil society, not least because it will lead to higher costs, given that the democratic element of public involvement tends to complicate and prolong the process.<sup>144</sup> Certainly, these critical reflections should be part of a broader discussion about the changes that must be implemented for design methods to stay relevant in relation to social and environmental challenges. Manzini for one has suggested that there can be many ways of communicating design ideas: they can be part of a top-down process (driven by experts, decision-makers and political actors), a bottom-up process (driven by local communities), or a hybrid of the two (an interaction between them or a trickle-across effect).<sup>145</sup> More research and practical experiments are needed to create the tools that we can use to work with social and environmental challenges. These tools can be technology-supported, for example by using artificial intelligence to create possible scenarios for the future; or they can be locally based, for example in a neighbourhood context where mock-ups and simple prototypes are used to make alternative futures visually and physically intelligible. On the political-ideological level, these tools can be used to develop regulative legislation or economic incentives. But as noted earlier, we should in all design processes remember that we cannot focus on innovation solely within the scope of already existing fields and disciplines. Given the many stakeholders and complex agendas in these discussions, it is all too easy to forget the larger question of where humanity is headed.

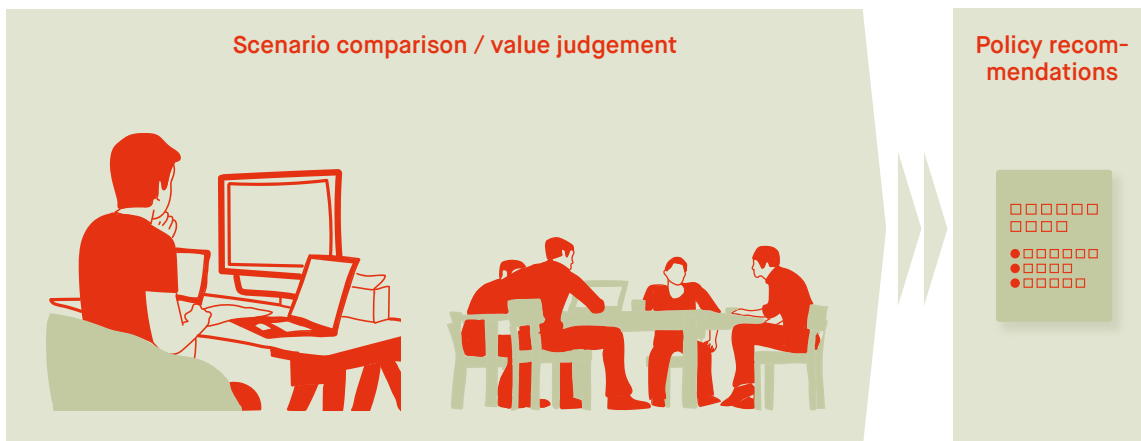
# 1 INFORMATION-GATHERING STAGE



# 2 AI-DRIVEN OPTIONS CONSIDERATION STAGE



# 3 STRATEGY SELECTION STAGE



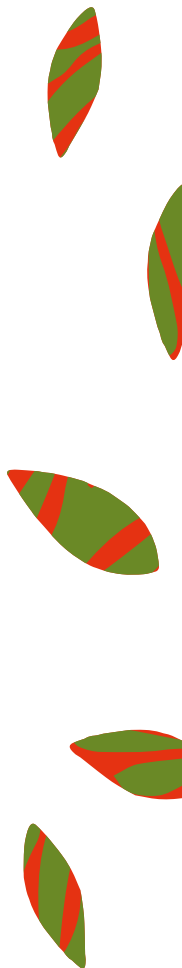


The Hitachi Kyoto University Laboratory project ‘Toward Enabling Ever More People to Live Happily in 2050’ is an example of speculative design. The project was launched in the context of a political incentive to develop possible models for how to achieve a sustainable future for Japan. Researchers in economics, the humanities, social sciences, and information science worked with designers, using AI to develop 20,000 possible scenarios for the future of Japan, on the basis of 159 key measures, both quantitative (such as birth rates, GDP, and CO<sub>2</sub> budgets) and qualitative (such as happiness and perceived wealth). On the basis of these projections, the team developed a series of proposals for how to configure ‘a society with a happy future’. One of the central dilemmas found within these scenarios is the choice between a more regional-decentralised

and a more urban-centralised scenario, and the models showed that by far the most positive tendencies could be found in a more regional-decentralised social structure. The AI simulations allow politicians at both the national and regional level to test the long-term effects of various initiatives, such as a radical expansion of collective transportation. The project is still under development, and it requires continuous testing of which measures the simulations should assign the most weight, and how these measures interact with one another. The image shows a series of procedures leading to policy recommendations: in the stage where various choices are being considered, AI technology is used to carry out simulations and analyses, which is followed by a mapping of the enormous amount of scenarios and reflections on the relations between them.

To become utopian is another example of system acupuncture at the meta-design level. It is an explicit break with the nihilistic and dystopian trends that have dominated postmodern thinking since the late 1970s. Announcing the breakdown of grand narratives – such as religion, ideology, and even history – also meant abolishing any system of thought that could allow for utopian thinking. Postmodern philosophy turned out not to be the end of history, but utopian thinking remains a difficult path to tread. It is still unfashionable to present long-term visions for a better world, and those who present big dreams for the future are often dismissed as dreamers, idealists, or fools. But as author and activist Naomi Klein points out, ‘it is important to avoid falling too much into dystopia when depicting the future. That will only end up making us feel paralyzed’.<sup>146</sup> And since we already seem to be paralyzed by climate change, this is the exact problem we need to address. The most important knot to untie when it comes to systems acupuncture is the dystopian, nihilistic idea that ‘anything goes’, since this idea undoes our sense of our shared responsibility. Utopian and dystopian imaginings often go hand in hand, but it is our duty as individuals, organizations, societies and as a species to try to be utopian. Our utopias need not to be written in stone: they will change in form and direction as we learn. Creating the future never ends.

To become utopian is about insisting on positivity as a fundamental value – as our meta-design, the ideal before or behind our design. It is about insisting on social dreaming, whether the end result is design, art, film, or fiction. One example of a new genre that works explicitly with positive dreaming is *Solar Punk*. In recent years, Solar Punk has been spreading across Europe, USA, and Asia as a form of speculative design within experimental art, activism, and design fictions. The origins of the movement can be traced back to the science fiction



and cyberpunk of the 1980s, where advanced technology merged with punk's 'No Future' attitude to create dystopian settings. Solar Punk, however, reverses the attitude by insisting on radical optimism, based on the idea that dystopian imagery is purely a projection of our current fears and zeitgeist.<sup>147</sup> Imagining a dark (or non-existent) future can be cathartic but it also limits our scope for imagining alternative futures. Solar Punk refigures the now by imagining radical changes in societies and values, describing a world where our current challenges have been solved through social transformations, moral growth or technological empowerment.<sup>148</sup> Other examples are concrete prototypes where existing technologies, such as renewable energy, urban agriculture, or organic architecture demonstrate radical approaches to urban development, such as the spectacular Supertrees and Gardens in Singapore or the Vertical Forest in Guangxi (see page 83).





License to dream. To create new visions for a sustainable world, we need the freedom to dream. One way of achieving that freedom is to facilitate creative containers, labs, or pop-up initiatives in both public and private organizations. The toolbox for these containers should include methods

from design and design thinking, to create visual narratives, creative spaces, and what-if scenarios. The overall objective is not to reach decisions or delimit the future, but to dream big and ask what future we would like to invent together.

## In the making: How to

In the following, I present two cases where organizations used social dreaming as a driver for transformation through design. Both cases come from Danish organizations and reflect the transition that Denmark has undergone, from a design nation with a solid heritage of furniture and high-end industrial design to focusing on transformations within companies, organizations, and society. The first case, Ørsted, is headquartered in Denmark, but it is a global company in the energy sector. Over the past decade, Ørsted has gone from black to green, oil to wind, using design to facilitate the transition. The second case, the Danish Design Center (DDC), is the national agency for the promotion of design. They have recently shifted their focus from promoting the use of design and designers in industrial product development to promoting green transformation in companies and society – that is, from products to systemic and political change.

### Mobilize collaboration: Ørsted – Let’s create a world that runs entirely on green energy

In 2021, Ørsted was chosen as the world’s most sustainable energy company by the Corporate Knights’ Global 100. The climate organization CDP includes Ørsted on the A-list of global companies working with climate change. Over the past years, Ørsted has transitioned from producing gas and oil to becoming the world’s leading provider of wind energy. As a part of this process, the company changed its name from DONG (Danish Oil and Natural Gas) to Ørsted, after the Danish physicist who discovered electromagnetism in 1820. Ørsted assumed its position as a world leader in green energy by reducing the cost of energy from offshore windmills to the point where sustainable energy is a competitive alternative to coal, gas, and nuclear power.

This transformation is radical, and many causes and consequences could be highlighted, but three aspects are particularly relevant here. First, like the turning of an iceberg, the transition was first slow and hidden, then suddenly brisk. DONG had prepared for the transition for years while still producing oil and gas. Container-building was actively used to incubate ideas and develop products and technologies. At the highest level, management promoted visionary and innovative ideas by granting a free space for groups to experiment with ideas. The goal was to go all-green as soon as the six-year forecast made it probable that the price of offshore wind per kilowatt was equivalent to the price for coal, which happened in 2021. In 2018, offshore wind was cheaper than any other energy source except onshore wind. With this strategy in mind, the management prepared a thorough disruption of the whole company, investing in and shielding development while planning for a brisk transformation to become the world-leading producer of sustainable energy.

Second, Ørsted broadened its scope from producing green energy to actively promoting offshore energy production. Ørsted has become a leading consulting agency in all things related to offshore turbines. With a focus on user-experience design, they have designed interfaces and tools that allow highly specialized workers to transfer knowledge about placing and maintaining windmills. The explicit goal is to ‘digitalize tacit knowledge’, ensuring that intuitive knowledge and bodily experience is transferable to employees and stakeholders.

Third, Ørsted used design and branding as a strategic tool during this process of transformation. To the outside world, Ørsted has told the story of going green as a way to reshape the company’s position. But internal branding has been equally important, promoting new values and initiating changes to the company culture. Ørsted has worked with the Danish design company Kontrapunkt, involving employees at all levels to secure a strong sense of community and shared owner-

ship around the transition, and especially around the company tagline: 'let's create a world that runs entirely on green energy.' Ørsted's transition shows how design and design thinking can be used to boost motivation and create engagement around sustainability on a planetary level and in a corporate setting.



Above from the left, Ørsted's system innovation map, that shows the company view on a future energy market. Besides that there are three corporate levels of design thinking:

1. Digital production focused on user experience design in products and services.

2. Business strategy exploration concerned around new ways of organizing work and optimization of programs.

3. Long-term vision focused on strategic opportunities for the company in the coming years.

The Danish Design Center (DDC), Denmark's national centre for the promotion of design, has worked intensively over the past years to develop a series of future scenarios to encourage discussions among private and public organizations about their role in social development. In the project 'Boxing Future Health', the centre examined some of the major challenges facing the Danish health sector, including an ageing population, structural changes and the emergence of new technologies. Over a one-year period, DDC carried out future labs with a hundred experts as well as representatives from public health institutions and private health companies, exploring possible strategies for the health sector in the year 2050. The results of the workshops were summarized in four scenarios, illustrated with the headings and keywords shown on page 212. Further, the scenarios were given a visual and tactile form: four large cylinders where people could come in and feel, smell, and listen to the alternative health futures, brought to life by actors playing the role of various personas, such as a chronically ill 84-year-old man and a modern businesswoman with a broken leg. Using these four scenarios as a starting point, DDC then carried out a further round of future labs with more than 3000 participants, who played with and discussed the various challenges and possibilities within the health sector. Unlike more traditional predictions or prognoses, these speculative design scenarios create qualitative narratives that make it easier to explore future fields of possibility in more complex ways.





The Boxing Future Health project of the Danish Design Centre combined the methodologies of scenario-building and design to power collaborative explorations across the private and public sectors in the healthcare space of Denmark. The result of the co-creation processes was four distinct visions of health in the year 2050 in the form of four tactile

future scenarios, one in each of the quadrants of the two key dimensions: the notion of health and the organization of healthcare in the future. The scenarios were transformed into four tactile physical installations and audio narratives from future citizens. Physical installations participants could walk into, immerse themselves in, and explore.



## MOST FOR MOST

### KEY WORDS

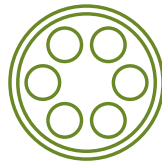
Consensus, accepting limits to treatment, stability, efficiency, prioritization, security.

### NOTION OF HEALTH/DISEASE

Health is the absence of disease. Disease is a part of life and can affect anyone. Society should make healthcare services available within the allocated budget.

### ORGANIZATION OF THE HEALTHCARE SECTOR

Healthcare is a core part of public welfare services, and the healthcare sector is a safety net that offers the citizens security. Experts make tough, knowledge-based priorities concerning new medicines and treatment options to ensure the widest possible coverage within a reasonable budget.



## HEALTHY I

### KEY WORDS

Focus on health technology and breakthroughs, individualization, market-driven, dynamics, individualized approach, digitization, globalization.

### NOTION OF HEALTH/DISEASE

Health is physical and mental well-being. It is an individual responsibility to stay healthy and to make use of the technological options in the market to maximize one's physical and mental fitness.

### ORGANIZATION OF THE HEALTHCARE SECTOR

The commercial market for healthcare services is in rapid growth globally, digitally, and dynamically. The public healthcare sector benefits from innovation in the commercial market but mainly provides basic services and may be compared to other public utilities.



## MINISTRY OF ROOT CAUSES (MORC)

### KEY WORDS

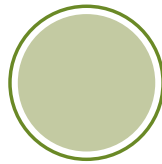
Basic conditions for health and disease, healthcare as a public responsibility and a broadly anchored culture, holistic mindset, sophisticated preventive efforts.

### NOTION OF HEALTH/DISEASE

Health and disease manifest in the individual, but there is a consensus that their presence is essentially a product of the basic conditions. Society should accommodate people, not the other way round. Breakthroughs in epigenetics, big data, and artificial intelligence (AI) are key drivers of progress.

### ORGANIZATION OF THE HEALTHCARE SECTOR

MORC sits at the head of the table in connection with policy development, and health policy issues are integrated in all policy areas. Big data, AI and the involvement of municipalities, local communities, businesses, and volunteers help anchor and generate progress.



## HEALTH BAZAAR

### KEY WORDS

Growing awareness of health, new paradigms challenging the biomedical paradigm, search for meaning, individualism, global, digital grassroots, networks, providers.

### NOTION OF HEALTH/DISEASE

Health and disease go beyond the body; they are an aspect of life itself. We strive for meaning, wholeness, connectedness. The biomedical paradigm is challenged by many new approaches and parallel answers, which leads to fragmentation, tension, and conflict.

### ORGANIZATION OF THE HEALTHCARE SECTOR

The public healthcare sector is challenged and supplemented by alternative approaches. There is a wide range of grassroots options in civil society as well as in the marketplace.

So far, my suggestions for performing systems acupuncture rest on a positive, confident view of the world, based on the widespread desire for change that we see around us. Optimism is itself an important driver, but in our current situation, it has to be complemented by a sense of urgency. We need radical change, sooner rather than later. No matter what politicians decide to do, we will soon face extreme changes in our environment. Our carbon footprint is still getting bigger. Even if all emissions stopped today, it would take many years before the concentration of greenhouse gases in the atmosphere would begin to decrease.

The preparation for the new situations that will inevitably arise has been called transition design. It is a new field, emerging from social innovation and other design fields that challenge existing socio-economic and political paradigms through speculative design, scenario development and future casting. The aim of transition design is to facilitate discussions about alternative futures and ways of being in the world. Typically, they involve a thorough re-thinking of entire lifestyles, including a re-imagining of socio-technical infrastructures, business, energy resources, the economy, food, healthcare, education, and so on.<sup>149</sup> Transition design involves long-term thinking and is based on the premise that the natural world is the greater context for all design solutions. Gideon Kossoff originally proposed the concept in 2011, arguing that the transition to a sustainable future is a design process that requires vision, the integration of knowledge, and the need to think and act at different levels of scale. It is also a highly contextual process, involving a deep awareness of relationships, connections, and physical space. Kossoff was inspired by the environmentalist Rob Hopkins and his 'Transition Town Movement' in Devon, which worked to create resilient local communities.<sup>150</sup> As a research field, transition design aims to link and leverage individual projects within service design and social

innovation, so as to form more effective transitional steps toward a desired future.<sup>151</sup> I see transition design as encompassing both large-scale efforts to imagine possible futures, such as the Danish Design Center's work on health care (pp. 212–14) or the work of Hitachi University (pp. 204–05); and local efforts to prepare for extreme weather or rising water levels, as we see in the Netherlands (see next page). For centuries, the battle against the sea has shaped the country's geography, but as the seas begin to rise, this battle will have to be rethought. Is the Dutch government to import billions of tons of sand and build up higher coast lines, create artificial breakwaters, and essentially dam up the North Sea with a series of water locks, fighting for every square foot of land? Or are they to 'welcome the sea', as the Dutch climatologist Marjolijn Haasnoot has put it, by keeping the dikes at their present level and allowing the water to seep into less populated areas?<sup>152</sup> Many Dutch environmental researchers speak of a 'controlled retreat', which would include rehousing parts of the nation, building more stilt houses, and relying on less agricultural land.<sup>153</sup>

It goes without saying that time is a problem. We need to address challenges at the global level and create a new vision and direction for humanity to minimize harm at the national and regional levels. But urgency can also stifle action and we need hope in order to cope with the challenges, maintain our sense of direction, and keep open a mental space in which to carry out our creative process.

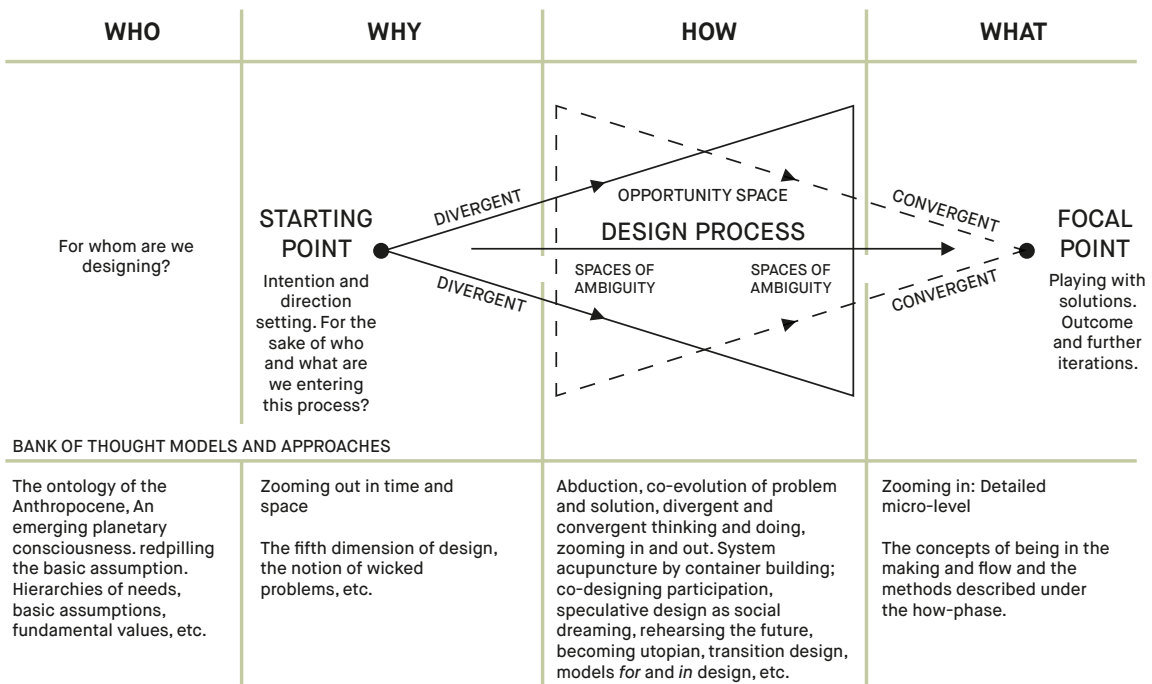
In *Hope in the Dark*, essayist Rebecca Solnit writes of hope that 'it is not the belief that everything was, is or will be fine'. Hope is not a reassurance that there is nothing to worry about. 'The hope I am interested in', Solnit writes, 'is about broad perspectives with specific possibilities, ones that invite or demand that we act'.<sup>154</sup>

This is the kind of hope, I hope to infuse by this book, by providing thought models to mobilize action.



Besides speculative projects and diverse examples of scenario building we have for the last year also been witnessing initiatives focusing on *Transition design*, based on an understanding of the interconnectedness and interdependency of social, economic, political, and natural systems.<sup>155</sup> In the context of transitions, policymaking is essentially designing a new future, meaning that we must consider a design activity at any level of the socio-technical system in relation to design activities at all the other levels. We must also acknowledge that while design can be both diffuse (undertaken by anyone as part of their natural human cognitive capacity) or expert-led (undertaken by design professionals), the bound-

aries between the two will often become blurred in actual transition processes. One element of transition design is the global consideration of how humankind can prepare for the changes that will unavoidably befall us as a result of climate change. Another element is the local levels of transition, for example the handling of climate adaptation plans as we see here with Amsterdam landscape architects preparing for new battles against the sea, drawing up futuristic plans for permanently flooded areas, raised bike paths, and public spaces that can serve as either playgrounds or water retention basins. This sketch is by the architects Floria Boer and Marco Vermeulen from the Dutch architectural firm De Urbanisten.





The illustration on the opposite page extracts models and approaches from the book's Introduction to chapter 5. The intersected triangles of divergent and convergent thinking and doing is the generic design process model where modes of reflection and action can be repeated throughout the process from the starting point of intentions and direction setting over exploration and play with possible solutions to outcome. Sometimes this will require a jumping back and forth many times between the different phases of divergent and convergent thinking and doing, of abstraction and concrete prototyping while moving towards a greater degree of concretization.

The first part of the model suggests a stepping back as a fundamental re-framing of the design process, before narrowing down the specific intentions and goals of a project or challenge. I call this the *Who*-phase of the process and it can be seen as synonymous with the meta-design level, guided by questions as, for the sake of who and what are we entering this process? This phase can be inspired by strands of thought from the Introduction to Chapter 4 and 5. The phase can also be inspired by approaches from Chapter 4 and 5 about the hierarchies of needs, the redpilling of the basic assumptions, the lilypond metaphor, the idea about the impact of values and culture. The next phase of the model puts focus

on the need to zoom out in time and space. I call this level the *Why*-phase, and this can be guided by questions such as why are we doing this? Why is it important or necessary? The *Why*-phase can be inspired by the notion of the fifth dimension of design in the Introduction, the wicked problems of Chapter 2 or the zooming in and out frameworks of Chapter 3. The third phase has to do with the specific approaches we can use to work with the hyper-complexity of design processes. I call this the *How*-phase. It can be inspired by methods from Chapter 2, e.g., abduction, divergent, and convergent thinking or Chapter 5, e.g., system acupuncture by container-building, mobilizing collaboration through disciplines such as speculative design, co-design or transition design, models for and in design, etc. The fourth level of the model is the *What*-phase. It is focused on the process of playing with solutions and outcomes. This phase can be inspired by approaches as zooming in at the convergent detailed level described under the how-phase in tandem with concepts as being in the making, and ideas about presencing and flow of Chapter 3.

The approaches suggested are selected examples. There are of course myriads of other disciplines and processes that can be used to ignite systems-level change and catalyse sustainability transitions.

The purpose of this book is to help set a new agenda for a sustainable development of design, by shifting our focus from products and outcome towards the planet, the greater whole, our underlying values and being itself. This shift calls for a re-framing of the very premises that we design from, that is, the meta-design-level.

**The meta-design level** comprises the fundamental worldview, values and fundamental level of consciousness – the onto-epistemological assumptions – that lie beneath our decisions and actions in design. This fundamental worldview frames our entire perception of reality, and with it, the intentions behind our designing. If we change the worldview, we will change our ideas about *why*, *what*, and *how* we design.

I propose two points of entry into the new level of meta-design: the Anthropocene and Planet Design.

**The Anthropocene** is a room for imagination and discussion, a bottom-up perspective that allows us to see ourselves as part of a bigger force: a species with enormous reach. The Anthropocene allows us to understand the world and our role within it in a new light, displaying the intimate relations between the human and the non-human. This new understanding also reveals the dire need for new perspectives on power, prompting us to examine how we handle the privilege of thinking and projecting visions for the future. It also calls on us to reconsider how we can clean up our own mess and carry the burden that we have created.



**Planet Design, or The Fifth Order of Design**, is another way of approaching the new meta-level of design. It focuses on the need to put a definitive end to the homo-centric perspective: no more ‘humanity first’. Instead, we need to be planet-centred, ensuring that design and development at every scale has our living globe as its constant touchstone.

Proceeding from these two perspectives, the book lays out a series of claims, thought models, and concrete tools for working with and thinking about the new foundation for design and design thinking.

### *Big-picture Worldview*

The first claim comes from the fields of evolution, developmental psychology, and systemic leadership theory. I propose that we are on the edge of a new level of consciousness that will be based on ecologic sensitivity, a radical break with the dualistic opposition between humans and nature, and an interconnected, big-picture worldview. This shift in consciousness calls for new ways of leading, developing, and mobilizing for action.

### *Zooming In and Out across Time and Space*

The second claim emerges from the first: in order to change our general perspective in the design process, we need to zoom in and out, consciously considering the level on which we are treating the challenges, all the way from the macro-perspective of a planetary level to the micro-perspective of concrete solutions. I propose that zooming in and out across time and space should become a key element in the design process. It should be a rule of thumb, that if we cannot properly grasp the problem or reach an agreement, then we have not zoomed out far enough.

### *Being in the Making*

The third claim is that, in order for a new consciousness to emerge, we need to realize that *being is a condition for making*. If all we do is doing then we might become efficient machines, but we will lose our sense of existence. To balance doing and thinking, we need states of being. We need this state of being as humans, and we need it as part of the design process. When zooming out, this form of being in the bigger picture can be a way of grasping a totality that escapes words and understanding. And when zooming in again, this form of being corresponds to the flow that we experience when competence and complexity match, and we slide into a state of unselfing.

### *Staying with the Trouble*

The fourth claim is that we cannot work with the challenges we face from within our comfort zone. To let the problem and the solutions co-evolve, we need to move into the complexity, but to avoid losing track, direction and purpose, it is useful to zoom in and out repeatedly. Methods from design and design thinking can help us stay with the trouble and move into the unknown: these methods include divergent and convergent mindsets, abductive serendipity, prototyping, and so on.

### *The Basic Needs, the Basic Assumptions*

The fifth claim is that we need to question the basic needs and assumptions that underlie our design, so as to found in a new level of meta-design. We must ask ourselves whether our design is driven by derivative or doubly derivative needs. We must ask ourselves what underlying values govern our decisions. When we challenge the prevailing systems, we need to be aware of the immune system of our organizations and society, which might very well hit back and make matters worse.

*Creating Change*

The sixth claim is that we already possess lot of knowledge, capacity, and tools to mobilize change. We know the ropes and we can proceed with systems acupuncture to loosen up the system and create change. We know some of the basic assumptions that we must challenge, we know how to build containers to incubate ideas and approaches, we know about social dreaming, utopian thinking, transition design and much more besides.

In the final chapter of the book, we will leave the research- and practice-based domains of design and design thinking, evolution history, developmental psychology and systemic leadership theory to move into another area, the realm of ancient wisdom traditions - a realm which offer no other proof than a relevance and resonance stretching back thousands of years.

*We were made to enjoy music, to enjoy beautiful sunsets, to enjoy looking at the billows of the sea and to be thrilled with a rose that is bedecked with dew [...] Human beings are actually created for the transcendent, for the sublime, for the beautiful, for the truthful [...] and all of us are given the task of trying to make this world a little more hospitable to these beautiful things.*

– Desmond Tutu<sup>156</sup>

# Chapter 6. DesignWISE. How Might We?

*Everything the Power of the World does is done in a circle [...] The sun comes forth and goes down again in a circle. The moon does the same, and both are round. Even the seasons form a great circle in their changing, and always come back again to where they were. The life of a man is a circle from childhood to childhood, and so it is in everything where power moves.*

– Black Elk, Holy Man of the Oglala Sioux<sup>157</sup>



## From human design to planet design

If we look at the history of humanity from a linear perspective, it may seem as if we have moved steadily towards ever greater knowledge, agency and experience. But if we look at it from a circular perspective, it is as if we have moved backwards, especially when it comes to an understanding of and respect for the whole of which we are part. One could argue that a primary reason for the failed empowerment of humankind is that we operate with a linear conception of time. This conception was born with the emergence of agricultural societies, as described in Chapter 1, in which humans began to draw connections between cause and effect and thereby differentiate the past, present and future. One could even say that linear time was the soil from which agricultural societies arose since the cultivation of crops requires an understanding of what will happen in the future: keeping the seed from this year's harvest to ensure next year's meals. The notion of linear time also underlies the great monotheistic religions, Judaism, Islam, and Christianity, which were born in agricultural societies and are all based on the idea of salvation as a future-oriented process. This conception of time was later consolidated, codified and distributed during the Scientific Revolution and scientific-technological advances of modernity.<sup>158</sup> In particular, the promise of growth that is built into every area of modern industrial societies – especially their economy, technology, and production – played a key role in programming the core logic of the current production machine, a logic that could be summarized as future equals progress. This promise of progress was in fact largely realized in the Western world from the 1960s onwards, leading to a still more widespread expectation of endless growth – an expectation in which one could invest. The striking aspect of this conception of time is that it is entirely untethered from the natural world, in which we see only cyclical processes: the rhythm of day and night,

the seasons, the sea's ebb and flow, the moon, the planets, and the stars.<sup>159</sup> In the natural world, everything that emerges and grows is brought back into the cycle of life so as to nourish the newly emergent. With a reference to the metaphor of the design machine one could say that it is time to stop designing in the image of the machine and start designing in a way that honours the complexity and diversity of life itself. In contrast to the linear conception of time that undergirds the socioeconomic theories behind the modern world, system thinking offers a paradigm shift in how we conceive of ourselves and our behaviour in relation to the environment. The system mindset is based on a notion of the interconnectedness of all things, and thus also on a cyclical notion of time in which every action has consequences: what we send out into the world is what we get back; what we do now will cause ripple effects in both the short- and the long-term future. Our forebears before the rise of agricultural societies had a more intimate understanding of that set of interconnections, and this understanding survives in various forms among the indigenous people whose worldview can largely be thought of as an earth-wisdom counterpart to modern system thinking. Today, we say that indigenous people live in *harmony* with nature, but of course, that does not mean that they did not intervene in their natural surroundings: it means that they did so with an understanding of the *effects* of their interventions. For that same reason, they believed that their survival and well-being relied on maintaining good relations with the gods who were thought to inhere in and hold sway over the natural processes on which humans depended. Adversity was thought to reflect the dissatisfaction of the gods, and their interaction with nature was based on the logic of 'fear and respect' as described in Chapter 1. Indigenous cultures were thus highly focused on the *interactions* that their activities affected the world around them. To understand these interactions – and to act on that understanding – is precisely what we today would call system thinking.



It is worth noting that these indigenous people lived in local communities that were restricted in size and scope, and their worldviews were therefore often limited to their immediate surroundings. Further, as noted previously, their relation to nature was often characterized by fear and not least violence, so their world was not simply one of romantic, pre-dualistic bliss. It would therefore be misguided to apply their thinking directly to our own time. However, indigenous peoples did have and still have specialized knowledge that is worth revisiting – we may call it a *silent knowledge* – that has been extinguished and expurgated, but which might be urgently useful for our current society. Today, various indigenous people's understandings of the world are subsumed under the label Indigenous Ways of Knowing (IWOK).<sup>160</sup> It is a knowledge that is intimately connected with the relation indigenous people had and still have to their land, and with the respect they have for their ancestors and future generations, emphasizing their cultural and physical survival as a people. Among indigenous people, there is not a sharp distinction between the people and the land they inhabit, since the land contains the memories of the past and the spirits of the ancestors. One cannot disconnect oneself from the world or place oneself at its centre; instead, the larger whole has to be considered in every act and decision.



Indigenous thinking can help us to understand that we cannot disconnect our consumption of resources from the planet's capacity for regeneration. We cannot simply extend our economic growth by borrowing money from an abstract expectation of future progress, if that expectation

cannot realise it in the material world to which – however much we like to think otherwise – we remain bound. There is only a given amount of global resources; if we forget that, we are borrowing from nothingness, and thus from our own well-being.

Besides their cyclical understanding of time, the ontology of indigenous people is based on what developmental psychology calls a ‘magical’ understanding of the world, as described in Chapter 1, which entails that the physical world is merely an expression of the dynamics that unfold in a larger, hidden, and sacred world that lies behind it. This means not only that one should treat the manifestations of the physical world with respect but also that it is possible to travel into the divine realm: shamans are able to travel between different worlds through practices such as trance, dance, or the spontaneous production of mystical symbols. This worldview is a far cry from the contemporary understanding of reality that is based entirely on experience and observable facts since it allows for the possibility that there are other domains beyond the limitations of human consciousness. This is a possibility that has recently garnered more interest, as described in Chapter 1, with the recent rise in, for example, panpsychism and various forms of animistic thought.

In the context of design and development, the cyclical notion of time that we see in both system thinking and IWOK can be an occasion to ask critical questions about the foundation of our design activity. The holistic view of the world can hold up a mirror to our own way of life, showing that we have forgotten to integrate the indigenous knowledge our forebears possessed. In this perspective, we are all indigenous, as we descend from people who had traditions and ways of knowing and being that were based on a deep understanding of their interdependent relationship with their surroundings. The biggest difference in the behaviour of indigenous people and people in the modern post industrialized societies will come when we stop seeing ourselves as separate to the environment but realize that we, along with the rest of the natural world, are all interconnected, interdependent and interrelated within the larger web of life.

My goal throughout this book has been to raise awareness of the place from which our design proceeds, in-

cluding the consciousness, worldview, and values – the meta-design – that shape our acts of creation. We can begin by asking ourselves whether our ideas are based on a cyclical or a linear understanding of time? What do we want to contribute to the world and to the generations who will succeed us? What do we dream of in the short and long term, for ourselves and those to whom we are leaving the planet? Following in the footsteps of indigenous thinking, we can also ask critical questions about the reality that surrounds us. Is what we take to be reality the only reality that matters to us? Are the values that guide us as clear and incontestable as we generally take them to be? We can begin to ask those questions by opening our minds up and exploring aspects that transcend our everyday categories and our normal notion of reality. We can seek out new boundaries of consciousness and cognition through dreams and myths, being open to the re-enchantment of the world and the return of the fantastical. What might we find in the domains of reality that exist beyond the world that we perceive with our senses, in the other domain of reality from which everything comes into being and into which everything eventually returns? In such a process of exploration, and poeticization of reality, we will necessarily come face to face with things that we do not fully understand, but this confrontation may make us more attentive to our surroundings, the holistic nature of existence, and not least each other. Are there hidden relations we have yet to discover, secret languages that actually control us, enigmatic connections that bind us all together? In our journeys through the mysterious and the paradoxical, we can share feelings and fantasies about what the world could be like. This is ideally a creative process of *thinking outside the box*, consciously pursuing the breaking of the unbreakable correlations between thinking and being that has for centuries dominated our traditional ways of reflection and acting.

*The very origin of the term sustainability can be traced back to The Great Lore of the Iroquois people, and its Seven Generation Principle, considering actions as they affect the seventh generation after them.*

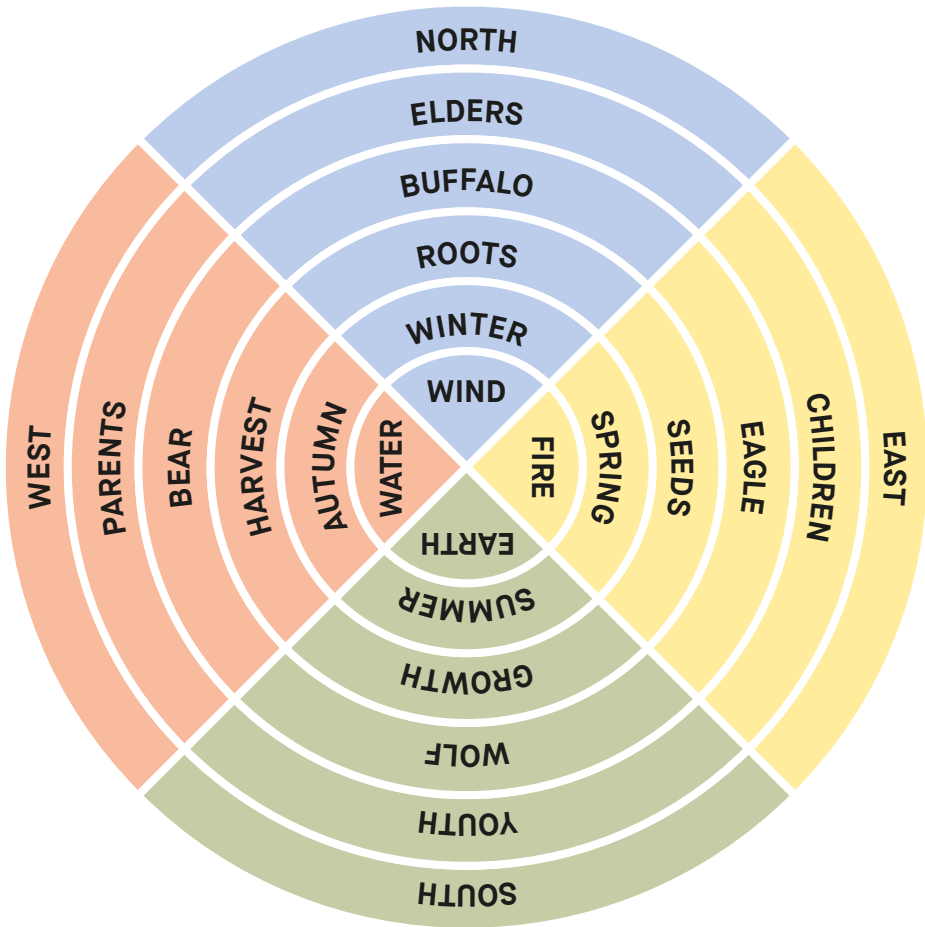
– Julia Watson<sup>161</sup>

## DesignWISE

In what follows, I present a design tool based on the circular, holistic interconnectedness we find in both system thinking and indigenous worldviews. The inspiration for the tool comes from the Medicine Wheel that is found in different versions of indigenous wisdom traditions all around the world, including Old Norse, African, Aboriginal, North American, and newer Western interpretations. What they all have in common is the consistent importance of the *whole*, which is represented by a circle that has no beginning or end. Historically, the wheel has been understood in both concrete and symbolic ways: concretely, circles have been used in ceremonies and erected in natural surroundings, such as the famous ritual henges found throughout England; symbolically, the wheel has been used to describe a hidden connection in the world or within the human body. As a historian of religion, Mircea Eliade wrote of ancient symbols: ‘History constantly adds new

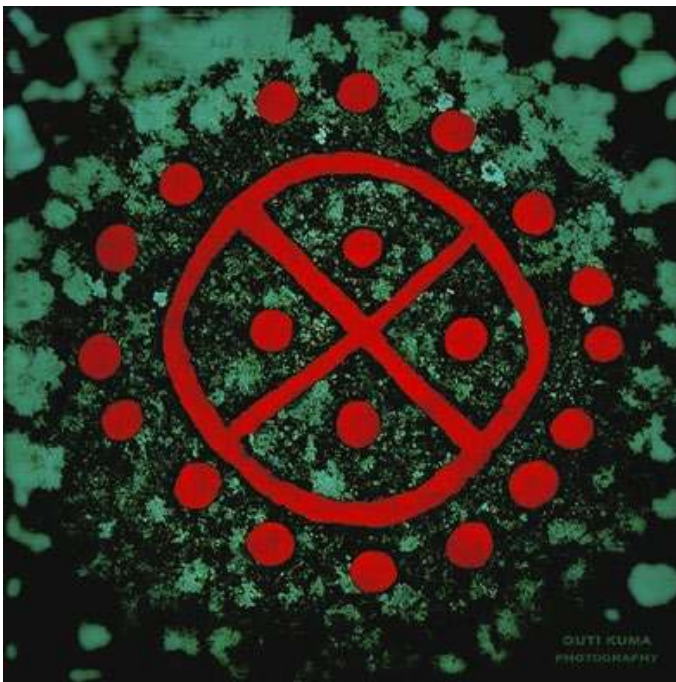
meanings, but they do not destroy the structure of the symbol.<sup>162</sup> According to Eliade, the fundamental symbolic content of the Medicine Wheel has been combined with new meanings as it was adapted to or reinterpreted within a new context, but these new meanings have not effaced its original significance. The Medicine Wheel is thus both an *integrating symbol*, since its basic symbolic content organizes a whole set of practices and values, and an *elaborating symbol* since it can be filled with new meaning and thereby adapted to a new context.<sup>163</sup>

As such it can be seen as a matrix of regenerating endless applications, new wheels, new processes, and new wordings. In the following rendition of the Medicine Wheel, the goal is to see it both as an integrating, holistic, relational map of wholeness, as well as a process guide for cyclical ways of thinking, learning, designing and living in a planetary context. In the current adaption, the circle symbolizes both a field of possibility without beginning or end and an ambition to integrate a circular perspective into all design decisions. It also signifies a holistic, qualitative, 360-degrees understanding of all aspects and approaches that pertain to a given challenge or solution. In the wheel, the whole is always manifest in each of the parts, and all the parts exist as instantiations of the whole.



The Medicine Wheel exists in many versions. The image shown here comes from North America and is connected to specific tribes; but the powers of the Sacred Four are universally recognized in native traditions, as they relate to the cyclical path of the sun during the day and the year and to one's belonging to the land. Dwellings were therefore built according to the four cardinal directions, as a form of essential sacred architecture. In this way, the

four stations of the day and the four seasons (particularly the equinoxes and solstices) could be observed and honoured. In the version of the wheel shown here, the quadrants correspond to the four cardinal directions, the four seasons, the four elements, the four ages (childhood, youth, parenthood, old age), four animals (eagle, wolf, bear, buffalo), and four phases of plant cycles (seeds, growth, harvest, roots).



The structure of the wheel cross can be found in many variants across the globe. This representation comes from the Danish island of Bornholm, from the site Madsebakke, which is

known for its many rock carvings dating to the early Bronze age. This sun cross is also surrounded by sixteen dots, which probably indicate cups for offerings.



One of my mentors in earth-wisdom traditions, Chris Lüttichau, writes about the circle in the Medicine Wheel:

The circle with a cross through it is the old, universal shamanic symbol for the cosmos: the circle of life. Apart from representing the macro-cosmos it also represents the micro-cosmos, such as a human-being. The circle of life tells us that we are a reflection of the Universe and made of the forces of nature: as above, so below.<sup>164</sup>

An important fact about the Medicine Wheel is that its dimensions and wisdom cannot be grasped merely by reading about it: one cannot communicate these insights through a book, an article, or a film. The wisdom of the Wheel has to be practised through a personal journey across all the phases of the wheel, over several and potentially infinite iterations: according to earth-wisdom traditions, this journey through the Wheel never ends, not even in death, since it will unfold over and over across countless lifetimes. Learning the deeper meaning of the Wheel thus requires patience and perseverance, which is one reason why wisdom traditions usually do not impart their practice in writing, but only through the oral transmission of a teacher, shaman, earth-wisdom keeper or the like, who has been initiated into the performance of indigenous medicine.

I am still at the beginning of my journey, having travelled only a few years with my teachers, Peter Tillge, Eva Dinesen, Outi Kuma, and Chris Lüttichau, but I have experienced enough to be certain that the integration of the Wheel's insights into the field of design has enormous potential. For that reason, I have adjusted the Wheel and given its phases and dimensions new names, which I believe make it more suitable for the kind of practice I want to pursue with this book. In bringing earth-wisdom traditions into the world of modern design, I am not arguing that we should somehow return to a pre-industrial society or a world before modernity's 'fall': we are still

moving through the same evolutionary journey, and we must find a way of creating and designing in this phase of the journey. In other words, I believe that past and future, innovation and tradition are not opposite forces: in a cyclical understanding of time, they are each other's precondition, and the system of one must be reflected in the system of the other. Innovation must be integrated into the tradition within which it unfolds, and the tradition must welcome innovation to stay alive. One can argue that ever since the emergence of agrarian societies, we have sought to disconnect ourselves from and make ourselves the masters of the processes of the natural world, both those around us and those inside us – a naïve project that naturally failed. We can only hope that the insights from system thinking and IWOK can help us to realize how impossible it would be to separate ourselves from the whole to which we are inextricably bound – and how foolish it would be to do so, even if we could. By re-connecting with our environment we can begin to engage with the challenges of the natural world, our way of caring for it, and our way of living in it.

The goal of the DesignWISE tool is to create a workspace in which we can thematize collective responsibility and conscious choice in the Anthropocene age. In keeping with the book's general understanding of design, the tool can be used as a starting point for creative processes not just in the field of professional design, but also in the management of innovation, organizations, and change. It can also be used as a tool for personal growth and as a process model for local communities, private companies and political groups. In each case, the tool aims to foster a broader and more holistic way of thinking, and thus a larger chance of success in the implementation of sustainable changes to organizations and societies. The various elements of the tool are not new in themselves, and its structure is reminiscent of many other models. But the key idea of this tool is to restructure experiences and approaches that are well-known from design and creative work into a more long-term, cyclical and holistic form.

As a method, the tool can be used as both a *map* and a *plan*. The map gives us a bird's-eye-view and an understanding of the whole so that we can see in advance the places or phases where we want to go. The plan helps us to frame the process in time, guiding our progress from an initial creative and brainstorming phase to a phase of concretization and evaluation. One of the key skills in process management is to have both the map and the plan in mind at the same time, that is, both an understanding of the whole and a sense of its sequential phases. In short, the tool encourages a sense of oneness in all our visions and decisions, where there can be no benefit that does not also benefit the whole. But to achieve this sense of oneness, we must be willing to let go of a worldview that is based on separation and disconnection, and embrace the mindset of indigenous thinking, which teaches that, ultimately, all is one.

## Using the DesignWISE tool

When using the DesignWISE tool, it is important to commit to going through all its eight phases to ensure a 360-degree reflection on the topic being considered. Each part of the circle supports and counterbalances the others so that the perspective of the whole is integrated into each part. One can make a single round through the circle, but the cyclical approach invites a repeated exploration in which each round contributes to a more well-considered and informed decision. Each of the phases encourages self-reflection, giving the participant access to a still deeper level of dreams, self-knowledge and connection with the others in the group. The following description is aimed at groups using the DesignWISE tool together, but one can also undertake the process as a personal journey, reflecting on the questions of the model alone.

The DesignWISE circle describes a complete creative process, and in this tool, it is suggested that it starts out

in the northern quadrant. With this sequence, the circle departs from the North American versions of the Medicine Wheel where all beginnings are connected to the eastern quadrant. By suggesting a starting point in North, it is the intention to emphasize a mindset of *letting go* of old habits and thinking styles with the quality of re-setting, before journeying into the new beginning of the Eastern quadrant. I believe that, in view of the current situation, it is more important than ever to start out with an intention of leaving the old behind, before entering a new realm of the possible. The goal is to evoke human history, both as an autobiography and as a planetary-evolutionary cycle of learning and growth. We must place ourselves at the end of one cycle, re-evaluating what has happened so far, in order in order to embrace the potentiality and creativity of the Eastern quadrant.

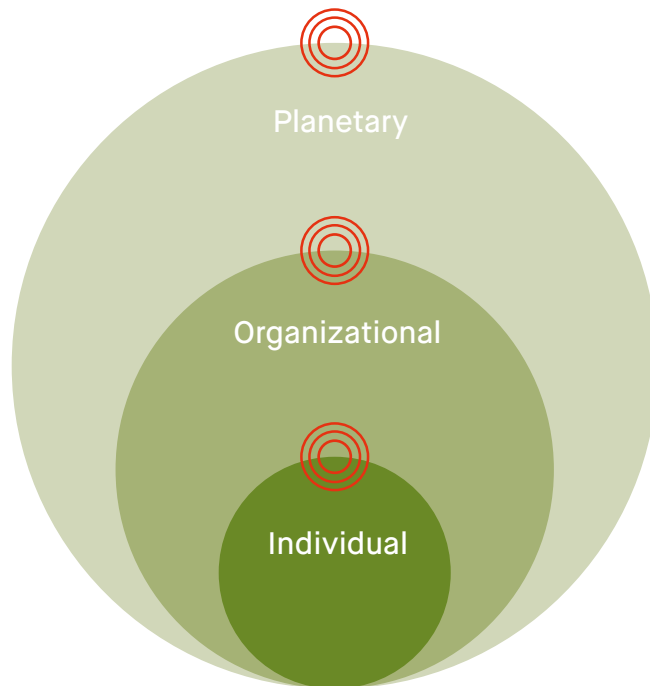
When using the tool to generate ideas, the phases of production and evaluation in the western quadrant will necessarily have to remain speculative: aspirations of what one aims for, and a way of considering future challenges and opportunities. One should therefore return to the circle several times during the project, as the visions begin to be implemented and the aspirations become reality. It is important to feel that one is present with each phase while also continuously acknowledging the perspective of the other phases.

## Facilitation

Begin by preparing a quiet room where the participants will not be disturbed. When preparing the room and the group, it may be useful to review the suggestions for how to set up a creative container in Chapter 5.

The DesignWISE tool, including the wheel itself and the description of its phases below, takes the form of guided process facilitation. The facilitator's role is first to invite the participants to go deeper into their own journey, and

then to structure the phases of the Wheel drawing on the questions proposed in the guide. The facilitator can also elaborate on or adapt the questions to the situation in which the process takes place. Further, the facilitator can decide how long each phase should take, but it is important that there is plenty of time for both individual and shared reflection. It is suggested to set aside 20–25 minutes for each phase, but you can also move on to the next phase when there is a shared sense that the group is ready.



As part of the preparation for the journey, you can choose which primary perspective you will work from, the individual level, the organizational level, for example, a group/team

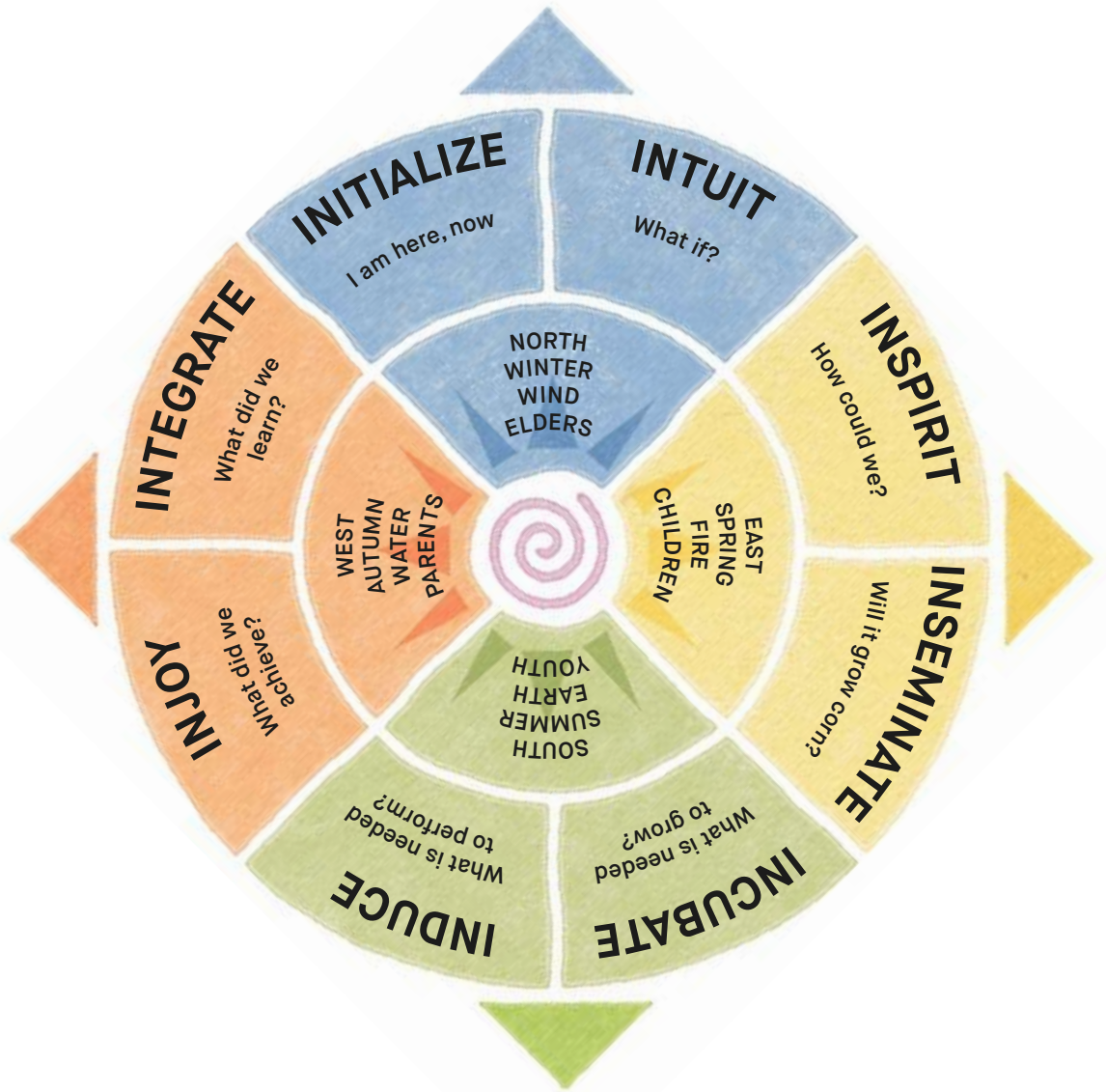
level, or planetary level, knowing that they are connected, and cannot be regarded as completely independent of the others.

Before you begin the journey, select a theme, task, or topic that you would like to focus on. Then choose the perspective you will work from, the personal, organizational, or planetary level.

It is important to be aware that the way you begin the journey affects the outcome. Instead of thinking only in terms of problems and solutions, you should choose a topic that you care about and have hopes, dreams, and visions for. What feels meaningful to focus on to you, the group, the team you work with, the organization you are part of, your local community, your country, your planet?

Write down your thoughts about the chosen topic you would like to focus on. You may share your ideas and visions with the group.

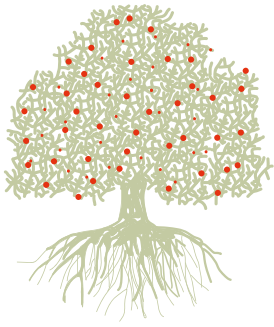
Then the journey into the wheel begins.



The DesignWISE tool invites you to reflect on the interrelations between consciousness and matter, the internal and external aspects of all forms

of design. By exploring this relationship, the hope is that it is possible to achieve a more informed approach to the creation of sustainable design.





## INITIALIZE

*I am here, now*

Initialize means to zero or reset. It is located in the northern quadrant of the circle and is connected with winter. The northern quadrant also represents old age, wisdom, and death.

The Initialize phase of the journey is focused on letting go of the past and accepting the current situation in relation to the chosen topic.

How-to: tune in to your present condition – both the good or bad, beautiful, or ugly sides of it – and accept this as the starting point from which new visions or dreams can emerge.

Write down three or four sentences that describe the situation. It can be things you want to let go of or emerging aspirations or dreams.

Share your insights with the group.



## INTUIT

*What if?*

Intuit means to know, sense, or understand by intuition. It is located in the northeastern quadrant of the circle, corresponding to the end of winter and the threshold of spring.

This Intuit phase is where we step into a new realm of possibilities.

How-to: close your eyes and turn your attention inward. Imagine that you see the sun rising on the horizon – a small sliver of light. Think of it as a new field of possibilities that are to appear.

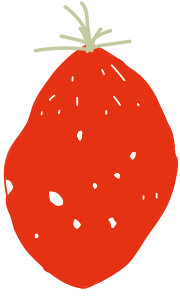
Allow visions and dreams to emerge.

Write down your visions, finding words that describe your dream.

Share your visions with the group.

At this stage, you can choose to pursue the visions individually or as a group. You may explore and develop your aspirations alone, sharing your insights with the group along the way, or you can collectively choose one idea that you will work on together throughout the following phases.





## INSPIRIT

*How could we?*

Inspirit means to encourage or enliven (something or someone). It is located in the eastern quadrant of the circle, symbolizing fire and the sun, as well as rebirth and early childhood. In terms of seasons, this phase marks the beginning of spring and the re-emergence of life.

The Inspirit phase of the journey is focused on the selection of paths you can choose from to get closer to your visions.

How-to: enter into a stream of consciousness where you brainstorm possibilities and initiatives that would lead you closer to the specification of the visions or dreams that emerged in the previous phase.

Write down or draw the ideas.

Consider what your most important visions or ideas are, consider them as dream seeds.

If you work in a group, share your dream seeds with the group. Discuss how you, as a group, can develop a common vision and direction setting from your ideas.

If possible, try to zoom in and out in both time and space



## INSEMINATE

*Will it grow corn?*

Inseminate means to impregnate or to sow. It is located in the south-eastern quadrant of the circle, again symbolizing fire and the sun, but now as the end of spring and the beginning of summer. In terms of age, this phase corresponds to the early teenage years.

The Inseminate phase of the journey aims to mature your own or the groups' dream seeds.

How-to: In this phase, you will choose a path or draw a map by selecting or further envisioning the dream seed from the previous phase, keeping two criteria in mind: the criterion of energy/compassion: which aspect of the dream seed or vision gives you joy, warmth, enthusiasm, and a desire to create? The criterion of logic/wisdom: what is actually going on in the area you are looking at? What is the situation like, what would make the most sense?

Consider the following: what would it take for the dream seed to grow? What would it need in order to thrive and survive? What can the idea contribute in terms of resources, experiences or happiness? How will it benefit the earth and future generations?

Over the next four phases, you will extrapolate the potential of the dream seed and imagine what it would be like to carry it out. You may repeat these phases later, as the project progresses, to reflect on how things actually unfolded.



## INCUBATE

### *What is needed to grow?*

Incubate means to keep something safe and warm so that it can grow. It is located in the southern quadrant of the circle, representing earth and summer, as well as youth and adolescence.

The Incubate phase of the journey aims to make the idea(s) grow. In this phase, the seeds chosen in the Inseminate phase are planted and begin to take form.

How-to: as the journey of clarification begins, consider whether you have what you need to make your idea grow? What can you do to ensure the best possible foundation for your idea, the best precondition for its realization? What stakeholders have to be sworn in and empowered to help? Where should the process begin? What are the first steps?

Write down your reflections and/or share with the group.

## INDUCE

### *What is needed to perform?*

Induce means to give rise to or make something happen. It is located in the south-western quadrant of the circle and corresponds to the late summer, when flowers bloom and the grain, grows.

The Induce phase of the journey is about unfolding the full potential of the idea allowing it to take root, grow and bloom.

How-to: in this phase, it is important to focus on keeping the vision and direction clearly in mind, ensuring that the process has everything it needs to grow and perform.

Consider the following: do you have access to the necessary resources? What obstacles should be cleared from the path? How should the process proceed? How should it be managed? How can the vision be kept alive? How can the goal and direction be kept in sight?



## INJOY

*What did we achieve?*

InJoy means to allow oneself to experience happiness and pleasure by gratefully cherishing what has been gained. InJoy is located in the western quadrant, symbolizing the autumn, the element of water, as well as adulthood and parenthood. The InJoy phase of the journey is about how to be responsible for and celebrate the gained results.

How-to: consider whether you have fully acknowledged your achievements. What were the results of the process? (what goals or results do you expect from the process)?

Write down or draw the achieved (or: expected) results in as much detail as possible, appreciating the outcome.



## INTEGRATE

*What did we learn?*

Integrate means to combine one thing with another to form a whole. It is located in the north-western quadrant, which represents the transition from autumn to winter.

The Integrate phase is about the evaluation of and learning from the process and results.

How-to: in this phase, you will evaluate your journey by telling your story. Who are we now? Who are you now? What have we learned from the process? What have we learned about ourselves? (Or: what do I/we hope to learn from the process?)

How might the future look back on this moment?

Share your insights and visions, eventually draw it or make a mutual collage to visualize it.

Finally, as part of the (future-oriented) story or visualised vision, consider the following: did you achieve what you wanted? Is there any part of the process that you would like to pursue in a new journey? Should you end the journey here or start a new turn, focusing on other or specific issues that arose in the process?

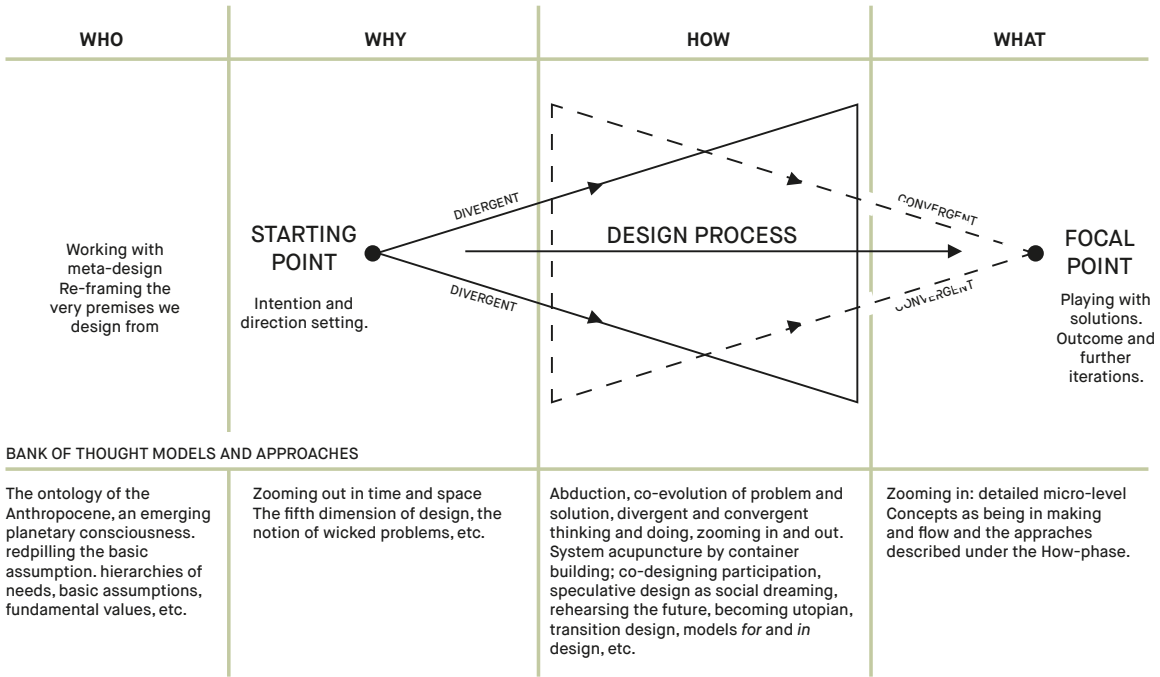
Committing to all parts of the circle presupposes an appreciation of the whole. Focusing on just one part of it can lead to tunnel vision and silo-thinking, and thus a self-reinforcing loop within a single quadrant. For example, if one is fully focused on analyzing and dreaming, staying in the mindset of the northern and north-eastern quadrant, one can end up caught in endless reflections without ever taking action. The consequence of this can be described as a *reflection/ivory tower loop*.

Many innovations and design agencies tend to stay in the Inspirit and Incubate phases, in the eastern and south-eastern quadrants. The mindset of these phases is important for developing new ideas and pushing against existing assumptions, but an over-emphasis on this mindset can also lead to ‘innovation theatre’. This is fun as long as it lasts, but it is not aligned with the real world and the urgency of its crises and does not produce fully fleshed-out ideas or long-term change. This form of innovation also risks being insensitive to those who are made to participate in it as they are left helpless when the ones having fun innovating have gone home. We can call this the *disruption loop*: it is a disruption for the sake of disruption, without a long-term goal or a commitment to the implementation of the ideas that it generates.

The ideas planted in the first four phases begin to find form in the Incubate and Induce phases, in the southern and south-western quadrants. It is here that we act, produce and create. These phases are important because they ensure the actual creation of new ideas, products or strategies, but at the same time, they can easily lead to a *production loop*, in which we produce just to produce. Arguably, the Western world has been caught in the disruption and production loops ever since the Great Acceleration, constantly making and rethinking without reflecting on what can be learned from past experiences, or considering where we want to go and how we

can get there and what the expected outcome is in the longer perspective. These two loops are strengthened by the cultural value that everything new, young and disruptive is good, while all that is connected with continuity, stasis, reflection or thoughtfulness is bad. These values have birthed a whole host of fantastic inventions but at the expense of deeper reflection and learning, leading to widespread stress and burn-out, both within ourselves and in the global ecosystem.

The InJoy and Integrate phases are important for consolidating visions and strategies and for producing and marketing products. From a sustainability perspective, these are also the phases where one can integrate new insights, reflections, lessons and evaluations. These mindsets are important if we are to achieve a more balanced world, where we do not always chase the new but also give ourselves time to consider and learn. But the danger of focusing on evaluation alone is that it can lead to *conformity/resting on laurels loop*, in which one slips back into pride and into business as usual, without listening to what new demands are coming from the customers, the market and not least the planet.



If we compare the suggested generic design process model (e.g., p. 216) with the DesignWISE tool, there are overlaps in terms of mindsets and phases. The *Initializing phase* of the DesignWISE tool has similarities with the Who-column. The suggestion is that in the letting go of the past and tuning in on the present condition of the Initializing phase we might be inspired by the description of the ontology of the Anthropocene in the Introduction or the reflections about the basic assumptions and values that affects our design aspirations of Chapters 3 and 4. They can help us consider: what do we want to get rid of (old values, needs, assumptions, world views), what do I want to keep or further develop? What gives life and for whom? The *Intuit* phase of the DesignWISE tool has overlaps with the Why column. In this phase of imagining and dreaming one might be inspired by the notion of the fifth dimension of design in the Introduction or the zooming in and out frameworks of Chapter 3. Why is this (idea, project, vision) necessary? For whom? The phases of *Inseminating*, *Incubating*, and *Inducing* can be compared with the column of How. In these phases of focusing on how ideas or things can be, one can be informed from the methods and thought models described in Chapters 2, 3, and 5. How can we best pursue our ideas and visions, what is needed to grow corn, what is needed

to perform? The phases of *Indulging* and *Integrating* have overlaps with the column of What. In these phases of delving into what has been achieved and how it is experienced and evaluated, one can be inspired by concepts such as zooming in and out, being in the making, and the ideas about presencing and flow of Chapter 3. What did we achieve? What have we learned? What stories can we tell?

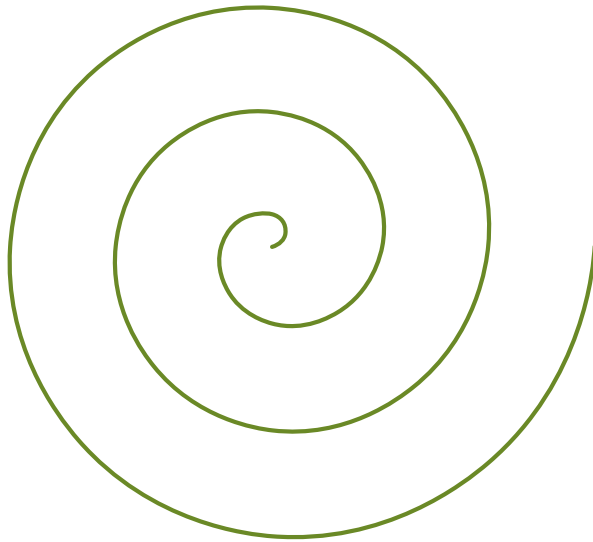
Regardless of the many overlaps with a traditional design process the goal of the DesignWISE tool is to change the normal way of progressing in a design process, where we are typically focused on how we most effectively can move from idea or input to outcome. With the DesignWISE tool the ambition is to suggest a different way of being in the process by incorporating a systemic, that is a holistic, perspective in all the stages of progression. By this the hope is to invite the participants to alternate between stages of doing and being, and thereby learning to connect with the larger planetary whole at the same time as being aware of the deeper values, the very premises we design from – from the letting go of the Initializing phase over the intention setting of the Intuit phase to the outcome evolution of the phase of Integration.

Besides being a tool for organizational transformation, and the development of new products, DesignWISE can also be used as an inspiration for the composition of workgroups, by considering the four main quadrants of the circle and the energy and mindsets associated with each of them. The northern/north-eastern quadrant represents analytical competencies, with a focus on looking both back at what was learned in the past and forward to future visions. The eastern/south-eastern quadrant represents creative and disruptive approaches that challenge existing assumptions and break down the visions of the previous phase into concrete proposals, prototypes, and pitches. The southern/south-western quadrant represents a production-oriented mindset, which is focused on pursuing and refining the idea developed in the previous phases. The northern/north-western quadrant represents a continuity mindset, which recognizes and celebrates past efforts, evaluates what should be learned from them and considers what stories should be told about them, both internally and externally. The crucial thing to keep in mind is that in any process there should be a balance as well as mutual respect between the different qualities since we must go through the entire cycle to arrive at a destination. We can only do so if we honour and respect the qualities and defects in our own position and in that of others: some excel at generating ideas, some at bringing them to life, some at taking a long-term perspective and some at ensuring stability. We must acknowledge and traverse each part of the process, integrating the qualities of every one of them into each step. The eight qualities are equally important and have equal weight, but according to the perspective of this book, it is important to begin in the northern quadrant, grounding oneself in an acceptance of the world as it is, before launching into sky-high dreams. Everything proceeds from that acceptance, including the visions that will grow into intention for a dreamable future.



Nature builds its house every morning and you are one of the walls.<sup>165</sup> The main purpose of this book has been to bring awareness that everything is connected. We can't consider any of our activities independent of the system in which it unfolds. We are deeply entangled. The main question has been to ask, how can we learn to create without causing harm, how can we integrate cyclical ways of thinking, learning, designing, and living in all of our activities? How can we create to regenerate?

As stated in the introduction this book can be read as a 'manifesto for a new faith'. It is rooted in a conviction that if we fundamentally reframe the underlying premises of design, we have the means to create a completely different world. And this is a far more effective way of problem solving than the creation of more artefacts and technical fixes. So let us start by initiating the process, not with a focused idea of a desired outcome, but by bringing awareness to the intentionality behind our creation, the beginning of all imagination.



1  
Graeber (2015: 89).

2  
Laville (2020).

3  
The two approaches to design are presented in Folkmann (2016: 20–22).

4  
Buchanan (2001: 3–23).

5  
Buchanan (1992).

6  
On different positions within design thinking, see also Kimbell (2011); Johansson-Sköldberg et al. (2013); Engholm (2020).

7  
Papanek (1985: 3).

8  
Crutzen and Stoermer (2000); Crutzen (2002).

9  
Steffen et al. (2011: 6).

10  
Lewis and Maslin (2018: 3–5).

11  
Morton (2017).

12  
Purdy (2015, Chapter 1).

13  
Simon (1969: 111).

14  
Simon (1969: 114).

15  
Lamarque (2010: 384).

16  
Shiner (2012: 234).

17  
In my use of the word 'designerly', I draw primarily on Cross (2006) and his definition of characteristics by design cognition, that is for example the tendency of not dwelling very long with the definition of problems, but instead quickly outlining possible contexts and solutions, proceeding in a rather ad hoc-like unsystematic way, short-cutting over-structured approaches or unorthodox combinations of knowledge fields or sources of inspiration.

18  
See, e.g., Sanders and Stappers (2014).

19  
Quoted from Buckminster Fuller's drawing, accessed through the Virginia Tech Special Collection and University Archives on Buckminster Fuller, available at: <https://vtspecialcollections.wordpress.com/2018/04/20/r-buckminster-fuller/>. Accessed 19 July 2022.

20  
Papanek (1985: 4).

21  
The World Commission on Environment and Development (WCED) report Our Common Future (1987). The report also came to be known as the Brundtland Report after the chairwoman, Gro Harlem Brundtland.

22  
Orr (2002: 4).

23  
Steffen et al. (2011: 846).

24  
Steffen et al. (2011: 846), quoting Pyne (1997).

25  
Steffen et al. (2011: 846), quoting Tobias (1976: 1032).

26  
Harari (2011: 13).

- 27  
Harari (2013: 37), quoting Pelegrin (1993: 310).
- 28  
Ingold (2013: 35).
- 29  
Ingold (2013: 36–37).
- 30  
Wahl and Baxtor (2008: 72).
- 31  
Wahl and Baxtor (2008: 73).
- 32  
In their article, Wahl and Baxtor are primarily focused on the capacity of professional designers to facilitate sustainable solutions, thereby acting as interdisciplinary integrators of multiple perspectives and the diverse knowledge bases of various disciplines and value systems. I agree that this is an ideal role for professional designers; but in this book, my focus is not primarily on professional designers, but on how the methods and tools that have been developed in the field of design and adjacent disciplines can be used to encourage a more widespread participation in the creation of local, regional and global visions of sustainability, and not least in the development of strategies to engage humanity collectively in cooperative processes that can turn those visions into reality.
- 33  
Cf. Wilber (2001: 6), quoted in Wahl and Baxtor (2008: 77).
- 34  
Csikszentmihalyi (1993), quoted in Wahl and Baxtor (2008: 77).
- 35  
In Graves's paper from 1947, entitled 'Human nature prepares for a momentous leap', he argues that humanity stands at the beginning of 'not merely a transition to a new level of existence, but the start of a new movement in the symphony of human history' (quoted in Beck and Cowan 1996: 319).
- 36  
Beck and Cowan (1996: 29), quoted in Wahl and Baxtor (2008: 79).
- 37  
Beck and Cowan, (1996: 29), quoted in Wahl and Baxtor (2008: 79).
- 38  
Beck and Cowan, quoted in Wahl and Baxtor (2008: 78).
- 39  
Wahl and Baxtor (2008: 80).
- 40  
Beck and Cowan (1996: 107), quoted in Wahl and Baxtor (2008: 82).
- 41  
The table is based on Wahl and Baxter (2008: 80–82), including further points about the various archetypes and periods from Laloux (2014: 13–43). Note that the model presented in Wahl and Baxter is a consolidation of the work of Graves, Beck and Cowan, and Wilber.  
Mode of thought: in Wahl and Baxter (2008: 80–82). In the column Occurrence and influence, the estimated percentages are taken from Wilber, while further remarks on contemporary occurrence are primarily based on Laloux. References to the child psychologist Jean Piaget in the right-hand column are taken from Laloux (2014: 16).
- 42  
Laloux (2014: 17).
- 43  
Laloux (2014: 18).
- 44  
Laloux (2014: 18).
- 45  
Laloux (2014: 18).
- 46  
Cai and Yates (2020: 151).
- 47  
Laloux (2014: 24).
- 48  
Laloux (2014: 30).
- 49  
Orr (2002: 4).
- 50  
The WHO fact sheets available at <https://www.who.int/news-room/fact-sheets/detail/depression>. Accessed 1 July 2022.
- 51  
See the report by Oxfam International. Available at: <https://www.oxfam.org/en/press-releases/just-8-men-own-same-wealth-half-world>. Accessed 19 June 2022.
- 52  
See the report by Oxfam International. Available at: <https://www.oxfam.org/en/press-releases/mega-rich-recoup-covid-losses-record-time-yet-billions-will-live-poverty-least>. Accessed 19 June 2022.
- 53  
Steffen et al. (2015: 38).
- 54  
Model adapted from Steffen et al. (2015).
- 55  
Max Rosen: Economic Growth. Our World in Data at: <https://ourworldindata.org/economic-growth>. Accessed 19 July 2022.
- 56  
Model adapted from Laloux (2014: 35).
- 57  
Aicher (1991: 182).
- 58  
Manzini (1991).
- 59  
For example, Delanda (1992: 129–67) argues that geological formations can be seen as a kind of life. One of the most important figures in the attempt to include non-human actors in scientific thinking and social science theory is without any doubt Bruno Latour (e.g. 2015, 2017, 2018). See also relational ecology (Martin 2019) and Coccia (2016).
- 60  
Fry (2010).
- 61  
Boeri. Stefano Boeri Architetti about Liuzhou Forest City: <https://www.stefano-boeri-architetti.net/en/project/liuzhou-forest-city/>. Accessed 19 July 2022.
- 62  
Morton (2013: 1).
- 63  
Morton (2013: 16–17).
- 64  
Rittel and Webber (1972).
- 65  
Rittel and Webber (1973: 166–69).
- 66  
Buchanan (1992: 16).
- 67  
The report was published as part of the company Humantific & NextDesign Leadership Network's series on new trends in the design scene.
- 68  
Model adapted from vanPatter (2020: 26–27).
- 69  
Model adapted from vanPatter (2020: 38).
- 70  
Morton (2010: 16–17).
- 71  
The concept of co-evolution was first introduced by Maher (1994); and later developed by Dorst and Cross (2001). The term 'creative engine' was coined by Dorst (2004: 2); see also Christensen and Ball (2016).
- 72  
Bordal (2018b: 115).
- 73  
Dorst (2015: 25).

- 74  
The model is adapted from Bordal (2018b: 115).
- 75  
Dorst (2015: 12).
- 76  
Bordal (2015: 291). Model adopted from Bordal, same page.
- 77  
Schön (1983).
- 78  
Chew (2020).
- 79  
The term 'abduction' was first introduced in Pierce's work on the logic of science, published as a series of articles in the *Popular Science Monthly* between 1877 and 1878.
- 80  
Kolko (2010).
- 81  
Kolko (2010: n.pag.).
- 82  
Jones (1970), edition 1992.
- 83  
Cross (1984) and Engholm (2017).
- 84  
Lawson (2005: 49).
- 85  
Lawson (2005: 49).
- 86  
See e.g. Bauer and Eagan (2008), Carlgreen et al. (2016), Hassi and Laakso (2011) and Goldschmidt (2014).
- 87  
The Double Diamond model was launched in 2004; further information can be found at the Design Council's website: <https://www.designcouncil.org.uk/news-opinion/what-framework-innovation-design-councils-evolved-double-diamond>. Accessed 19 July 2022.
- 88  
On iteration as a core principle in design, see Bauer and Eagan (2008), Carlgreen et al. (2016) and Kimbell (2011).
- 89  
British Council (2021: 47).
- 90  
British Council (2021: 48).
- 91  
British Council (2021).
- 92  
British Council (2021).
- 93  
British Council (2021: 49).
- 94  
British Council (2021).
- 95  
British Council (2021).
- 96  
Ramirez (2019: 74).
- 97  
Dorst (2015); see also Kokotovich and Dorst (2016).
- 98  
Dorst (2015: 25).
- 99  
See the report by the WWF. Available at: <https://globalnews.ca/news/4610304/human-species-wildlife-extinction-wwf/>. Accessed 19 June 2022.
- 100  
This example is taken from Richardson (2019: 9-10).
- 101  
The description of the Three Horizon Framework build on Wahl (2016: 53) with reference to Sharpe (2013).
- 102  
Wahl (2016: 53)
- 103  
Sharpe (2013: 2).
- 104  
For example, Senge et al. (2006).
- 105  
Scharmer, quoted in Senge et al. (2006: 5).
- 106  
Droste (2002: 24-32).
- 107  
Morton (2017: 6).
- 108  
Morton (2017, Årstal: 8).
- 109  
Hutchins and Storm (2019: 19-20).
- 110  
Latour (2004).
- 111  
See Corazon et. al. (2010); see also the following report in Science Daily: <https://www sciencedaily.com/releases/2010/07/100723161221.htm>. Accessed 19 July 2022.
- 112  
Haraway (2016).
- 113  
Csikszentmihalyi (1990/2008).
- 114  
Quoted from Balch (2013, unpagged).
- 115  
Maslow (1966).
- 116  
Maslow (1971: 269).
- 117  
Scharmer (2007).
- 118  
Orr (2002: 28).
- 119  
Orr (2002: 32).
- 120  
Eno (2008).
- 121  
Meadows (2008: 17).
- 122  
Meadows (2008: 188).
- 123  
Senge (2006: 34-35).
- 124  
Taylor (2021: n.pag.)
- 125  
Schein (2017: 25-27).
- 126  
Taylor, quoted in Hildebrandt (2011: 16).
- 127  
Beck (1986).
- 128  
Meillassoux and Badiou (2008: 7).
- 129  
Senge (2006: 34-35).
- 130  
IDOART is a Danish concept developed, published in e.g. Lausten and Hoier (2011).
- 131  
The description of the simultaneity principle is based on Whitney and Trosten-Bloom (2003: 38-39).
- 132  
Knapp et al. (2016: 35).
- 133  
As quoted in Chapter 1.
- 134  
Sanders and Stappers (2008).
- 135  
Sanders and Stappers (2008).
- 136  
Pralhalad and Ramaswamy (2004).
- 137  
Meroni (2007).
- 138  
Manzini (2015: 65).

- 139  
Find out more about the Not Impossible projects at their website: <https://www.notimpossible.com/projects>. Accessed 19 July 2022.
- 140  
Dunne and Raby (2001, 2013). See also Fry (2018) and Kolko (2012).
- 141  
Sanders and Stappers (2014).
- 142  
Model adapted from Dunne & Raby (2013: 5). Dunne & Raby further refer to Stuart Candy who has made the diagram, based on Joseph Voros, 'A primer on futures studies foresight and the use of scenarios', *Prospect, the Foresight Bulletin*, 6 (December 2001), available at <https://www.downloadmaghaleh.com/wp-content/uploads/edd/maghaleh/1398/13260.pdf> Accessed 28 January 2022.
- 143  
Halse et al. (2010).
- 144  
Hillgren et al. (2011).
- 145  
Manzini (2015). Model based on different illustrations of Manzini's concept of 'diffuse design' (performed by everybody) and expert design (performed by those who have been trained as designers) and how they interact.
- 146  
Klein (2020).
- 147  
Hamilton (2017: n.pag.).
- 148  
Halvorson (2018: n.pag.).
- 149  
Irwin (2015).
- 150  
See e.g. Hopkins (2008, 2020).
- 151  
Terry et al. (2013).
- 152  
Haasnot, quoted in Schuttenhelm (2019).
- 153  
Schuttenhelm (2019).
- 154  
Solnit (2004: 7).
- 155  
See e.g., Ceschin and Gaziulusoy (2016: 124-125).
- 156  
Quoted from the website of The Desmond Tutu Peace Foundation. Available at: <http://www.tutufoundationusa.org/2015/10/07/10-pieces-of-wisdom-from-desmond-tutu-on-his-birthday/>. Accessed 19 July 2022.
- 157  
Black Elk Speaks is a 1932 book by John G. Neihardt, and American poet and writer, who related the story of Black Elk, and Oglala Lakota medicine man.
- 158  
Achtner et al. (1998).
- 159  
Fuchs (2018: 47).
- 160  
See Greysshield and Castillo (2020); as well as the knowledge-sharing platform IWOK Now. Available at <https://www.iwokresearch.org>. Accessed 19 July 2022.
- 161  
Watson (2019: 26).
- 162  
Eliade (1987: 137).
- 163  
Over the past years, there has been a growing interest in using the Medicine Wheel to promote positive change in the context of education (see, e.g., McCarthy et al. 2011; Kemppainen et al. 2008); as well as in group sessions with adults (see, e.g., Garner et al. 2011).
- 164  
Lüttichau (2017: 242).
- 165  
Line from poem by Merete Pryds Helle written for a videoinstallation at Designmuseum Danmark in connection with the exhibition Future is Present. The poem is inspired by this book and the title of the video installation is Create to Regenerate.

## INTRODUCTION

Page 18  
Five Orders of Design. Concept by Ida Engholm/Illustration by NR2154.

Page 19  
Design is. Concept by Ida Engholm/Illustration by NR2154.

Page 19  
Design Thinking. Concept by Ida Engholm/Illustration by NR2154.

Page 26  
The Anthropocene. Concept by Ida Engholm/Illustration by Agnes Engholm.

Page 28  
Spiral. Illustration by Ida Engholm/NR2154.

Page 32  
Being and doing. Concept by Ida Engholm/Illustration by Agnes Engholm.

Page 38  
Buckminster Fuller drawing. Printed with permission (The Estate of R. Buckminster Fuller).

## CHAPTER 1

Page 68-69  
The Great Acceleration. Printed with permission from Will Steffens.

Page 70  
BNP growth, adopted from: <https://ourworldindata.org/economic-growth> Printed with permission (Creative Commons).

Page 71  
Graph with developmental paradigms. Adapted from Laloux (2015: 35) Printed with permission from Frederick LaLoux.

## CHAPTER 2

Page 79  
Liuzhou Forest City. Printed with permission from Stefano Boeri Architetti.

Page 79  
New York Upper West side. Printed with permission from Henry Do.

Page 84  
Model adapted from GK VanPatter (2020: 26-27). Printed with permission from GK. VanPatter.

Page 87  
Three types of problem-solving processes. Adopted from GK VanPatter (2020: 38). (Do).

Page 91  
Decision tree. Adopted from Sidsel Bordal (2020: 15) with the authors permission.

Page 93  
Wicked problems. Concept by Ida Engholm/Illustration by Agnes Engholm.

Page 95  
Problem/solution. Concept by Ida Engholm/Illustration by Agnes Engholm.

Page 96  
Woods and mountain. Illustration by Agnes Engholm.

Page 97  
Leap of Faith. Illustration by Agnes Engholm.

Page 97  
Model adapted from Bordal (2020: 15) with the authors permission.

Page 99  
Model adapted from Kolko (2010: unpagged) Printed with permission from Jon Kolko.

Page 101  
Own graphic adoption.

Page 103  
Lawson Block model, adapted from Lawson (2006: 49). Printed with permission from Bryan Lawson.

## CHAPTER 4

Page 104  
Illustration of Schön's concept of naming and framing. Illustration by Ida Engholm/ Agnes Engholm.

Page 105  
British Design Council: Double Diamond. Printed with permission from British Design Council.

Page 108  
British Design Council: Beyond Net Zero. Do.

Page 111  
Extracted/generic design process model by Ida Engholm/Illustration by NR2154.

## CHAPTER 3

Page 122  
The challenge of Wicked problems. Illustration by Ida Engholm/NR2154.

Page 123  
The elephant. Illustration by Agnes Engholm.

Page 126  
Horizontal and vertical zooming. Illustration by Ida Engholm/NR2154.

Page 128  
Three Horizon Framework. Wahl (2016: 53ff) with reference to Sharpe (2013). Printed with permission from Daniel C. Wahl.

Page 130  
As Above, so below. Illustration by Agnes Engholm.

Page 131  
Doing and Being. Illustration by Ida Engholm/Henriette Melchiorson/NR2154.

Page 134  
Inner silence. Illustration by Ida Engholm/NR2154.

Page 136  
Forrest bathing. Illustration by Agnes Engholm.

Page 139  
Planetary macro-level and de-focused being. Illustration by Ida Engholm/NR2154.

Page 141  
Zoom in and out model with loops. Illustration by Ida Engholm/NR2154.

Page 142  
Zoom in and out exemplified through three arenas. Illustration by Ida Engholm/NR2154.

Page 145  
Extracted/generic design process model with zoom in and out. Illustration by Ida Engholm/NR2154.

Page 154  
Maslow Pyramid, graphic adoption by NR2154.

Page 154  
Revised pyramid, graphic adoption by NR2154.

Page 156  
Proposed revised version of pyramid. Illustration by Ida Engholm/Nils Vinding/NR2154.

Page 159  
Proposed revised version of pyramid turned on its head. Illustration by Ida Engholm/Nils Vinding/NR2154.

## CHAPTER 5

Page 177  
Lilypond. Adoption from Ida Engholm of Edgard Schein's description of the Lilypond metaphor.

Page 179  
Systems within systems. NR2154.

Page 180  
Extracted/generic design process model with basic assumptions. Illustration by Ida Engholm/NR2154.

Page 183  
System acupuncture. Illustration by Ida Engholm/NR2154.

Page 186  
The simultaneity principle. Illustration by Agnes Engholm.

Page 187  
Dare to disrupt. Illustration by Agnes Engholm.

Page 188  
Sufficient disruption. Concept by Ida Engholm/Illustration by Agnes Engholm.

Page 189  
How do we share? Illustration by Agnes Engholm.

Page 191  
Co-designing. Illustration by Agnes Engholm.

Page 194  
Co-design and diffuse design, graphic interpretation by Ida Engholm based on text from Manzini (2015). Illustration by NR2154.

Page 195  
'Let's change the world together'. <https://www.notimpossible.com/projects>.

Page 197  
Take a trip forward in time. Illustration by Ida Engholm/NR2154.

Page 199  
Preferable futures. Model adopted with permission from Dunne, Raby and Candy.

Page 200  
Social dreaming. Illustration by Agnes Engholm.

Page 202  
The Hitachi Kyoto University Laboratory project 'Toward Enabling Ever More People to Live Happily in 2050. Drawing adopted with permission from Hitachi Kyoto University.

Page 206  
License to dream. Illustration by Agnes Engholm.

Page 209  
Ørsted case. Illustrations printed by permission by Ørsted.

Page 211  
DDC case. Illustrations printed by permission by Danish Design Centre (DDC).

Page 215  
Waterplan by Floria Boer and Marco Vermeulen, De Urbanisten. Printed with permission from De Urbanisten.

Page 216  
Extracted/generic design process model with Who, Why, How and What. Illustration by Ida Engholm/NR2154.

## CHAPTER 6

Page 230  
Regeneration circle. Illustration by Agnes Engholm.

Page 235  
The Medicine Wheel. Own adaption from different versions of the North American medicine wheel. Illustration by NR2154.

Page 236  
Night photo of Madsebakke wheel cross at Bornholm. Photo by Outi Kuma, printed with permission.

Page 241  
Level of journey, the individual, organizational or global level. Model by Ida Engholm/illustration by NR2154.

Page 243  
The DesignWISE circle. Concept by Ida Engholm and Nils Vinding. Illustration by NR2154. Vignettes by Agnes Engholm.

Page 250  
Extracted/generic design process model combined with the DesignWISE tool. Illustration by Ida Engholm/NR2154.

- Achtner, Wolfgang, Kunz, Stefan, and Walter, Thomas (1998), *Dimensionen der Zeit: Die Zeitstrukturen Gottes, der Welt und des Menschen*, WBG-Bibliothek, Darmstadt: Wissenschaftliche Buchgesellschaft.
- Aicher, Otl (1991), *Die Welt als Entwurf*, Hoboken: Wiley.
- Alexander, Christopher (1964), *Notes on the Synthesis of Form*, Cambridge: Harvard University Press.
- Althusser, Louis (2001), 'Ideology and ideological state apparatuses: Notes towards an investigation', in *Lenin and Philosophy and Other Essays*, New York: Monthly Review Press, pp. 85–126.
- Andersen, Casper, Kratschmer, Alexandra R., Clasen, Mathias, and Nielsen, Trine Kellberg (2019), 'Mennesket i biokulturelt perspektiv', in T. K. Nielsen, C. Andersen, A. R. Kratschmer and M. Clasen (eds), *Menneske, kultur, evolution – et biokulturelt perspektiv*, Aarhus: Aarhus University Press, pp. 11–31.
- Archer, Bruce (1965). *Systematic Method for Designers*, London: Council of Industrial Design.
- Armstrong, Rachel (2014), 'Space to think', *Architectural Review*, 1406, pp. 30–31.
- Asher, Frederick (1997), *Richard Warren Sears: Icon of Inspiration*, New York: Vantage Press.
- Assmann, Jan (2006), *Religion and Cultural Memory: Ten Studies* (trans. R. Livingstone), Stanford: Stanford University Press.
- Baudrillard, Jean (1970), *The Consumer Society: Myths and Structures*, New York: Sage Publications.
- Bauer, Robert and Eagen, Ward (2008), 'Design thinking: Epistemic plurality in management and organization', *Aesthesis: International Journal of Art and Aesthetics in Management and Organizational Life*, 2:3, pp. 568–96.
- Beck, Ulrik (1986), *Risk Society: Towards a New Modernity*, London: Sage.
- Beck, Don Edward and Cowan, Christopher (1996), *Spiral Dynamics: Mastering Values, Leadership, and Change*, Cambridge: Blackwell.
- Bennett, Jane (2017), 'Vegetal life and onto-sympathy', in C. Keller and M.-J. Rubenstein (eds), *Entangled Worlds: Religion, Science, and New Materialisms*, New York: Fordham University Press.
- Bennis, Warren G. and Nanus, Burt (1985), *Leaders: The Strategies for Taking Charge*, New York: Harper.
- Berger, André and Loutre, Marie-France (2002), 'An exceptionally long interglacial ahead?', *Science*, 297, pp. 1287–88. Accessed 1 January 2022.
- Boccia, Maddalena, Piccardi, Laura and Guariglia, Paola (2015), 'The meditative mind: A comprehensive meta-analysis of MRI studies', *BioMed Research International*, Article ID 983086. <https://doi.org/10.1155/2015/419808>. Accessed 11 June 2022.
- Bordal, Sidse (2018a), 'Into the Unknown'. January 25. 2018. Available at: <https://explorativeinnovation.wordpress.com>. Accessed 11 June 2022.
- Bordal, Sidse (2018b), 'Unfuzzing design: How progress is made towards unknown goals', Ph.D. thesis, Denmark: Design School Kolding.
- Bragdon, Joseph H. (2006), *Profit for Life: How Capitalism Excels: Case Studies in Living Asset Management*, Cambridge: Society for Organizational Learning.
- Bragdon, Joseph H. (2016), *Companies That Mimic Life: Leaders of the Emerging Corporate Renaissance*, London: Routledge.
- Brandt, Eva and Binder, Thomas (2016), 'Med det sociale som designmateriale', in L. Dybdahl (ed.), *Dansk Design Nu*, Copenhagen: Strandberg Publishing, pp. 354–61.
- Brimblecombe, Peter (1987), *The Big Smoke: A History of Air Pollution in London Since Medieval Times*, London: Methuen.



- British Council (2021), *Beyond Net Zero: A Systemic Design Approach*. Published April 2021. <https://www.designcouncil.org.uk/our-work/skills-learning/tools-frameworks/beyond-net-zero-a-systemic-design-approach/> Accessed 11 June 2022.
- Broecker, Wallace S. and Stocker, Thomas F. (2006), 'The holocene CO2 rise: Anthropogenic or natural?', *Eos*, 87:3, pp. 27–29.
- Buchanan, Richard (1992), 'Wicked problems in design thinking', *Design Issues*, 8:2, pp. 5–21.
- Buchanan, Richard (1995), 'Rhetoric, humanism, and design', in R. Buchanan and V. Margolin (eds), *Discovering Design: Explorations in Design Studies*, Chicago: University of Chicago Press, pp. 23–66.
- Buchanan, Richard (2001), 'Design research and the new learning', *Design Issues*, 17:4, pp. 3–23.
- Burcharth, Martin (2020), 'Klimafilosof: Forst når vi erkender, at naturen har en bevidsthed, kan vi imødekomme klimakrisen', *Information*, January 18, 2020, sec. Moderne Tider. Available at: <https://www.information.dk/moti/2020/01/klimafilosof-foerst-naar-erkender-naturen-bevidsthed-kan-imoedegaa-klimakrisen>. Accessed 11 June 2022.
- Cai, Linda Jingfang and Yates, Chris (2020), *Share: How Organizations Can Thrive in an Age of Networked Knowledge, Power and Relationships*, London: Bloomsbury.
- Carlgren, Lisa, Rauth, Ingo, and Elmquist, Maria (2016), 'Framing design thinking: The concept in idea and enactment', *Creativity and Innovation Management*, 25:1, pp. 38–57.
- Carrington, Damian (2018), 'Humanity has wiped out 60% of animal populations since 1970, report finds', *The Guardian*, 30 October 2018, sec. The Age of Extinction. Available at: <https://www.theguardian.com/environment/2018/oct/30/humanity-wiped-out-animals-since-1970-major-report-finds>. Accessed 11 June 2022.
- Carson, Anne (2010), *Nox*, New York: New Directions.
- Ceschin, Fabrizio and Gaziulusoy, Idil (2016), 'Evolution of design for sustainability: From product design to design for system innovations and transitions', *Design Studies*, 47, pp. 118–63.
- Chew, A. W. (2020), 'Informed guessing: Enacting abductively-driven research', *International Journal of Research & Method in Education*, 43:2, pp. 189–200.
- Chakrabarti, Amaresh and Blessing, Lucienne T. M. (eds) (2014), *An Anthology of Theories and Models of Design: Philosophy, Approaches and Empirical Explorations*, London: Springer.
- Chan, Chiu-Shui (2015), 'Style and creativity in design', in *Studies in Applied Philosophy, Epistemology and Rational Ethics*, vol. 17, London: Springer.
- Christensen, Bo Karl (2017), 'Sådan kickstartede de græske filosoffer videnskaben.' Videnskab.dk, 6 March. Available at: <https://videnskab.dk/naturvidenskab/saadan-kickstartede-de-graeske-filosoffer-videnskaben>. Accessed 11 June 2022.
- Christensen, Bo T. and Ball, Linden J. (2016), 'Creative analogy use in a heterogeneous design team: The pervasive role of background domain knowledge', *Design Studies*, 46, pp. 38–58.
- Coccia, Emanuele (2018), *Life of Plants. A Metaphysics of Mixture*, Oxford: Polity Press.
- Conner, Daryl R. (1993), *Managing at the Speed of Change: How Resilient Managers Succeed and Prosper Where Others Fail*, New York: Random House.
- Cooperrider, David and Goodwin, Lindsey N. (2012), 'Positive organization development: innovation-inspired change in an economy and ecology of strengths', Research gate. DOI: 10.1093/oxford-hb/9780199734610.013.0056. Accessed 11 June 2022.
- Cooperrider, David, Stavros, Jacqueline M., and Whitney, Diana (2008), *Appreciative Inquiry Handbook: For Leaders of Change*, Oakland: Berrett-Koehler Publishers.
- Corazon, Sus Sola, Stigsdotter, Ulrika K., Jensen, Claudi, Grete, Anne, and Nilsson, Kjell (2010), 'Development of the nature-based therapy concept for patients with stress-related illness at the Danish Healing Forest Garden Nacadia', *Journal of Therapeutic Horticulture*, 20, pp. 34–51.
- Cross, Nigel (ed.) (1984), *Developments in Design Methodology*, Hoboken: Wiley.
- Cross, Nigel (ed.) (2006), *Designerly Ways of Knowing*, London: Springer.
- Crutzen, Paul J. (2002), 'Geology of mankind', *Nature*, 415, p. 23.
- Crutzen, Paul J. and Stoermer, Eugene F. (2000), 'The "Anthropocene"', *Global Change Newsletter*, 41, pp. 17–18.
- Csikszentmihalyi, Mihaly (1993), *The Evolving Self: A Psychology for the Third Millennium*, New York: Harper Collins.
- Csikszentmihalyi, Mihaly (1997), *Finding Flow: The Psychology of Engagement with Everyday Life*, New York: Basic Books.
- Csikszentmihalyi, Mihaly (2008), *Flow: The Psychology of Optimal Experience*, New York: Harper Collins.
- Delanda, Manuel (1992), 'Nonorganic life', in S. Kwinter and J. Cray (eds), *Incorporations*, ZONE 6, New York: Zone Books, pp. 128–67.
- Descartes, René (1637), *A Discourse on the Method of Correctly Conducting One's Reason and Seeking Truth in the Sciences*, Oxford: Oxford University Press.
- Design af Relationer (2014), *Et samarbejde om at designe relationer til nogle af velfærdssamfundets mest handicappede*, Denmark: Design School Kolding, [https://issuu.com/designskolen\\_kolding/docs/rapport-ipaper\\_enkeltside\\_](https://issuu.com/designskolen_kolding/docs/rapport-ipaper_enkeltside_). Accessed 11 June 2022.
- Dorst, Kees (2004), 'On the problem of design problems – Problem solving and design expertise', *Journal of Design Research*, 4:2, pp. 185–96.
- Dorst, Kees (2005), *Frame Innovation: Create New Thinking by Design*, Cambridge: MIT Press.
- Dorst, Kees (2015), *Frame Innovation: Create New Thinking by Design*, Cambridge: MIT Press.
- Dorst, Kees and Cross, Nigel (2001), 'Creativity in the design process: Co-evolution of problem-solving', *Design Studies*, 22:5, pp. 425–37.
- Droste, Magdalena (2006), *Bauhaus*, Cologne: Taschen.
- Drotner, Kirsten (1990), *At skabe sig – selv: Ungdom, æstetik, pædagogik*, Copenhagen: Gyldendal.
- Dunne, Anthony (1999), *Hertzian Tales: Electronic Products, Aesthetic Experience, and Critical Design*, Cambridge: MIT Press.
- Dunne, Anthony and Raby, Fiona (2001), 'Design Noir: The Secret Life of Electronic Objects' Basell: Birkhäuser. Available at: <https://www.theguardian.com/environment/2018/oct/30/humanity-wiped-out-animals-since-1970-major-report-finds>. Accessed June 19 2022.
- Dunne, Anthony and Raby, Fiona (2013), *Speculative Everything: Design, Fiction, and Social Dreaming*, Cambridge: MIT Press.
- Dunning, John (1998), *On the Air: The Encyclopedia of Old-Time Radio*, Oxford: Oxford University Press.

- Einstein, Albert (1931), *Mein Weltbild* ('The World As I See it') (trans. Alan Harris), San Diego: Book Tree.
- Eliade, Mircea (1987), *The Sacred and the Profane: The Nature of Religion* (trans. W.R. Trask), New York: Harcourt.
- Engholm, Ida (2011), 'Positions in contemporary design research', *Design Research Journal*, 2:11, pp. 48–63.
- Engholm, Ida (2017), 'Reflecting contemporary design research', *Form Akademisk*, 10:3, pp. 1–15.
- Engholm, Ida and Michelsen, Anders (1999), *Designmaskinen: Design af den Moderne Verden*, Copenhagen: Gyldendal.
- Eno. Bryan (2008), The Big Here and Long Now. <https://longnow.org/essays/big-here-long-now/>. Accessed 11 June 2022.
- EPICA Community Members (2004), 'Eight glacial cycles from an Antarctic ice core', *Nature*, 429, pp. 623–28.
- Espino, Cinthia (2020), 'Plants die, but what happens to the plastic pots?', Noteworthy – The Journal Blog, 12 June. <https://blog.usejournal.com/plants-die-but-what-happens-to-the-plastic-pots-7f9e5d47b2e>. Accessed 11 June 2022.
- Fallan, Kjetil (ed.) (2019), *The Culture of Nature in the History of Design*, London: Routledge.
- Favaro, Ken (2014), 'Strategy or culture: Which is more important?', *Strategy and Business Blog* 22, <https://www.strategy-business.com/blog/Strategy-or-Culture-Which-Is-More-Important?gko=26c64>. Accessed 11 June 2022.
- Fjordbak, Jan (2015), *Den innovative medarbejder*, Copenhagen: Kommune-forlaget.
- Folkmann, Mads N. (2016), *Designkultur: Teoretiske perspektiver på design*, Frederiksberg: Samfundslitteratur.
- French, Daniel (2017), *When They Hid the Fire: A History of Electricity and Invisible Energy in America*, Pittsburgh: University of Pittsburgh Press.
- Fry, Tony (2010), *Design as Politics*, London: Bloomsbury.
- Fry, Tony (2018), *Design Futuring: Sustainability, Ethics and New Practice*, London: Bloomsbury.
- Fuchs, Thomas (2018), 'The cyclical time of the body and its relation to linear time', *Journal of Consciousness Studies*, 25:7&8, pp. 47–65.
- Fuller, R. Buckminster (1961), 'The architect as world planner: Congress of the International Union of Architects', London. Available at: <https://arch629el-dridge.files.wordpress.com/2010/04/wk13-bucky-architect-as-world-planner.pdf>. Accessed 11 June 2022.
- Garbuio, Massimo, Lovallo, Dan, Porac, Joseph, and Dong, Andy (2015), 'A design cognition perspective on strategic option generation', *Advances in Strategic Management*, 32:1, pp. 437–65.
- Garbuio, Massimo, Dong, Andy, Nidhida, Lin, Tschang, Ted, and Lovallo, Dan (2018), 'Demystifying the genius of entrepreneurship: How design cognition can help create the next generation of entrepreneurs', *Academy of Management Learning and Education*, 17:1, pp. 41–61.
- Garner, Holly, Bruce, Mary Alice, and Stellern, John (2011), 'The Goal Wheel: Adapting Navajo Philosophy and the Medicine Wheel to work with adolescents', *The Journal for Specialists in Group Work*, 36:1, <https://doi.org/10.1080/01933922.2010.537735>. Accessed 11 June 2022.
- Giedion, Siegfried (1948), *Mechanization Takes Command*, Oxford: Oxford University Press.
- Goldschmidt, Gabriella (2014), *Linkography: Unfolding the Design Process*, Cambridge: MIT Press.
- Goodman, Nelson (1978), *Ways of World-making*, Indianapolis: Hackett Publishing.
- Graeber, David (2015), *The Utopia of Rules: On Technology, Stupidity, and the Secret Joys of Bureaucracy*, Brooklyn: Melville House.
- Greynshield, Lisa and Castillo, Ramon Del (2020), *Indigenous ways of Knowing in Counseling. Theory, Research, and Practice*, Switzerland: Springer.
- Gropius, Walter (1919), 'Bauhaus manifesto', <https://bauhausmanifesto.com>. Accessed 11 June 2022.
- Halse, Joachim, Brandt, Eva, Clark, Brendon, and Binder, Thomas (eds) (2010), *Rehearsing the Future*, Copenhagen: Danish Design School Press.
- Hamel, Gary (2010), *The Future of Management*, Brighton: Harvard Business Review Press.
- Harari, Yuval Noah (2015), *Sapiens: A Brief History of Humankind*, London: Harwill Secker.
- Haraway, Dona (2016), *Staying with the Trouble: Making Kin in the Chthulucene*, Durham: Duke University Press.
- Hassi, Lotta and Laakso, Miko (2011), 'Design thinking in the management discourse: Defining the elements of the concept', Conference paper at the 18th International Product Development Management Conference, 'Innovate Through Design', Delft, The Netherlands, 5-7 June 2011.
- Hawkins, Paul (2017), *Point to Point: A History of International Telecommunications During the Radio Years*, Berlin: De Gruyter Mouton.
- Hersted, Lone and Laustsen, Louise (2011), *Kreativ procesledelse: Nye veje til bedre praksis* (ed. M.O. Høier), Copenhagen: Dansk Psykologisk Forlag.
- Hersted, Lone, Lausten, Louise, and Obel Høier, Mille (2011), 'Kreativ procesledelse. Nye veje til bedre praksis'. Dansk Psykologisk Forlag.
- Hildebrandt, Steen (n.d.), 'Ledelse som et etisk og åndeligt anliggende – et venedpunkt', *Ånd i hverdagen*. Available at: <https://aandihverdagen.vaekstcenteret.dk/oversigt/steen-hildebrandt/>. Accessed 11 June 2022.
- Hildebrandt, Steen (2011), *Ledelse ifølge Hildebrandt – Det handler om menneskelige relationer*, Copenhagen: LibrisBusiness.
- Hildebrandt, Steen and Stubberup, Michael (2010), *Bæredygtig ledelse: Ledelse med hjertet*, Copenhagen: Gyldendal Business.
- Hill, Kim R., Walker, Robert S., Božičević, Miran, Eder, James, Headland, Thomas, Hewlett, Barry, Hurtado, A. Magdalena, Marlowe, Frank, Wiessner, Polly, and Wood, Brian (2011), 'Co-residence patterns in hunter-gatherer societies show unique human social structure', *Science*, 331:6022, pp. 1286–89.
- Hillgren, Per-Anders, Seravalli, Anna, and Emilson, Anders (2011), 'Prototyping and infrastructuring in design for social innovation', *CoDesign*, 7:3&4, pp. 169–83.
- Holloway, Ralph L. (1969), 'Culture, a human domain', *Current Anthropology*, 10:4, pp. 395–412.
- Hopkins, Terry (2008), *The Transition Handbook*, Paris: Hachette Books.
- Hopkins, Terry (2020), *From What Is to What of; Unleashing the Power of Imagination to Create the Future We Want*, Hartford: Chelsea Green Publishing.
- Hutchins, Giles and Laura, Storm (2019), *Regenerative Leadership: The DNA of Life-Affirming 21st Century Organizations*, Tunbridge Wells: Wordzworth.
- Ingold, Tim (2013), *Making: Anthropology, Archaeology, Art and Architecture*, London and New York: Routledge.

- Irwin, Terry (2015), 'Transition design: A proposal for a new area of design practice, study, and research', *The Journal of the Design Studies Forum*, 2:2, pp. 229–46.
- Irwin, Terry, Tonkinwise, Cameron, and Kossoff, Gideon (2013), 'Transition d: Re-conceptualizing whole lifestyles', *Head, Heart, Hand: AIGA Design Conference*, Minneapolis, 12 October 2013, <http://www.aiga.org/video-HHH-2013-irwin-kossoff-tonkinwise>. Accessed 11 June 2022.
- Jameson, Fredric (2003) 'Future city', *New Left Review* 21, <https://newleftreview.org/issues/1121/articles/fredric-jameson-future-city>. Accessed 11 June, 2022.
- Jaworski, Joseph, Scharmer, Otto and Senge, Peter (2005), *Presence: Exploring Profound Change in People, Organizations, and Society*, Boston: Nicholas Brealey Publishing.
- Johansson-Sköldberg, Ulla, Woodilla, Jill, and Çetinkaya, Mehves (2013), 'Design thinking: Past, present and possible futures', *Creativity and Innovation Management*, 22:2, pp. 121–46.
- Jones, J. Christopher (1992), *Design Methods*, New York: Van Nostrand Reinhold.
- Joos, Fortunat, Gerber, Stefan, Prentice, I. C., Otto-Bliesner, Bette L., and Valdes, Paul J. (2004), 'Transient simulations of holocene atmospheric carbon dioxide and terrestrial carbon since the last glacial maximum', *Global Biogeochemical Cycles*, 18:2, p. GB2002.
- Julier, Guy (2013), *The Culture of Design*, New York: Sage Publications.
- Kemppainen, David, Kopera-Frye, Karen, and Woodard, Julie (2008), 'The medicine wheel: A versatile tool for promoting positive change in diverse contexts', *Collected Essays on Learning and Teaching*. DOI: 10.22329/celt.v1i10.3183. Accessed 1 June 2022.
- Kenny, Anthony (2010), *A New History of Western Philosophy*, Oxford: Oxford University Press.
- Kimbell, Lucy (2011), 'Rethinking design thinking: Part 1', *Design and Culture*, 3:3, pp. 285–306.
- Kirtley, David Barr (2020), 'Dystopian fiction's popularity is a warning sign for the future', *Wired*. Available at: <http://www.wired.com/2014/12/geeks-guide-naomi-klein/>. Accessed 11 June 2022.
- Klein, Naomi (2020), 'Dystopian fiction's popularity is a warning sign for the future', *Wired*, 20 December, <http://www.wired.com/2014/12/geeks-guide-naomi-klein/>. Accessed 11 June 2022.
- Knapp, Jake, Zeratsky, John, and Kowitz, Braden (2016), *Sprint: How to Solve Big Problems and Test New Ideas in Just Five Days*, New York: Simon and Schuster.
- Kok, Jacobus and Van den Heuvel, Steven (eds) (2019), *Leading in a VUCA world: Integrating Leadership, Discernment and Spirituality*, London: Springer.
- Kolko, Jon (2010), 'Abductive thinking and sensemaking: The drivers of design synthesis', *MIT's Design Issues*, 26:1, pp. 15–28.
- Kolko, Jon (2012), *Wicked Problems: Problems Worth Solving*, Austin: Austin Center for Design.
- Kotovitch, Vasilije and Dorts, Kees (2016), 'The art of stepping back: Studying levels of abstraction in a diverse design team', *Design Studies*, 46, pp. 79–94.
- Krause Frantzen, Mikkel (2019), *En fremtid uden fremtid. Depression som politisk problem og kunstens alternative fortællinger*, Copenhagen: Informations Forlag.
- Laloux, Frédéric (2014), *Reinventing Organizations: A Guide to Creating Organizations Inspired by the Next Stage of Human Consciousness*, Brussels: Nelson Parker.
- Laloux, Frédéric (2018), *Reinventing Organizations: An Illustrated Invitation to Join the Conversation on Next-Stage Organizations*, Brussels: Nelson Parker.
- Lamarque, Peter (2010), 'Wittgenstein, literature, and the idea of a practice', *British Journal of Aesthetics*, 50:4, pp. 375–88.
- Lasso, Sarah Venturim, Cash, P., Daalhuizen, J., and Kreye, M. (2016), 'A model of designing as the intersection between uncertainty perception, information processing, and coevolution', in D. Marjanovic, M. Storga, N. Pavkovic, N. Bojetic and S. Skec (eds), *DS 84: Proceedings of the DESIGN 2016 14th International Design Conference*, Zagreb: Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb, Croatia, pp. 301–10.
- Latour, Bruno (2004), *Politics of Nature: How to Bring the Sciences Into Democracy*, Cambridge: Harvard University Press.
- Latour, Bruno (2015), *Reassembling the Social: An Introduction to Actor-Network Theory*, Oxford: Oxford University Press.
- Latour, Bruno (2017), *Facing Gaia: Eight Lectures on the New Climatic Regime*, Oxford: Polity Press.
- Latour, Bruno (2018), *Down to Earth. Politics in the New Climate Regime*, Oxford: Polity Press.
- Laville, Sandra (2020), 'Human-made materials now outweigh earth's entire biomass', *The Guardian*, 9 December 2020, sec. Environment. <https://www.theguardian.com/environment/2020/dec/09/human-made-materials-now-outweigh-earths-entire-biomass-study>. Accessed 11 June 2022.
- Lawson, Bryan (2005), *How Designers Think: The Design Process Demystified*, 4th ed., London: Routledge.
- Lears, T. J. Jackson (1981), *No Place of Grace: Antimodernism and the Transformation of American Culture, 1880–1920*, Chicago: University of Chicago Press.
- Lenin, V. I. (1924), 'Draft plan of scientific and technical work', in *Lenin's Collected Works* (ed. R. Daglish, trans. C. Dutt), vol. 27, 4th ed, Moscow: Progress Publishers, pp. 314–17.
- Lewin, Kurt (1947), 'Frontiers in group dynamics: Concept, method and reality in social science; equilibrium and social change', *Human Relations*, 1:1, pp. 5–41.
- Lewis, Simon L. and Maslin, Mark A. (2018), *The Human Planet: How We Created the Anthropocene*, New Haven: Yale University Press.
- Liedtka, Jeanne (2017), 'Evaluating the impact of design thinking in action', *Academy of Management Proceedings*, 2017:1, <https://doi.org/10.5465/AMB-PP.2017.177>. Accessed 11 June 2022.
- Lüttichau (2017), *Calling Us Home*, London: Head of Zeus.
- Maher, Mary Lou (1994). 'Creative design using a generic Algorithm'. American Society of Civil Engineers. ASCE Library: <https://cedb.asce.org/CEDBsearch/record.jsp?dockkey=0088820>. Accessed 11 June 2022.
- Malm, A. (2016), *Fossil kapital: The Rise of Steam Power and the Roots of Global Warming*, London: Verso
- Manzini, Ezio (1991), *Artefacts: Vers une nouvelle écologie de l'environnement artificiel* (trans. A. Pilia), Paris: Centre Georges Pompidou.
- Manzini, Ezio (1992), 'Prometheus of the everyday: The ecology of the artificial and the designer's responsibility', *Design Issues*, 9:1, pp. 5–20.
- Manzini, Ezio (2015), *Design, When Everybody Designs: An Introduction to Design for Social Innovation*, Cambridge: MIT Press.
- Maslow, Abraham H. (1966), *The Psychology of Science: A Reconnaissance*, New York: Harper Collins.
- Maslow, Abraham H. (1971), *The Farther Reaches of Human Nature*, New York: Viking.

- Maslow, Abraham H. (1998), *Toward a Psychology of Being*, 3rd ed., Hoboken: Wiley.
- McCann, Jack T. and Holt, Roger A. (2011), 'Sustainable leadership: A manufacturing employee perspective', *SAM Advanced Management Journal*, 76:4, pp. 4–14.
- McCarthy, Christopher, Fouladi, Rachel T., Juncker, Brian D., and Marthey, Kenneth (2011), 'Psychological resources as stress buffers: Their relationships to university students' anxiety and depression', *Journal of College Counseling*. <https://doi.org/10.1002/j.2161-1882.2006.tb00097.x>. Accessed 11 June 2022.
- Meadows, Donella H. (2008), *Thinking in Systems: A Primer* (ed. D. Wright), White River Junction: Chelsea Green Publishing.
- Meillassoux, Quentin and Badiou, Alain (2008), *After Finitude: An Essay on the Necessity of Contingency*, London: Continuum.
- Meroni, Anna (2007), *Creative Communities: People Inventing Sustainable Ways of Living*, Milan: Edizioni POLI.design.
- Micheli, Pietro, Wilner, Sarah J. S., Bhatti, Sabeen Hussain, Mura, Matteo, and Beverland, Michael B. (2019), 'Doing design thinking: Conceptual review, synthesis, and research agenda', *Journal of Product Innovation Management*, 36:2, pp. 124–48.
- Morin, Edgar (1973), *Le paradigme perdu: la nature humaine*, Paris: Seuil.
- Morris, William (1884), 'Art and socialism: A lecture delivered (January 23rd, 1884) before the secular society of Leicester'. Available at: <https://www.marxists.org/archive/morris/works/1884/as/as.htm>. Accessed 11 June 2022.
- Morton, Timothy (2007), *Ecology Without Nature: Rethinking Environmental Aesthetics*, Cambridge: Harvard University Press.
- Morton, Timothy (2010), *The Ecological Thought*, Cambridge: Harvard University Press.
- Morton, Timothy (2013), *Hyperobjects: Philosophy and Ecology after the End of the World*, Posthumanities, Minneapolis: University of Minnesota Press.
- Morton, Timothy (2017), *Humankind: Solidarity with Non-Human People*, Brooklyn: Verso.
- Orr, David (2004), *The Nature of Design: Ecology, Culture, and Human Intention*, Oxford: Oxford University Press.
- Ørsted, Christian (2013), *Livsfarlig ledelse – forstå de psykologiske mekanismer, der styrer dit arbejdsliv*, Copenhagen: Peoples Press.
- Papanek, Victor (1985), *Design for the Real World: Human Ecology and Social Change*, Chicago: Academy Chicago Publishers.
- Pelegrin, Jacques (1993), 'A framework for analysing prehistoric stone tool manufacture and a tentative application to some early stone industries', in A. Berthelet and J. Chavaillon (eds), *The Use of Tools by Human and Non-Human Primates*, Oxford: Oxford University Press, pp. 302–14.
- Prahalad, C. K. and Ramaswamy, Venkat (2004), 'Co-creating unique value with customers', *Strategy & Leadership*, 32:3, pp. 4–9.
- Purdy, Jedediah (2015), *After Nature: A Politics for the Anthropocene*, Cambridge: Harvard University Press.
- Pyne, Stephen J. (1997), *World fire: The culture of fire on earth*. Washington: University of Washington Press.
- Ramirez, Rafael, Ravetz, Jerry, Sharpe, Bill, and Varley, Leila (2019), 'We need to talk (more wisely) about wisdom: A set of conversations about wisdom, science, and futures', *Futures*. Elsevier. February 2019. <https://doi.org/10.1016/j.futures.2019.02.002>. Accessed 11 June 2022.
- Reed, Bill (2007), 'Shifting from "Sustainability" to regeneration', *Building Research & Information*, 35:6, pp. 674–80.
- Richardson, Kathrine (2019), *Hvordan skaber vi bæredygtig udvikling for alle?*, Copenhagen: Informations Forlag.
- Richmond, Barry (1994), 'Systems thinking/system dynamics: Let's just get on with it', *System Dynamics Review*, 10:2&3, pp. 135–57.
- Rifkin, Jeremy (2009), *The Empathic Civilization: The Race to Global Consciousness in a World in Crisis*, Cambridge: Polity.
- Rittel, Horst W. J. (1973), 'On the planning crisis: Systems analysis of the "First and Second Generations"', *Bedriftsøkonomien*, 8, pp. 390–96.
- Rittel, Horst W. J. and Webber, Melvin M. (1973), 'Dilemmas in a general theory of planning', *Policy Sciences*, 4:2, pp. 155–69.
- Rumi, Jalaluddin (2018). Let silence take you to the core of life. Amazon Digital Services LLC - Kdp Print Us. [https://www.amazon.de/-/en/Pup-Wolrd/dp/1086700511/ref=sr\\_1\\_1?crid=3112EX7XWNW0&keywords=let+silence+take+you+to+the+core+of+life&qid=1658055984&sr=8-1](https://www.amazon.de/-/en/Pup-Wolrd/dp/1086700511/ref=sr_1_1?crid=3112EX7XWNW0&keywords=let+silence+take+you+to+the+core+of+life&qid=1658055984&sr=8-1). Accessed 11 June 2022.
- Russell, Bertrand (1945), *A History of Western Philosophy, and Its Connection with Political and Social Circumstances from the Earliest Times to the Present Day* (Touchstone), New York: Simon & Schuster.
- Sanders, Elizabeth B.-N. and Stappers, Pieter Jan (2008), 'Co-creation and the new landscapes of design', *CoDesign*, 4:1, pp. 5–18.
- Sanders, Elizabeth B.-N. and Stappers, Pieter Jan (2014), 'Probes, toolkits and prototypes: Three approaches to making in codesigning', *CoDesign*, 10:1, pp. 5–14.
- Sanders, Elizabeth B.-N. and Stappers, Pieter Jan (2014), 'Cover Story: From designing to co-designing to collective dreaming: Three slices in time. IX Interactions. XXL6 November-December. <https://interactions.acm.org/archive/view/november-december-2014/from-designing-to-co-designing-to-collective-dreaming-three-slices-in-time>. Accessed 1 July 2022.
- Scharmer, Otto Claus (2003), 'The blind spot of leadership: Presencing as a social technology of freedom', Habilitation thesis. [https://www.ottoscharmer.com/sites/default/files/2003\\_TheBlindSpot.pdf](https://www.ottoscharmer.com/sites/default/files/2003_TheBlindSpot.pdf). Accessed 11 June 2022.
- Scharmer, Otto Claus (2007), *Theory U: Leading from the Future as It Emerges*, Cambridge: The Society for Organizational Learning.
- Scharmer, Otto Claus (2018), *The Essentials of Theory U: Core Principles and Applications*, Oakland: Berrett-Koehler Publishers.
- Schein, Edgar H. (2017), *Organizational Culture and Leadership*, 5th ed., Hoboken: Wiley.
- Schön, Donald (1983), *The Reflective Practitioner: How Professionals Think in Action*, London: Temple Smith.
- Senge, Peter (2006), *The Fifth Discipline: The Art and Practice of the Learning Organization*, revised ed., New York: Doubleday.
- Sharpe, Bill (2013), *Three Horizons: The Patterning of Hope*, England: Triachy Press.

- Shiner, Larry (2012), "'Blurred Boundaries"? Rethinking the concept of craft and its relation to art and design', *Philosophy Compass*, 7:4, pp. 230–44.
- Simmons, Matthew R. (2000), *Revisiting the Limits of Growth: Could the Club of Rome Have Been Correct After All?*, Oxford: Mud City Press.
- Simon, Herbert (1969), *The Sciences of the Artificial*, Cambridge: MIT Press.
- Solnit, Rebecca (2004), *Hope in the Dark. Untold Histories, Wild Possibilities*, Chicago: Haymarket.
- Steffen, Will, Broadgate, Wendy, Deutsch, Lisa, Gaffney, Owen, and Ludwig, Cornelia (2015), 'The trajectory of the Anthropocene: The great acceleration', *The Anthropocene Review*, 2:1, pp. 81–98.
- Steffen, Will, Grinewald, Jaques, Crutzen, Paul, and McNeil, John (2011), 'The Anthropocene: Conceptual and historical perspectives', *Philosophical Transactions of The Royal Society*, 369:1938, pp. 842–67.
- Stokes, Patricia D. (2006), *Creativity from Constraints: The Psychology of Breakthrough*, London: Springer.
- TeBrake, William H. (1975), 'Air pollution and fuel crisis in preindustrial London, 1250–1650', *Technology and Culture*, 16:3, pp. 337–59.
- Tharp, Bruce M. and Tharp, Stephanie M. (2019), *Discursive Design: Critical, Speculative, and Alternative Things*, Cambridge: MIT Press.
- Thomas, Daniel (2020), 'Davos 2020: People still want plastic bottles, says Coca-Cola', BBC News. <https://www.bbc.com/news/business-51197463>. Accessed 15 July 2022.
- Tobias, P.V. (1976), 'The brain in hominid evolution', in *Encyclopaedia Britannica. Macropaedia*, vol. 8, London: Encyclopaedia Britannica, p. 1032.
- Van der Ryn, Sim and Cowan, Stuart (2007), *Ecological Design*, tenth anniversary edition, Washington, DC: Island Press.
- VanPatter, G.K. (2020), *Rethinking Design Thinking*, New York: Humantific & Next Leadership Network.
- Venturi, Robert, Brown, Denise Scott, and Izenour, Steven (1972), *Learning from Las Vegas: The Gorgotten Symbolism of Architectural Form*, revised ed., Cambridge: MIT Press.
- Visser, Frank (2003), *Ken Wilber: Thought as Passion*, New York: State University of New York Press.
- Voelcker, John (2014), '1.2 Billion vehicles on World's Roads now, 2 billion by 2035: Report', *Green Car Reports*. Available at: [https://www.greencarreports.com/news/1093560\\_1-2-billion-vehicles-on-worlds-roads-now-2-billion-by-2035-report](https://www.greencarreports.com/news/1093560_1-2-billion-vehicles-on-worlds-roads-now-2-billion-by-2035-report). Accessed 11 June 2022.
- Vogt, Eric E., Brown, Juanita and Isaacs, David (2003), *The Art of Powerful Questions: Catalyzing Insight, Innovation, and Action*, Cambridge: Whole Systems Associates.
- Wahl, Daniel Christian (2016), *Designing Regenerative Cultures*, Charmouth: Triarchy Press.
- Wahl, Daniel Christian and Baxtor, Seaton (2008), 'The designer's role in facilitating sustainable solutions', *Design Issues*, 24:2, pp. 72–83.
- Wallas, Graham (1926), *The Art of Thought*, Tuscaloosa: Alabama University Press.
- Watson, Julia (2019), *Lo-TEK: Design by Radical Indigenism*, Cologne: Taschen.
- Western, Simon (2013), *Leadership: A Critical Text*, New York: Sage Publications.
- Whitney, Diana Kaplin and Trosten-Bloom, Amanda (2003), *The Power of Appreciative Inquiry: A Practical Guide to Positive Change*, Oakland: Berrett-Koehler.
- Wilber, Ken (2010), *Introduction to Integral Theory & Practice: IOS Basic and the AQAL Map*, New York: Springer.
- Wohlleben, Peter (2016), *The Hidden Life of Trees: What They Feel, How They Communicate Discoveries from A Secret World* (trans. J. Billingham), Vancouver: Greystone Books.
- Zhang, Jia Wei, Piff, Paul K., Iyer, Ravi, Koleva, Spassena, and Keltner, Dacher (2014), 'An occasion for unselfing: Beautiful nature leads to prosociality', *Journal of Environmental Psychology*, 37, pp. 61–72.



Page numbers in italics indicate references within diagrams or in captions.

Diagrams and captions are not indexed separately if included within a run of text references.

- 3D printers 195
- abductive serendipity 98–100, 118, 220
- abductive thinking 98, *111*, *216–17*, *248*  
see *also* thinking
- acidification of oceans 69  
see *also* oceans
- acupuncture  
container-building 193  
systems 166, *172–73*, *183*, *204*, *216–17*, *248*
- agency 14, 157, 225
- agrarian societies 55, 56, 72, 162, 225  
see *also* social systems
- AI (artificial intelligence) 52, *202–03*
- Aicher, Otl, quoted 74
- AirBnB 192
- alchemy 181
- ambiguity 35, *111*  
see *also* uncertainty
- amplitude 140, 182, *185*, *188*
- analysis *101*, *102*, *103*
- animistic thought 229  
see *also* wisdom traditions
- Anthropocene 23–28, *78–79*, *216–18*  
ontology of *137*, *216–17*, *248–49*
- Anthropocene design machine 46  
see *also* design machine
- app development 89–90
- artefacts, lilypond model 174, 177
- artificial intelligence (AI) 52, *202–03*
- assumptions 29, 180, *220–21*, *248*  
lilypond model 174–76, 177  
onto-epistemological 48, 78, 218
- attention 129, 133
- autopoiesis 168–69
- back-talk 102, *104*
- Bacon, Francis 57
- basic needs 157, 162, 220 see *also* needs
- Bauhaus 133
- Baxtor, Seaton 47–48, 50–51
- Beck, Don 47, 49–51, 60, 160
- Beck, Ulrik 178
- Beige Level 53, 72
- being 49, 129, 147, 151  
and doing 30–31, 32, *131*, *139*, *140*, *249*  
in the making 138–40, 146, 220, *248–49*
- beliefs 28, *174–75*, *177*, *180*  
see *also* assumptions
- Beyond Net Zero - A Systemic Design Approach* (British Design Council) *107*, *108*
- biodiversity 80, 96
- biopsychosocial systems 49  
see *also* spiral dynamics
- biosphere 69, 169–70
- Black Elk, quoted 224
- blind men and elephants 120, 123
- Blue Level 56, 61, 63, 73  
see *also* spiral dynamics
- Blue Marble photo 121
- Boer, Floria 215
- Boxing Future Health project 210–12
- British Design Council 106–110, 112
- Brundtland Report 41
- Buchanan, Richard 17, *18*, 20, 82, 83  
butterflies 170, 181
- Capitalocene 26
- car industry 172
- carbon dioxide 69
- carbon footprint 143, 213
- catalyze 107, *108*
- cause and effect 56, 225
- centralization 56
- challenge arenas 82–89  
see *also* hyperobjects

- change 133  
 resistance to 36, 166, 170–73  
 see also climate change;  
 transition periods; uncertainty
- circles 231–32, 234, 235  
 see also DesignWISE;  
 Medicine Wheel
- climate change 80, 137, 142–43, 215  
 and design 76–77  
 and Ørsted 207–09  
 response to 92, 124  
 viscosity 88–89  
 see also environmental crisis;  
 global warming
- co-creation 190, 191  
 see also Danish Design Center
- co-design 190–96, 201, 248  
 see also design
- co-evolution of problems and solutions  
 88–94, 95–97, 118, 248  
 see also wicked problems
- cognitive style 98  
 see also design thinking
- collaboration 85–86, 87, 190–203, 216–17
- comparison 157, 158, 162
- competition 63–64, 73, 151, 159
- complacency 58, 121, 150–51, 178
- complexity 83–85, 99, 124, 126, 131, 146  
 see also hyper-complexity;  
 wicked problems
- concepts 46
- conformity loop 247 see also loops
- connections 90, 108, 109, 135, 251  
 see also interconnections
- consciousness 34, 160–61, 175, 216–17  
 future 127  
 human 48–49  
 planetary 51, 73, 216–17, 248  
 tier-two 63  
 whole-earth 219
- consumerism 66
- container-building 182–83, 184–87,  
 216–17, 221, 248  
 acupuncture 193  
 creative 206  
 at Ørsted 208
- controlled retreat, and sea levels 214
- convergence 100–12, 118, 138, 140–45,  
 216–17, 248
- courses, and design process 102
- COVID-19, 137  
 and climate change 124  
 economic effects 64  
 response to 13–14, 90, 92, 124
- Cowan, Chris 47, 49–51, 60, 160
- create 107, 108
- creative communities 192
- creative containers 206 see also  
 container-building
- Cross, Nigel 90–92, 97
- Crusoe, Robinson 157
- Crutzen, Paul 23, 44–45
- Csikszentmihalyi, Mihaly 49, 138
- dams 68
- Danish Design Center (DDC) 207, 210–12
- Danish Oil and Natural Gas (DONG)  
 207–08
- De Urbanisten, architects 215
- deduction 98
- deficiency levels 47  
 see also needs
- deficiency needs 153  
 see also needs
- define 105, 106
- defocusing 138, 139, 140
- deliver 105, 106
- Denmark 207  
 see also Danish Design Center
- depression 62–63, 80
- derivative existential needs 156, 157–58  
 see also needs
- derivative needs 157, 220  
 see also needs
- Descartes, René 57, 78
- design 15–22, 27, 34, 44, 48  
 and climate change 76–77  
 co-design 190–96, 201, 248  
 diffuse 192, 194  
 ecological 18, 41  
 fifth dimension 17, 216–17, 219,  
 248–49  
 four orders of 17, 18, 83  
 industrial 15, 16  
 integrative function 20, 33, 88  
 interactive 16, 19  
 limitations 106–107  
 mindsets 31, 51, 106–07, 111, 145  
 models 185  
 planet-centred 18, 19, 30–31,  
 77–79, 86, 122, 219  
 premises of 16, 33–34, 248–49  
 as problem and solution 25  
 product design 16–17, 89–90  
 regenerative 41  
 speculative 16, 196–201, 202–03,  
 210, 211–12, 216–17, 248  
 sustainable 18, 39, 41  
 traditional 15–16, 19, 29, 30–31,  
 84, 110  
 transition 16, 213–17, 221, 248  
 workspace 200  
 see also meta-design;  
 wicked problems
- design doing 19
- design fictions 196  
 see also speculative design
- Design for the Real World*  
 (Papanek) 22, 39
- design futuring 16, 196  
 see also speculative design
- design innovation studies 187
- design machine 11–12, 23, 46, 52,  
 151–52, 226
- Design Methods* (Jones) 101
- design process 100–12, 114, 180  
 British Design Council 106–110  
 Dorst and Cross 90–92, 97  
 Fry 78–79  
 Jones 100–101  
 Kolko 99  
 Lawson 102, 103  
 Rittel and Webber 80–82  
 Sanders Pierce 98  
 Schön 98, 102, 104  
 VanPatter 82–88
- design studies 16, 33, 88
- design thinking 19, 20–22, 98, 100  
 see also thinking
- Design, When Everybody Designs*  
 (Manzini) 192, 194
- designerly approach 33–34, 114
- designers 192, 194
- Designing Regenerative Cultures*  
 (Wahl) 127
- DesignWISE 36, 231–51
- desires and needs 151–63  
 see also needs
- develop 105, 106
- development 62, 71, 72–73
- developmental psychology 34, 47,  
 51–52, 61
- diffuse design 192, 194  
 see also design
- Dinesen, Eva 235
- discipline-specific understanding  
 of design 15  
 see also design
- discover 105, 106
- disruption 188
- disruption loop 246–47  
 see also loops
- divergence 100–12, 118, 120, 138, 140–45,  
 216–17, 248
- diversity 185, 187, 250
- doing  
 and being 30–31, 32, 131, 139,  
 140, 249  
 design 19  
 and thinking 20, 32, 220
- domestication of plants and animals 24
- DONG (Danish Oil and Natural Gas)  
 207–08
- Dorst, Keest 90–92, 119
- Double Diamond model 105, 106–110, 112
- doubly derivative needs 157, 158, 220  
 see also needs
- dreams 160, 164, 206  
 see also social dreaming; utopias
- dualism 24, 78, 135
- Dunne, Anthony 196, 198
- dystopias 52, 204–05
- earth system trends 66, 69
- earth-wisdom 226, 235–36  
 see also wisdom traditions
- ecological design 18, 41  
 see also design
- economics  
 and COVID-19 64  
 GDP 68, 70  
 investment 68  
 socio-economic trends 66,  
 68, 213  
 taxation 56, 162  
 wealth ownership 64–65, 173–74  
 see also money
- ego 53, 55, 60
- elaborating symbol 232  
 see also Medicine Wheel
- elements, and systems thinking 167  
 see also systems thinking
- elephants and blind men 120, 123
- Eliade, Mircea 231–32
- empires 55
- energy production and use 68, 207–09
- Enlightenment 57, 73
- Eno, Brian, quoted 164
- entanglement 80, 94, 251  
 see also interconnections
- environmental crisis 14–15  
 see also climate change
- environmentalism 58
- equality 59, 137
- evaluation 101, 103
- evolution 42, 60, 167–68  
 human 48–49, 53–60, 61, 225  
 theory 33, 34
- existential needs 156–63  
 see also needs
- exit strategies 65
- experience design 16  
 see also design
- explore 107, 108
- fertilizer 68
- fifth dimension of design 17, 216–17, 219,  
 248–49 see also design

- fifth-generation model 107  
 fire 45, 46  
 First Horizon thinking 127, 128  
   see *also* thinking  
 first-tier thinking 49  
   see *also* thinking  
 fish capture 69  
 flat ontology 137  
   see *also* ontology of the Anthropocene  
 flow 138, 248  
 food production and storage 56  
 forest-bathing 135, 136  
 four orders of design 17, 18, 83  
   see *also* design  
 fourth-generation model  
   see Double Diamond model  
*Frame Innovation* (Dorst) 92  
 framing 104, 112, 119–20  
   see *also* reframing  
 Frankel, Viktor 157  
 Fry, Tony 78  
 Fuller, Buckminster 38  
 function, and systems thinking 167  
   see *also* systems thinking  
 furniture production 142–43  
 future consciousness 127  
   see *also* consciousness  
 futures 119, 196–99  
   see *also* imagination; social dreaming; utopias  
 futuring design 16, 196  
   see *also* speculative design  
 fuzzy situations 85, 92
- Gandhi, Mahatma, quoted 148  
 GDP 68, 70 see *also* economics  
 Ghosn, Carlos 172  
 global warming 69, 80  
   see *also* climate change  
 gods 56, 226  
 Gordian knot 92  
 Graeber, David Wolf, quoted 10  
 graphic communication 15, 16, 18  
 Graves, Clare 47, 48–49, 62  
 Great Acceleration 57, 66–73, 246  
 great outdoors 178  
 green energy 207–09  
 Green Level 58, 61–63, 70, 73  
 growth needs 153  
   see *also* needs  
 Guangxi, China, Liuzhou Forest City 79, 205
- Haasnoot, Marjolijn 214  
 handaxes 46  
 happiness 173–74, 202–03  
 Harari, Yuvel 46  
 Haraway, Donna 137  
 health sector, Denmark 210–12  
 Heisenberg, Werner 186  
 hierarchy of needs 36, 152–63, 216–17, 248 see *also* needs  
 Hitachi Kyoto University Laboratory, Japan 203  
 holarchies 59  
 holistic thinking 50, 60, 249  
   see *also* thinking  
 Holocaust 157  
 hope 109, 157–59, 214  
   see *also* optimism  
*Hope in the Dark* (Solnit) 214  
 Hopkins, Rob 213  
 horizontal perspective 35, 119  
   see *also* perspective
- horizontal zooming 119–28, 144, 145, 188  
   see *also* zooming  
 How-phase 216–17, 248–49  
 humans  
   evolution 48–49, 53–60, 61, 225  
   limitations 229  
   and nature 25, 44, 51, 57, 61, 74, 226–27, 236  
   primacy of 72, 124, 137, 175, 178, 236  
 hunter-gatherers 54, 72  
 Hutchins, Giles 135  
 hyper-complexity 35, 111, 129, 138, 147, 217 see *also* complexity;  
   the trouble  
 hyperobjects 80–83, 114, 124, 129  
   and wicked problems 80–83, 88–89, 96, 114  
   viscosity of 88–89
- IDOART 184  
 imagination 14, 23, 36, 46, 164  
   see *also* futures; social dreaming;  
   speculative design; utopias  
 immune systems 170, 181, 220  
   see *also* resistance to change  
 Incubate 244, 246, 248–49  
 indigenous cultures 130, 226–29  
   see *also* wisdom traditions  
 Indigenous Ways Of Knowing (IWOK) 227  
   see *also* wisdom traditions  
 individualism 57, 160  
 Induce 244, 246, 248–49  
 induction 98  
 industrial design 15, 16  
   see *also* design  
 Industrial Revolution 23–24, 57, 70  
 industrial societies 72, 225  
   see *also* social systems  
 industrialization 15, 58, 67  
 inequality 64–65  
 information society 73  
   see *also* social systems  
 Ingels, Bjarke 65  
 Ingold, Tim 46  
 Initialize 242, 248–49  
 InJoy 245, 247, 248–49  
 inner perspective 132  
   see *also* perspective  
 innovation 236, 246, 249  
 innovation theatre 246  
 Inseminate 243, 248–49  
 Inspirit 243, 246, 248  
 Integrate 245, 247, 248–49  
 integrating symbol 232  
   see *also* Medicine Wheel  
 integrative function of design 20, 33, 88  
   see *also* design  
 interactive design 16, 19  
   see *also* design  
 interconnections 78, 167, 182, 215, 226  
   see *also* connections;  
   entanglement; wicked problems  
 Intuit 242, 248–49  
 investment 68  
   see *also* economics  
 iPhones 96  
 ISIS 192  
 iterative models 102, 106  
   see *also* loops  
 Itten, Johannes 133  
 ivory tower loop 246  
   see *also* loops  
 IWOK Indigenous Ways of Knowing 227  
   see *also* indigenous cultures;  
   wisdom traditions
- Japan 202–03  
 Jobs, Steve 96  
 Jones, John Christopher 100–101  
 journeys 108, 109, 235  
 Jung, Carl 181
- kairos state 136  
 Klein, Naomi 204  
 Kolko, Jon 99  
 Kontrapunkt 208–09  
 Kossoff, Gideon 213  
 Kuma, Outi 235
- Laloux, Frederic 47, 51, 60, 65  
 land use 69  
 last-mile challenges 195  
 Latour, Bruno 135  
 Lawson, Bryan 102, 103  
 leadership 36, 108, 109, 182–83  
 leap of faith 97  
 Lewis, Simon 24  
 lilypond model 174–80, 216–17  
*The Limits to Growth* 66, 167  
 linear processes 91, 100–101, 114  
   see *also* time, linear  
 Liuzhou Forest City, Guangxi, China 79, 205  
 loops 93, 141, 246–47  
   see *also* iterative models  
 Luhmann, Niklas 168–70  
 Lüttichau, Chris 235
- macro-level actions 60, 125  
 Madsebakke, Bornholm, Denmark 234  
 magical societies 54, 229  
   see *also* social systems  
 making, being in the 138–40, 146, 220, 248–49  
 Manzini, Ezio 76, 192, 194, 201  
 Maslin, Mark 24  
 Maslow, Abraham 36, 152–63  
 materiality 78–79  
*The Matrix* 175–76  
 Maturana, Humberto 168  
 Meadows, Donella H. 167, 173  
 Medicine Wheel 231–35  
   see *also* wisdom traditions  
 meditation 133, 134, 136  
 Meillassoux, Quentin 178  
 memes see vMEMES  
 Meroni, Anna 192  
 meta-design 28, 36, 184, 216–17, 218–19, 229–30, 248  
   definitions 48  
   and human evolution 61  
   and utopias 204  
   and vMEMES 49  
   see *also* design  
 methane 69  
 mindfulness 133, 135  
 mindsets 73, 100, 120  
   of design 31, 51, 106–07, 111, 145  
   human-centred 72, 124  
   integrative 88  
   postmodern 62–63  
   system 226  
   see *also* convergence;  
   divergence; perspective;  
   zooming  
 models  
   for and in design 185  
   and wicked problems 142–43  
 money 64, 178  
   see *also* economics  
 Morton, Timothy 24, 80, 88, 124, 135



- motivational psychology 152, 155, 162  
     see also psychology  
 Musk, Elon 65
- naming 104  
 nature 42, 169–70  
     and gods 56  
     and humans 25, 44, 51, 57, 61, 74, 226–27, 236  
     and materiality 78–79  
     as other 57  
     and power 135–37  
 needs 23, 31, 162  
     basic 157, 162, 220  
     deficiency 153  
     derivative 157, 220  
     derivative existential 156, 157–58  
     desires 151–63  
     doubly derivative 157, 158, 220  
     existential 156–63  
     growth 153  
     physiological 156–63  
     see also hierarchy of needs; values  
 neovitalism 77, 79  
 Netherlands 214–15  
 net zero 107  
 never-been-built solutions 195  
 new materialism 77, 79  
 New York, USA, Upper West Side 79  
 New Zealand 173–74  
 Nike 191  
 nitrogen 69  
 nitrous oxide 69  
 Not Impossible design group 195  
 nuclear weapons 26
- oceans  
     acidification 69  
     plastic in 12, 80, 120–22, 124, 126  
     sea levels 214–15  
 onto-epistemological assumptions 48, 78, 218 see also assumptions  
 ontology of the Anthropocene 137, 216–17, 248–49  
     see also Anthropocene  
*Operations Manual for Spaceship Earth* (Fuller) 38  
 Oppenheimer, Julius Robert 26  
 optimism 52, 63, 67, 205, 213  
     see also hope  
 Orange Level 57, 63, 65–67, 70, 73  
 organizational psychology 169  
     see also psychology  
 orientation 108, 109–10, 184  
 Orr, David, quoted 42, 62, 161, 190  
 Ørsted 207–09  
 othering 57, 72  
 ozone 69
- panpsychism 77, 229  
     see also wisdom traditions  
 Papanek, Victor 22, 39  
 paper production 68  
 Paris Agreement 63, 64, 92
- perspective 33–34, 120, 127, 129, 188  
     and AI 52  
     and challenge arenas 86  
     horizontal 35, 119  
     inner 132  
     loss of 144  
     planetary 30–31, 61, 77, 124–25, 146  
     systemic 167–68  
     vertical 35  
     and wicked problems 82, 124  
     see also convergence; divergence; mindsets; realities; zooming  
 Pfizer 195  
 physiological needs 156–63  
     see also needs  
 Piaget, Jean see developmental psychology  
 Pierce, Charles Sanders 98  
 planetary consciousness 51, 73, 216–17, 248 see also consciousness  
 planetary perspective 30–31, 61, 77, 124–25, 146  
     see also perspective  
 planet-centred design 18, 19, 30–31, 77–79, 86, 122, 219  
     see also design  
 plastic in the oceans 12, 80, 120–22, 124, 126  
     see also oceans  
 politics 63–64, 120, 171, 202–03, 213  
*Politics of Nature* (Latour) 135  
 polytheism 56  
 population 68  
 power, and nature 135–37  
 preferences 27–29  
 pregnancy 170, 181  
 presencing 132–33, 134, 146  
 problems, co-evolution of 88–94, 95–97, 118, 248  
     see also wicked problems  
 product design 16–17, 89–90  
     see also design  
 production loop 246–47  
     see also loops  
 progress 23, 97, 212, 225  
 prosthetics 195  
 prototyping 14, 21, 82, 104, 200, 201  
 psychology  
     developmental 34, 47, 51–52, 61  
     motivational 152, 155, 162  
     organisational 169  
 PTSD 136  
 Purdy, Jedidiah 24–25  
 Purple level 54, 72  
 purpose 71, 147, 167, 178  
     see also systems thinking  
 pyramidal social structure 64–65  
     see also social systems
- Raby, Fiona 196, 198  
 Ramirez, Rafael, quoted 116  
 realities 56, 78–79, 164, 169–70, 229–30  
     see also perspective  
 Red level 55, 64, 72  
 redpilling 173–76, 180, 216–17, 248  
 reflection in action 98, 129  
 reflection loop 246  
     see also loops  
 reframing 107, 108, 248  
     see also framing  
 regenerative design 41  
     see also design  
 relationality 77, 78, 86, 94
- relationships 108, 109  
     see also connections  
 Renaissance 57, 73  
 resistance to change 36, 166, 170–73, 188  
     see also change; immune systems  
 responsibility 25, 30, 39, 61, 163  
 resting on laurels loop 247  
     see also loops  
 Rittel, Horst 80–82  
 Rumi, quoted 132
- safety 153, 154, 163, 173–74  
 Sanders, Elisabeth 198  
*Sapiens* (Harari) 46  
 Scharmer, Otto 160, 176, 132–33  
 Schein, Edgar 174–75, 177, 180  
 Schön, Donald 98, 102, 104  
*The Sciences of the Artificial* (Simon) 27  
 Scientific Management 56  
 SDGs (Sustainable Development Goals) 63, 92, 142–43, 171  
 sea levels, Netherlands 214–15  
     see also oceans  
 Second Horizon Thinking 127, 128  
     see also thinking  
 second-generation methods 102  
 second-tier thinking 49–50, 65  
     see also thinking  
 self-creation 168–69  
 self-organizing systems 168–70, 172  
     see also systems  
 self-referential systems 168–70, 178  
     see also systems  
 Senge, Peter 132, 170, 181  
 serendipity see abductive serendipity  
 service design 16  
     see also design  
 Seven Generation Principle 125, 231  
 Sharpe, Bill 127, 128  
 shrimp aquaculture 69  
 Sierra Leone 195  
 silent knowledge 227  
     see also wisdom traditions  
 silos 33, 116, 122, 125, 146, 246  
 Simon, Herbert 27  
 simplicity 124, 138  
 simultaneity principle 186  
 Singapore 205  
 slavery 55  
 social dreaming 196–98, 200, 204, 207–10, 211–12, 221, 248  
     see also dreams; futures; imagination; speculative design; utopias  
 social media 23, 71  
 social systems 50, 56, 64, 168–69, 192  
     agrarian 55, 56, 72, 162, 225  
     industrial 72, 225  
     information 73  
     magical 54, 229  
     pyramidal 64–65  
     see also spiral dynamics  
 socio-economic trends 66, 68, 213 see also economics  
 Solar Punk 204–05  
 solidarity 72, 135  
 Solnit, Rebecca 214  
 solutions, co-evolution of 88–94, 95–97, 118, 248  
 specialisms 116, 144, 146  
 speculative design 16, 196–201, 202–03, 210, 211–12, 216–17, 248  
     see also design; imagination; social dreaming

- Speculative Everything. Design, Fiction and Social Dreaming* (Dunne and Raby) 196, 198
- speculative realism 77, 79  
see also realities
- spiral dynamics 34, 48, 50, 53–60, 73  
see also social systems; thought systems
- Stappers, Pieter 198
- states, first establishment of 56
- Stefano Boeri Architetti 79
- Steffen, Will 44–45
- Stoermer, Eugene 23
- Storm, Laura 135
- storytelling 108, 109
- stress alleviation 136
- Sudan 195
- surface temperature 69  
see also climate change; global warming
- sustainability 39, 51, 65–66, 72, 167–68, 231  
definitions 41, 47–48  
lilypond model 177  
Ørsted 207–09
- sustainable design 18, 39, 41  
see also design
- Sustainable Development Goals (SDGs) 63, 92, 142–43, 171
- sustenance levels 49  
see also needs
- synthesis 101, 103, 111
- system-external world 169–70
- system(ic) leadership 33, 34, 36, 166, 181–83
- systemic perspective 167–68  
see also perspective
- systems 178  
self-organizing 168–70, 172  
self-referential 168–70, 178  
thought 98–100  
see also social systems
- systems acupuncture 166, 172–73, 183, 204, 216–17, 248
- systems theory 167, 172–80
- systems thinking 38, 167, 226  
see also purpose; thinking
- tame problems 81  
see also wicked problems
- taxation 56, 162  
see also economics
- Taylor, Frederick W. 178
- Taylorism 56
- TEAL management 60
- teenagers 61, 158
- telecommunications 68
- temperatures 69
- Theory U 132–33
- thinking  
abductive 98, 111, 216–17, 248  
design 19, 20–22, 98, 100  
and doing 20, 32, 220  
First Horizon 127, 128  
first-tier 49  
holistic 50, 60, 249  
Second Horizon 127, 128  
second tier 49–50, 65  
systems 38, 167, 226  
see also thought systems
- third-generation methods 102
- thought systems 98–100  
see also spiral dynamics; thinking
- Three Horizons Framework 127, 128, 198
- tier-two consciousness 63  
see also consciousness
- Tillge, Peter 235
- time  
cyclical 226  
linear 56, 225–26  
Seven Generation Principle 125, 231  
and stress 136  
and success 193  
three-fold division of 198  
see also zooming
- tools, and concepts 46
- tourism 68
- 'Toward Enabling Ever More People to Live Happily in 2050' project 202–03
- tradition 15–16, 19, 29, 30–31, 49, 84  
and innovation 236, 249  
see also wisdom traditions
- traditional design 15–16, 19, 29, 30–31, 84, 110  
see also design
- transcendence 135, 154, 155–56
- transformation 171, 172–73, 175–76, 181, 186–88 see also Ørsted
- transition design 16, 213–17, 221, 248  
see also design
- transition periods 62–63  
see also change; uncertainty
- Transition Town Movement 213
- transportation 68
- tropical forests 69
- the trouble 35, 88, 111, 137, 188, 220  
see also hyper-complexity
- Turquoise level 60, 65–66, 70
- Tutu, Desmond, quoted 222
- Uber 192
- U-model 132–33
- UN Sustainable Development Goals (SDGs) 63, 92, 142–143, 171
- uncertainty 35, 82, 98, 111, 127  
see also change; transition periods
- urgency 213, 214
- utopias 52, 204–05, 221, 248  
see also futures; imagination; social dreaming
- vaccination 195
- Valera, Francisco 168
- value memes see vMEMES
- values 61, 129, 151–52, 204, 248  
lilypond model 174–76, 177  
see also needs
- VanPatter, G.K. 82–86, 92
- Vermeulen, Marco 215
- vertical perspective 35  
see also perspective
- vertical zooming 119–28, 144, 145, 188  
see also zooming
- vipassana 133
- viscosity of hyperobjects 88–89  
see also hyperobjects
- vision-setting 108, 109–10
- visualising 189
- vMEMES (value memes) 34, 49
- Wahl, Daniel Christian 47–48, 50–51, 127, 128
- water use 68
- wealth ownership 64–65, 173–74  
see also economics
- Webber, Melvin 80–82
- What-phase 216–17, 248–49
- wheels see Medicine Wheels
- Whole Earth catalogues 38
- whole-earth consciousness 219  
see also consciousness
- whole-earth dynamics 60
- Who-phase 216–17, 248–49
- Why-phase 216–17, 248–49
- wicked problems 35, 92, 93, 111, 114, 216–17, 248  
and hyperobjects 80–83, 88–89, 96, 114  
exploratory approach 97, 100  
modelling 142–43  
and perspective 82, 124  
see also complexity; interconnections; plastic in the oceans; problems; zooming
- Wilber, Ken 47, 48–49, 60, 63
- wisdom traditions  
earth 226, 235–36  
panpsychism 77, 229  
silent knowledge 227  
see also indigenous cultures
- Wittgenstein, Ludwig 29
- workspace design 200  
see also design
- World Commission on Environment and Development 41
- World Town Plan* (Fuller) 38
- worldviews 47, 65–66, 72–73, 218, 229
- X-Factor 193
- Yellow level 59, 65–66, 70
- zooming 30–31, 146, 216–17, 219–20  
and container-building 184–85  
horizontal 119–28, 144, 145, 188  
in and out 111, 112, 120, 124–25, 126, 142–43, 171, 248–49  
in space 145, 146, 219, 248  
temporal 119, 125, 127, 145, 146, 219, 248  
vertical 119–28, 144, 145, 188  
see also mindsets; perspective; wicked problems

This book could not have been written without help, inspiration and support from the following people. I am particularly grateful for my wonderful external editor and translator Sophus Helle, who during his work on the manuscript sharpened the book's language and argument. I also owe a huge thanks to Associate Professor at the University of Copenhagen Anders Michelsen, who read and commented on early drafts of the chapters. I would also like to thank my former Head of Research and good friend Thomas S. Rasmussen, who helped me translate the final sections of the book that were added after peer-review and suggestions from friends and colleagues. Thomas also suggested a number of cuts where I had strayed into digressions. A heartfelt thanks also go to my colleagues at The Royal Danish Academy's School of Design for their helpful suggestions; particularly to Professor Mads Quistgaard, whose sharp questions about the premise of the book helped me refine my claims and models: thanks for your bird's eye view and your original thinking. Thank you also to Henriette Melchiorson

for your insightful comments about the zoom model, to Associate Professor Bodil Bøjer, doctoral student Anna Skaarup, and Assistant Professor Christina Funder for your great suggestions and your participation as guinea pigs for the DesignWISE tool. I would also like to thank all my students – both my graduate and continuing education students – for whom I presented the ideas and models of the book and who helped me get to the heart of the project. Thank you also to Charlie Breindahl for his help getting the reference list and alternative picture text for the e-book version in place and to Claudia Rebecca Juul for her help providing permissions for illustrations. Thanks especially to my collaborator and friend Sune Kjems, without whom this book might not have been written: he was the one who suggested that I should write a book about planet-centred design drawing on indigenous wisdom traditions, which we discovered together at the Academy's summer school and also with great help from Gry Guldberg. Thank you to Outi Kuma, earth wisdom keeper and Maya reader, for your wise and vital comments on Chapter 6. I also owe a great debt of gratitude to Dean Mathilde Aggebo and former Head of Department Martin Sønderlev, who provided indispensable financial support for the book. Last but not least, my greatest thanks go to my love and husband Nils Vinding, who not only supported me personally along the way, but who has also been my most valuable sparring partner about the book's idea and progression, and who helped me develop several of the book's models, including the revised hierarchy of needs and the DesignWISE tool.

First published in the UK in 2023 by  
Intellect, The Mill, Parnall Road, Fishponds, Bristol, BS16 3JG, UK

First published in the USA in 2023 by  
Intellect, The University of Chicago Press, 1427 E. 60th Street,  
Chicago, IL 60637, USA

 Intellect/The Author

The publication of this book was made possible through the generous support of the New Carlsberg Foundation.



Some rights reserved. Without limiting the rights under copyright reserved above, any part of this book may be reproduced, stored in or introduced into a retrieval system, or transmitted, in any form or by any means (electronic, mechanical, photocopying, recording or otherwise).

A catalogue record for this book is available from  
the British Library.

Copy editor: MPS Limited  
Cover designer: Linn Henrichson, Troels Faber/NR2154  
Cover image: Linn Henrichson  
Production manager: Laura Christopher  
Typesetter: Troels Faber/NR2154

Print (h/bk) ISBN 978-1-78938-715-5  
Print (p/bk) ISBN 978-1-78938-718-6  
ePDF ISBN 978-1-78938-717-9  
ePUB ISBN 978-1-78938-718-6

To find out about all our publications, please visit our website.  
There you can subscribe to our e-newsletter, browse or download our  
current catalogue and buy any titles that are in print.

[www.intellectbooks.com](http://www.intellectbooks.com)

This is a peer-reviewed publication.





*Design for the New World: From Human Design to Planet Design* introduces a new paradigm in design and design thinking, shifting our approach from a human-centred perspective to a planet-centred perspective, in which design is always guided by the ambition to create a balanced coexistence between humans and the other species that make up the global ecosystem.

This book connects traditional design thinking with ongoing debates about the Anthropocene and innovative perspectives from systems thinking, systemic leadership, and indigenous practices. Intervening in current discussions within design research about the role design can play in the sustainable transition, it offers new methods and mindsets to handle the scale and complexity of the climate and environmental crisis, and practical tools to turn theoretical reflections into transformative practice.



Ida Engholm is a professor of design history and design theory at the Royal Danish Academy. She has authored and co-authored twelve books on design and some ninety research papers and other articles, including several catalogues and book chapters. Engholm is co-founder of the research journal *Artifact: Journal of Design Practice* and a member of the Danish Design Council.