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Design beyond Design

Abstract As organizations struggle to respond to a world in which problems are becoming more open, complex and increasingly networked, many have turned to design thinking as a way to obtain solutions and achieve innovation. In this article, I will focus on the question of whether the current design paradigm is capable of delivering on these expectations, or whether design is overextended when dealing with areas of great complexity, such as in the social realm. The fact that at its core, design reasoning or design abduction requires the consideration of two unknowns more or less simultaneously (the "what" *and* the "how") puts a heavy strain on our human cognitive limitations in the best of times – and doubly so in highly complex problem situations. Over the years, expert designers have developed an elaborate array of coping strategies to contend with this issue. All of these help to a degree, but the fundamental issue remains. Design might be limiting itself by approaching complex problem situations through a 'problem solving' perspective. In this article, a radically different approach is explored, which takes the complex nature of the problem situation as its starting point, and reframes the task of design as system transformation, rather than the creation of a solution. An example from practice illustrates this new design paradigm.

Keywords
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Introduction

Many public and private organizations struggle with today's complex, networked problems.[1] In search of novel problem solving strategies, some have turned to the design professions and sought to adopt design thinking tools and techniques. As it turns out, this is not always a straightforward process.[2] Design as we know it has been shaped in a very specific context, and thus comes with its own set of assumptions, biases, and historical legacies. Applying design practices beyond this normal design context is bound to bring up issues that require design to adapt and change to stay in tune with its new role in its new environment.

In this viewpoint article, we will explore three questions:

1. Has design reasoning hit the ceiling in regards to the complexity it can handle (in a fundamental sense)?
2. If not, would it be it possible to evolve existing design approaches to deal with greater complexity?
3. Otherwise, does this call for a more fundamental shift – do we need to move towards a new design paradigm?

We will use developments found in the burgeoning practice of social design to illustrate design's struggle to address extremely complex problem situations.

Hitting the Ceiling

In its evolution from craft to sophisticated professional practice and academic discipline,[3] design has always had to find novel ways of dealing with the ever-increasing complexity of the problems it needed to address. It has hit the ceiling again and again, and always managed to adapt and change with the times.

The evolution of various design disciplines can be partially understood in these terms. Let us take the development of industrial design in the West as an example. Its history begins in the Middle Ages, when objects for use were made by craftsmen who fluently combined designing and making in a single creative practice. The Industrial Revolution created the need for a separate design profession that could give form to industrially manufactured products.[4] After WWII, increasing technical complexity plus the need for efficiency in mass production forced designers beyond classic form-giving (*Gestaltung*) to consider many other aspects of a product – technology, form, ergonomics, business needs, and so on – in a more integrated manner.

The central idea behind this new incarnation of industrial design was that to truly integrate these concerns, one would need a single person to keep track of the thinking governing every aspect of a product. The assumption being that it would be possible for a single person – the *integrated product designer* – to keep the requisite knowledge in his or her head, and integrate the various strands of thinking in an effective and timely manner.

Due to the growing complexity of design problems and designed outcomes, this assumption no longer holds. Industrial design is now a process undertaken by teams of specialists working together. But even multidisciplinary design teams are not the answer – much of the complex knowledge that needs to feed into a design is about the user. The multi-layered interactions that now take place between people and products has led to the development of co-design practices that can incorporate the user perspective in product development upstream; prospective users have become active participants in design projects and processes.[5]

Please note that this should not be read as a linear story in which a single new design paradigm has replaced the old – many forms of design co-exist today. Design is branching out, each challenge leading to a new limb on the tree of design disciplines.

1 Hans Boutellier, *The Improvising Society: Social Order in a World without Boundaries* (The Hague: Eleven, 2013).

2 Lisa Carlgren, Maria Elmquist, and Ingo Rauth, "The Challenges of Using Design Thinking in Industry—Experiences from Five Large Firms," *Creativity and Innovation Management* 25, no. 3 (2016): 344–62, DOI: https://doi.org/10.1111/caim.12176.

3 Ilpo K. Koskinen and Kees Dorst, "Academic Design," in *Proceedings of the 20th International Conference on Engineering Design (ICED 15), Vol. 11: Human Behaviour in Design*, ed. Christian Weber et al. (Milan: Politecnico di Milano, 2015), 227–34, available at https://www.designsociety.org/publication/38015/ACADEMIC+DESIGN.

4 John Heskett, *Industrial Design* (London: Thames and Hudson, 1980).

5 Mieke van der Bijl-Brouwer and Kees Dorst, "Advancing the Strategic Impact of Human-Centred Design," *Design Studies* 53 (November 2017): 1–23, DOI: https://doi.org/10.1016/j.destud.2017.06.003.

As an example of the next complex challenge to the discipline of design, let us turn to social design.[6] There are several reasons for design to move into the role of contributing to societal change. One reason is that the conventional problem solving approaches that prevail in the public sector deal with complex social challenges by splitting them up into sub problems, often in a way that is directly tied to professional and organizational structures.[7] This effectively creates another problem: the need to integrate partial solutions into a coherent whole later on. A more integrated, holistic, design-like approach throughout the project could be more efficient and lead to better outcomes.

Another reason design is ready to contend with societal challenges is that while many complex problems are approached from a technological/technocratic perspective, much of the complexity in today's problems stems from the human domain. Design, as a natural bridge-builder between technology and humanity, is ideally positioned to contribute.

But this is not easy. Social design requires designers to manage multiple stakeholders in the problem space as well as in the solution space, and it requires the combination and eventual integration of multiple fields of professional knowledge into what are often very complex product-service combinations. This hypercomplexity has to be dealt with in a situation where there often is no clear user and/or clear (single) client to guide the designer through the design process. This later point is important: early attempts to do 'social design' by directly applying conventional design practices to societal issues often led to simplistic and naïve solutions. This was possible caused by the fact that in 'normal' design projects, the client has the role of continually feeding professional knowledge into the design project, and questioning the assumptions that could creep into the developing solutions. However, in social design there often is no clear (single) client, so assumptions can easily go unchecked.[8] This application of design beyond its normal field of operation thus highlights a crucial element of design practice (in this case the role of the client) we might not have been aware of – within normal design practice, the role of the client is largely taken for granted (and consequently, the role of the client has hardly been an object of study within design research).

But is designerly thinking[9] really suited to hypercomplex challenges, or has design reasoning finally hit the ceiling of what it can do?

Design Reasoning

To address these pressing questions, let us take a step back and consider the pattern of reasoning at the core of design. According to formal logic, the world is made up of *elements*, which are the "what" of a reasoning process; the *connections* between these elements, which we may call the "how" of a process; and the *outcome* of the reasoning process, in which the elements have interacted.[10] We can understand the basic reasoning patterns of human problem solving by comparing different sets of the knowns and unknowns in an equation that might look like this:

WHAT + HOW leads to OUTCOME

There are four basic patterns of reasoning: *deduction, induction, normal abduction*, and *design abduction*.[11] Leaving the first three aside, we will focus here on design abduction. In design abduction, to begin with, all we know is something about the outcome, the desired value.

???? + ???? leads to OUTCOME

6 Nynke Tromp and Paul Hekkert, *Designing for Society: Products and Services for a Better World* (London: Bloomsbury, 2019).

7 Marcel J.C.M. Hertogh and Edward Westerveld, *Playing with Complexity: Management and Organisation of Large Infrastructure Projects* (Rotterdam: Erasmus University, 2010), available at http://hdl.handle.net/1765/18456.

8 Roderick J. Walden and Kees Dorst, "The Integration of Design Parameters and the Establishment of Constraint and Priority for Innovation," in *Proceedings of the DesignEd Asia Conference 2013* (Hong Kong: Hong Kong Polytechnic University, 2013), 1–9, available at http://www.designedasia.com/2013/proceedings.php.

9 Nigel Cross, "Designerly Ways of Knowing: Design Discipline versus Design Science," *Design Issues* 17, no. 3 (2001): 49–55, DOI: https://doi.org/10.1162/074793601750357196.

10 Norbert F. M. Roozenburg and Johannes Eekels, *Product Design: Fundamentals and Methods* (Chichester: John Wiley & Sons Inc., 1995), 72.

11 For an overview, see Kees Dorst, *Frame Innovation: Create New Thinking by Design* (Cambridge, MA: MIT Press, 2015), 45; and Kees Dorst, *Notes on Design* (Amsterdam: BIS publishers, 2017), 13.

The challenge lies in figuring out what new elements to create, even though there is no known (or chosen) how that will lead to the desired outcome. As they are dependent on one another, the what and the how have to be developed more or less simultaneously. This double creative step requires designers to devise proposals for both the what and the how and test them in conjunction. The only way to approach this open problem situation is to work backwards (from right to left in the equation): starting from the only known in the equation, the desired value, and then adopting or proposing a new how. The act of proposing a new how is called *framing*. Thus in design reasoning, we experimentally frame and reframe until we find a way into the problem area. This should raise a warning flag – design abduction means contending with TWO unknowns. This causes designers to bump up against the limits of human cognition, potentially leading to information overload. Cognitive research has shown that we humans can only hold a limited amount of information in our heads at any given moment, and the limit has famously been set at "seven plus or minus two chunks."[12] This has been of concern to design researchers for a long time, and has led to our considering design problems as ill-structured,[13] or even wicked.[14]

The good news is that in design abduction, we don't have to get it right in one shot: design abduction takes place over a longer, iterative creative process. The act of framing the problem and solution involves a sequence of creative (propositional), deductive, critical steps. In this process, the problem and solution co-evolve[15] until a "fit" between the two is found. The nature of the outcome – the value to be achieved – can also shift, depending on that fit. This is an exciting and playful process: the art of designing lies in the skillful juggling of problem frames, design principles, and solution ideas until they all fit together snugly. At the same time, this is a difficult practice: in design abduction, the complexities of problem space, framing, and solution are combined, which means designers may simply have too many balls in the air. They are continuously in peril of losing focus and an overarching perspective, because they often exceed the magic seven-plus-or-minus-two boundary of their all-too-human cognitive abilities.

What are the practices designers have developed to deal with complexity-spawned information overload?

Designers' Strategies for Dealing with Complexity

Complexity is such a pervasive issue in design that designers have developed a plethora of clever and pragmatic strategies, methods, tools, and elaborate heuristics for information management, all of which help to limit the burden on short-term memory, for instance through the clever use of external representations such as sketches, models, and so on. Although these strategies merit research in their own right, in this article I am interested more fundamentally in design as a reasoning pattern, and in the way designers' reasoning is influenced by the need to cope with the stresses of complexity.

These reasoning strategies can be classed according to the element of the design situation they address. A design situation contains (1) a *designer* – person, team or organization – as the actor; (2) a *design problem* and co-evolving design proposition; (3) a *design context*; and (4) a dynamic *design process*.[16] Each of these contains elements and variables that can be manipulated to find ways around the complexity of the design situation. Here we name just a few.

- The reasoning of the **actor** (person or team) is limited by certain cognitive boundaries. But the elements of thinking that are mentioned in the ominous cognitive limit of seven-plus-or-minus-two are not simple bytes, but chunks.[17] These units of knowledge can be very complex in their own

12 George A. Miller, "The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information," *Psychological Review* 63, no. 2 (1956): 81, DOI: https://psycnet.apa.org/doi/10.1037/h0043158.

13 Herbert A. Simon, "The Structure of Ill Structured Problems," *Artificial Intelligence* 4, no. 3–4 (1973): 181–201, DOI: https://doi.org/10.1016/0004-3702(73)90011-8.

14 Horst W. J. Rittel and Melvin M. Webber, "Dilemmas in a General Theory of Planning," *Policy Sciences* 4, no. 2 (1973): 155–69, DOI: https://doi.org/10.1007/BF01405730. In a way, this is a misnomer: the wickedness of the problem is relative to the capabilities problem solver(s) and the reasoning patterns at their disposal.

15 Mary Lou Maher and Josiah Poon, "Modeling Design Exploration as Co-evolution," *Computer-Aided Civil and Infrastructure Engineering* 11, no. 3 (1996): 195–209, DOI: https://doi.org/10.1111/j.1467-8667.1996.tb00323.x; Kees Dorst and Nigel Cross, "Creativity in the Design Process: Co-evolution of Problem-Solution," *Design Studies* 22, no. 5 (2001): 425–37, DOI: https://doi.org/10.1016/S0142-694X(01)00009-6.

16 Kees Dorst, *Describing Design: A Comparison of Paradigms* (Delft: Technische Universiteit Delft, 1997), 47, 70.

17 Miller, "The Magical Number Seven," 81; William G. Chase and Herbert A. Simon, "Perception in Chess," *Cognitive Psychology* 4, no. 1 (1973): 56, DOI: https://doi.org/10.1016/0010-0285(73)90004-2.

right – indeed, an important part of the development of expertise is creation of more complex and sophisticated chunks.[18] This is precisely what gives experts an advantage over novices, and makes expert design processes so very different from those of novices. An increase in sophistication and complexity in the chunks happens more or less naturally as one builds up experience, but it can also be triggered deliberately and strategically.

- Design is often a **team** effort, so there can be more than one actor working in unison. This probably doesn't translate into a linear increase in information processing capacity. A certain level of overlap is required to make sure the actors within the team have a common ground – a shared understanding[19] – but in principle at least, the parallel processing capacity of those brains could grow the team's collective cognitive design capacity. In really complex situations, adopting a co-design approach can be helpful by having relevant aspects of the problem situation represented by people in the design team. The downside of this approach might be that the complexity of the problem situation is directly repeated in the design team, paradoxes and all.
- Complexity is often seen as a property of the world outside us. But there is another, inward complexity that is equally hard to deal with. Our **inner contradictions** hold us to ransom by creating thought patterns that go around in circles, and keep us from progressing. During a series of interviews with design experts, some described their professional development not so much as progress towards higher and higher levels of sophistication, but as "becoming more themselves," a shedding of initial inner conflict to arrive at a pure and simple core.[20]
- Although some theorists like to stress the uniqueness of design situations[21] design practitioners know that they come in **types**. Understanding the types of design situations is an important part of design expertise. Recognizing the pattern in a design situation helps pre-structure it, affording an initial strategy to approach the problem situation. There are always differences in the details, but this means that at least there is a gambit the designer can use to make his or her first move within the complex problem arena.[22] Care should be taken to treat this initial foray into the problem space with some lightness, and not fixate on it too much – earlier research has shown that levity at this juncture is hard, and designers often tend to try and make this primary generator work at all costs.[23]
- A designer should have a broad understanding of **precedents**: earlier approaches and designs that might be applicable to the current design challenge. Again, having such a treasury of design frames and design solutions is often associated with expertise built up over many years of practice, but which can also be constructed deliberately. Design agencies tend to do this by keeping some of the more interesting projects – the ones they identify with, or still want to think about – close at hand, for re-use. The pictures on the walls of a design studio refer to these projects. They are not there for decorative purposes, but as the result of deliberate, strategic decisions about which projects to keep in peripheral view.[24] A design studio is a library of frames and solution ideas.
- A **layering** of design problems and solutions is used in complex design fields like software engineering (architecture) and urban planning, where the designer shifts perspective from the large scale (airplane view), to helicopter-view, to birds-eye view and eventually to the eye level of the person on the street.[25] By taking on these different layers of scale as a series of design challenges, one by one, the overall cognitive load of design abduction is eased.[26]

18 Bryan Lawson and Kees Dorst, *Design Expertise* (Abingdon: Architectural Press, 2013), 172, DOI: https://doi.org/10.4324/9781315072043.

19 Rianne Valkenburg and Kees Dorst, "The Reflective Practice of Design Teams," *Design Studies* 19, no. 3 (1998): 249–71, DOI: https://doi.org/10.1016/S0142-694X(98)00011-8.

20 Wim Groeneboom, quoted in Lawson and Dorst, *Design Expertise*, 33.

21 Donald A. Schön, *The Reflective Practitioner: How Professionals Think in Action* (1992; Abingdon: Routledge, 2017), 41, https://doi.org/10.4324/9781315237473; Donald A. Schön, *Educating the Reflective Practitioner* (San Francisco: Jossey-Bass, 1987), 5.

22 Lawson and Dorst, *Design Expertise*, 39.

23 Jane Darke, "The Primary Generator and the Design Process," *Design Studies* 1, no. 1 (1979): 36–44, DOI: https://doi.org/10.1016/0142-694X(79)90027-9.

24 Ken Yeang, quoted in Lawson and Dorst, *Design Expertise*, 63.

25 Jan Gehl, *Life between Buildings: Using Public Space*, trans. Jo Koch (Washington, DC: Island Press, 2011).

26 Bryan Lawson, *How Designers Think: The Design Process Demystified*, 4th ed. (London: Routledge, 2006), 135, DOI: https://doi.org/10.4324/9780080454979; Frederick P. Brooks Jr., *The Design of Design: Essays from a Computer Scientist* (Boston: Pearson Education, 2010), 133.

- One can also **explore the problem space** through deliberate/systematic research, using systemic design methods and tools like synthesis maps.[27] Because the very creation of a representation/description already entails a level of selection and framing, the assumptions behind these mappings should be questioned regularly. Early adoption of a representation could introduce a specific framework (terminology) that unduly limits the design space.
- In an effort to get a measure of control over the messiness of design processes, design practitioners and theorists alike have proposed sophisticated ways to **cut up the complex design process** into simpler steps. This has resulted in phase models of designing, the mainstay of classic design methodology. In many design schools, phase models have become the backbone of design education, and in large organizations they have led to sophisticated stage-gate models to manage design projects.[28] In this rational problem solving approach to designing, design abduction is modeled as a creative search process going from an initial problem to a solution through a series of divergent and convergent phases, often symbolized in the shape of a double diamond.[29] An alternative way of understanding design is to model it as a learning process: *name – frame – move – evaluate*,[30] which is a reflective practice. It should be noted that in this constructionist theory of professional practice, design progresses through a series of explorations rather than through a sequence of divergent and convergent phases. The evaluation step focuses on the design actions – "Is this action leading in a fruitful direction?" – rather than on the emerging design solution.

All of these strategies have been described in design research, and all can be traced back to expert design practices. They are based on various ways of cutting up complexity, and overcoming the cognitive limitations of the designer by (temporary) simplification, effectively reducing of the number of items under consideration at any one time. Crucially, each strategy – in its own, very different way – seeks to keep design abduction alive in a complex design process. The natural human tendency to reduce uncertainty, tension and complexity by jumping to conclusions all too easily makes us move away from the openness of design abduction to safer, result-focused reasoning. We are never more than one step away from design fixation.[31]

Discussion: Design beyond Problem Solving

Could we be missing the point here? As we saw in Section 1, the practices and strategic fixes I describe in this article have grown and developed over time, as design has evolved and branched out in response to problems that have become increasingly complicated. But maybe we are now at a point where, in the face of true complexity, this evolutionary approach to developing new branches on the tree of design may not be enough.

When problems move from being very complicated to truly complex, our ways addressing them ought to shift radically.[32] If design is entering a time of true complexity, we have to radically shift our thinking and move away from design paradigms based on problem solving[33] to create a new paradigm based on complexity theory and systems thinking.[34] These disciplines demonstrate that in really complex systems, *newness* comes from the emergence of order, rather than goal-directed creation; *change* is achieved through influencing the system, rather than implementation of a plan to solve the problem; and new *state* of relative stability can be achieved by creating resilience, rather than striving for an immutable

27 Peter Jones and Jeremy Bowes, "Rendering Systems Visible for Design: Synthesis Maps as Constructivist Design Narratives," *She Ji: The Journal of Design, Economics, and Innovation* 3, no. 3 (2017): 229–48, DOI: https://doi.org/10.1016/j.sheji.2017.12.001.

28 Annemiek van Boeijen et al., eds., *Delft Design Guide: Design Strategies and Methods* (Delft: Technische Universiteit Delft, 2014), 21; Steven Kyffin and Paul Gardien, "Navigating the Innovation Matrix: An Approach to Design-Led Innovation," *International Journal of Design* 3, no. 1 (2009): 57–69, available at http://ijdesign.org/index.php/IJDesign/article/view/305; Paul Gardien et al., "Changing Your Hammer: The Implications of Paradigmatic Innovation for Design Practice," *International Journal of Design* 8, no. 2 (2014):119–39, available at http://ijdesign.org/index.php/IJDesign/article/view/1315.

29 Kees Dorst, "On the Problem of Design Problems—Problem Solving and Design Expertise," *Journal of Design Research* 4, no. 2 (2004): 185–96, DOI: https://doi.org/10.1504/JDR.2004.009841.

30 Dorst, *Describing Design*, 75.

31 Gabriela Goldschmidt, "Avoiding Design Fixation: Transformation and Abstraction in Mapping from Source to Target," *The Journal of Creative Behavior* 45, no. 2 (2011): 92–100, DOI: https://doi.org/10.1002/j.2162-6057.2011.tb01088.x.

32 David J. Snowden and Mary E. Boone, "A Leader's Framework for Decision Making," *Harvard Business Review* 85, no. 11 (2007): 68, available at https://hbr.org/2007/11/a-leaders-framework-for-decision-making.

33 Armand Hatchuel, "Towards Design Theory and Expandable Rationality: The Unfinished Program of Herbert Simon," *Journal of Management and Governance* 5, no. 3–4 (2001): 260–73, DOI: https://doi.org/10.1023/A:1014044305704.

34 Philip Ball, *Why Society Is a Complex Matter: Meeting Twenty-First Century Challenges with a New Kind of Science* (Heidelberg: Springer Science & Business Media, 2012).

structure – that so-called solution. In a complex problem situation, any attempt to search for "the" solution would be riddled with assumptions. In a truly complex situation, there IS no solution – the way to achieve progress is to create high-quality *interventions* to bring the whole system forward into a more desired state.[35]

So, what ARE the key issues confronting a design professional dealing with a complex, networked situation? First of all, the starting point is difficult to discern – in other words, it is difficult to interpret the problem situation. Secondly, precisely which relationships in the tangle of a complex system are going to be important in shaping what would be the appropriate way forward is quite unclear. To tackle these two issues the designer can adopt a propositional approach both at the stage of interpretation (of that first understanding) and during the action/intervention stage, to create feedback that will demonstrate which relationships in the complex problem situation are key, and which can safely be ignored (for the moment). While the interpretation step could possibly be carried out using inductive reasoning, the intervention step requires the open reasoning of design abduction. This requires the ability to (repeatedly) frame the complex problem situation, propose possible solutions (moves/gambits) and reflect on the efficacy of both of these. Please note that this is leads the designer in the direction of an explorative, reflective, practice approach to designing. The prerequisites for using a rational problem solving approach to designing – first establish the goal, map problem and solution spaces, optimize the search path, create a solution, and so on – are not met in truly complex design situations. This means that designers should move away from a problem-solving approach to design, and embrace the complex nature of the design situation as the starting point for shaping new, much more exploratory design processes.

Conclusion: Towards a New Design Paradigm?

In this article, I set out to trace how design fares at higher levels of complexity, and whether designers need a fundamental shift/a new design paradigm to meet the complex challenges of the future. This question was sparked by the observation that design has trouble dealing with very complex problem situations, despite the strategies and inventive workarounds that have been developed over the years. These strategies do help designers individually and collectively manage the cognitive load on the designer/design team, but dealing with all the information contained in the complex design situation remains a stretch. Complexity theory inspires us to think that in situations of true complexity, the challenge is to intervene in a way that makes the whole system move to a more desired state. This potentially upends our view of what designing is, beyond the notion of a problem, or a solution that is the outcome of a project. If we think design can rise to this challenge, what new forms of design would we need to develop? Where can we find these new practices? Are new, paradigmatic examples emerging?

If we look to state of the art design practices, those at the cutting edge of complexity are to be found in social design projects of design agencies[36] and (semi-governmental) design labs.[37] One such leading innovative design consultancy in this field is Reframing Studio in Amsterdam.[38] In 2015 they embarked on a program called "Redesigning Psychiatry" – a complete reimagining of the Dutch mental health service to be fit for purpose by 2030.

The Dutch mental health care system serves about a million citizens per year. The society in which the system operates is changing rapidly, and many mental health care organizations are struggling as they face economic and demographic challenges. At the same time, there is a sense that there is room for improvement in the mental health care system, for example by taking advantage of new

35 See the notion of "transformative teleology" in *Complexity and Management: Fad or Radical Challenge to Systems Thinking?*, ed. Ralph D. Stacey, Douglas Griffin, and Patricia Shaw (London: Routledge, 2000), 52–54.

36 For example, see Megan Anderson et al., *Pioneers: Thoughts on Global Design Research* (London: STBY, 2017).

37 Mieke van der Bijl-Brouwer, "The Power of Trust and Motivation in a Designing Social System" (working paper, RSD6 Relating Systems Thinking and Design 2017, Oslo School of Architecture and Design, Oslo), available at https://systemic-design.net/rsd6/systemic-design-theory-and-methods/#brouwer.

38 For more information see https://www.reframingstudio.com.

technologies to offer smarter care solutions. But innovation still struggles to get beyond a translation of existing practices into digital applications.

Redesigning Psychiatry is a collaboration bringing together 10 innovative mental health care organizations, universities, and government bodies. The wide ranging program combines interview and desktop research with systems thinking, reflective design practices, intense stakeholder collaboration, and the testing of new solutions. Design questions around the desired interaction between the distressed individual and the future mental health care system are the central driver for thinking through a much broader systems-level change. During the first phase, the consortium of collaborators developed a shared vision of the future system and its core characteristics. Interestingly, the first phase also encompassed a separate project to design a normative framework for the development of the health care system. After all, the project is not aimed at designing improvements of the existing system, it seeks to create a new system that will be fit-for-purpose in 2030, so everyone needed to envisage what the values and needs of that society would be. In the second phase, proposals for innovations (IT solutions, clinical interaction types, and policy advice) were developed. Then a roadmap was devised that laid out the route toward *effecting the desired changes*. Additional symposia and workshops involved a wider group of stakeholders beyond the consortium.

Some key features of the Redesigning Psychiatry program are

1. It is a design-driven program of activities, rather than a design project;
2. It is a multi-year approach, comprised of sub-projects in which multiple stakeholders have roles that vary over time;
3. It concentrates on exploration and problem setting, rather than problem solving;
4. There is a layered approach to the program and the values that are to be achieved, the principles and approaches to achieving these values, the method(s) and tools associated with these approaches, and the concrete actions taken;[39]
5. Across each of the sub-projects, design abduction is used to keep the problem space and solution space open, and avoid jumping to conclusions;
6. The approach overall is a highly iterative framing and reframing of the issues until a dominant direction emerges; and
7. The designers seek to respect, conserve, and activate the partner organizations' existing pool of expertise. This is an open, sophisticated approach that is a far cry from the naïve social design projects mentioned early on in this paper.

Returning to the three questions posed in the introduction, I can now say that design reasoning can deal with complexity if designers move away from conventional problem-solving approaches to design. The strategies outlined in Section 3 are all useful, but simply extending them doesn't tackle the fundamental issues with adopting a problem solving approach. True complexity requires a considerable shift in our approach to designing, away from the problem solving model of design to one that is based on complexity thinking. Does this then amount to a new design paradigm? The answer, in the end, depends on our chosen definition of a *paradigmatic shift*. While moving away from seeing design as a kind of problem solving – and giving up on the idea of a definable design problem, solution, and project – is a massive shift, yet the ensuing practice and its outcome are not completely strange to design reasoning, either. In a way, this is a form of design neoteny,[40] in the sense that the result of the design activity looks more like an ongoing design process. The outcome of design becomes a very flexible system with a built in, transformative teleology[41] that keeps redesigning itself as

39 Manfred A. Max-Neef, "Foundations of Transdisciplinarity," *Ecological Economics* 53, no. 1 (2005): 5–16, DOI: https://doi.org/10.1016/j.ecolecon.2005.01.014; Dorst, *Notes on Design*; Paul Hekkert and Matthijs van Dijk, *ViP—Vision in Design: A Guidebook for Innovators* (Amsterdam: BIS publishers, 2011).

40 Neoteny, a term from evolutionary biology, is a species' retention of its juvenile features into adulthood. *Homo sapiens* are a prime example of this, because we still look like young apes—we have high foreheads, large brains, relatively short limbs, and little body hair. Stephen J. Gould, "Change in Developmental Timing as a Mechanism of Macroevolution," in *Evolution and Development*, ed. J.T. Bonner (Berlin, Heidelberg: Springer, 1982), 333–46; also see Stephen Jay Gould, *The Mismeasure of Man* (New York: WW Norton & Company, 1996).

41 Stacey, Griffin, and Shaw, *Complexity and Management*.

time goes by and circumstances change. Resilience and adaptability are key. In the Redesigning Psychiatry program, the original ideas and vision for 2030 don't have to be "right," as long as they can be adapted over time[42] in a continuing dialogue or dialectic process.[43] Such systems, primed as they are for ongoing transformation and inclusive of other professionals' expertise, become a basis for transdisciplinary innovation.[44]

Then design moves beyond problem solving toward being the solution in itself.

42 Sam Bucolo, *Are We There Yet?: Insights on How to Lead by Design* (Amsterdam: BIS Publishers, 2015).

43 Richard Buchanan, "Surroundings and Environments in Fourth Order Design," *Design Issues* 35, no. 1 (2019): 4–22, DOI: https://doi.org/10.1162/desi_a_00517.

44 Kees Dorst, "Mixing Practices to Create Transdisciplinary Innovation: A Design-Based Approach," *Technology Innovation Management Review* 8, no. 8 (2018): 60–65, DOI: https://doi.org/10.22215/timreview/1179.

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