

Design Thinking and Healthcare Innovation: Notes for Researchers and Practitioners

Barry M. Katz

California College of the Arts, 1111 8th Street, San Francisco, CA, 94107, United States of America
Corresponding author: bkatz@cca.edu

BRINGING DESIGN TO HEALTHCARE: METHODOLOGICAL NOTES

In one of his more beguiling statements, Charles Eames explained to an interviewer that “Design is a method of action.” What is left unsaid, however, is how a “method” is to be translated into a “methodology,” a structured set of practices that can be applied in diverse contexts. The following notes outline a set of methodological principles that may be of value to researchers and practitioners specifically interested in approaching healthcare improvement projects.

DESIGN METHODS AND HEALTHCARE INNOVATION

In his Compton Lectures of 1968, Herbert Simon famously proposed that “Everyone designs who devises courses of action aimed at changing existing situations into preferred ones” (Simon, 1969). This provocation would fuel a fundamental reconceptualization that is ongoing: a practice once charged with giving form to objects has been reframed as the application of transformative strategies to a vastly greater range of problems, engaging a far greater population of practitioners.

This trajectory has been ably explored by numerous scholars (Buchanan, 1992; Cross, 2023; Auernhammer, 2024). Today, often under the umbrella of “design thinking,” attempts are being made to apply the methods of designers in fields as diverse as military strategy, corporate organization, disaster relief, and social policy. Inevitably, this has generated a sprawling polemic ranging from the dismissive (Jen, 2017) to the incredulous (Norman, 2010). Defenders have been no less aggressive in promoting “Design Thinking” through a seemingly endless stream of lectures, workshops, certificates, executive training programs, and even a “3-hour Design Thinking Starter Kit” (IDEO, 2011; Stanford, n.d.).

In contrast to the all-or-nothing, take-it-or-leave-it framework that has characterized many of these offerings, it may be more productive to view design

thinking not as a fixed methodology but as a toolkit whose contents have evolved over the course of a century of design practice. This more nuanced, less formulaic approach can be seen in recent attempts to adapt these tools selectively to the complex world of healthcare. Leading institutions including Stanford Medicine, the Mayo Clinic, Kaiser Permanente, Sutter Health, and the Robert Wood Johnson Foundation have committed significant resources to improvement projects grounded in design concepts (Jones, 2013; Mawer, et al., 2019; Ku, 2020). In the high-stakes world of healthcare there is little tolerance for what more than one critic has uncharitably called “Design theater” (Blank, 2019).

DESIGN *FOR* > DESIGN *WITH* > DESIGN *BY*

To be sure, design professionals have long been active in the healthcare field where they have worked to improve the ergonomics of surgical instruments, the legibility of pharmaceutical packaging, the spatial architecture of hospital interiors, and services ranging from admission procedures to enrollment in managed care programs. Over time these engagements have evolved from the classic expert-client model to a collaborative one in which laboratory managers, research scientists, and clinical staff work alongside design consultants throughout the life of a project. The next frontier will be to make their methods accessible to healthcare professionals themselves, no longer just as clients or partners but as agents of transformation.

What is the method and what is it useful for?

As a *complement* to the data-driven, evidence-based practices that have defined modern medicine for more than a century, the methodological framework outlined here draws upon qualitative as well as quantitative data and gives equal weight to subjective experience and objective behavior. As an *alternative* to the type of top-down decision analysis common to hierarchical organizations, it typically begins at the level of individuals and works outward through the entire chain of stakeholders, while seeking to understand the relationships among them. In situations where the



problem may not be clearly defined—the famous “fuzzy front-end”—the designer’s empathetic approach can help to explore the problem space, discover idiosyncratic factors that may be resistant to purely numerical evaluation, and point to multiple avenues for addressing them.

How can it be applied?

A recent project by an interdisciplinary team of design professionals—a biomedical and a mechanical engineer, a medical anthropologist, a human factors researcher, and a change management expert with deep experience in digital health—has taken on this challenge. Inspired by, *inter alia*, IDEO’s approach to systems-oriented, human-centered design (IDEO, 2011), they have undertaken to put the methods of the designer into the hands of healthcare teams preparing to initiate improvement projects within their own medical environments (Katz, *et al.*, 2025).

On the basis of these findings, we describe here a set of process-oriented and practice-based guidelines specifically adapted to the complex realities of healthcare institutions. Whereas prevailing approaches to design thinking often work from a universal template that purports to be applicable across all industries, the challenging environments of clinics, hospitals, medical schools, and public health agencies demand methods marked by fluidity, flexibility, and a sober recognition that decisions may—literally—have life-or-death consequences. The following section outlines a methodology that is both structured and adaptable to the unique realities of healthcare.

Phase 1. EXPLORE the data



To be meaningful, an improvement project must be big enough to matter; to be manageable, it must have boundaries and limits: Is the project about improving an existing practice or creating a new one? Does it address an immediate shortcoming or anticipate the future? Is it localized, or does it cross into adjacent departments, units, or divisions? Defining the nature and scope of a transformation initiative is critical to its success.

A first step in making this determination is the collection and analysis of data: incident reports, electronic medical records, insurance claims, hiring and turnover records are among myriad sources—anonimized as required—that can point to unmet needs and unresolved issues. Once the data have been scrutinized, the team can begin to estimate the costs and benefits of a project, identify the resources it will require, and formulate a plan of action.

Phase 2. PLAN the project



A dedicated core team will be essential in any improvement initiative, but to be effective the team must operate not as a link in a chain but as the hub of a wheel whose spokes include sponsors, partners, decision-makers, and the frontline staff who will execute the project—in other words, the full range of stakeholders. A key function of the core team—alongside such mundane details as creating a project timeline and securing space—will be to coordinate these interdependent resources.

It is inevitable, in the complex world of healthcare, that unexpected obstacles and opportunities will arise: key partners may retire, be reassigned, or simply withdraw; a sudden economic downturn may result in a reallocation of resources; a disruptive technology acquisition could solve one set of problems while creating others; a global pandemic or a localized environmental disaster could without warning upend every aspect of business as usual. Medical environments are especially prone to the spontaneous, the contingent, and the unpredictable, but as Louis Pasteur reminded young scientists, “Chance favors the prepared mind.”

Phase 3. RESEARCH the problem space



The discovery phase of an improvement project is an intensive endeavor that involves ferreting out hard data, becoming familiar with regulatory guidelines, and reviewing the relevant secondary literature. It may also entail venturing into the murkier world of subjective needs, fears, and desires—precisely the area where design research excels. The task here is to capture the stories behind the numbers, to enrich published reports with direct experience, and to uncover hidden meanings that may point to promising opportunities.

What we have called the “designer’s toolkit” is well-equipped with methods intended to facilitate this type of discovery, the most common of which are on-site observations and in-context interviews with individuals representing designated behavioural segments. The latter will include people directly involved in patient care, but valuable insights can also be gained by probing

the margins: a receptionist, janitor, ambulance driver, cafeteria worker, or security guard may be uniquely positioned to contribute perspectives that would not otherwise be obvious.

Phase 4. DEFINE opportunities



A transformation team that has amassed a body of statistical data, interview transcripts, and photographs must now begin the work of making sense of it all: What patterns emerge? Where are the gaps? What anomalies need to be explained? Does a person's workspace contain silent clues as to his or her values, motivations, or frustrations? The objective here is not to pass judgment, but to extract insights that may point to hidden opportunities.

The output of the synthesis phase will be a clear statement of the problem to be solved, based on the needs that have been discovered and the opportunities they suggest. It may be productive to formulate this statement as a design challenge: How might we... reduce the incidence of medication errors in the ICU? How might we... prevent assaults on nursing staff in the psychiatric ward? How might we... mitigate tensions between community clinic volunteers and local law enforcement? The proper formulation of the problem to be solved is critical to the success of its solution.

Phase 5. GENERATE new ideas



If the output of the synthesis process is a question, the goal of the generative phase is an answer—or to be more precise, a multitude of answers. Design teams rarely fixate upon a single solution, but engage in a protracted play of ideas that may venture into the impractical, the fanciful, and perhaps the outrageous:

“What if we had a budget of \$10 million? What if we had no budget at all?”

“What if we could take over an entire building? What if we were allowed only one room?”

“How would Cirque de Soleil do it? The Navy SEALs? The Spanish National Soccer Team?”

The designer's toolkit includes an ever-evolving body of techniques intended to stimulate ideation and help teams penetrate superficial appearances and loosen the hold of their own mental models.

Out of this tangle of ideas, quotes, photographs, and observations, a team will be ready to generate a set of “design principles,” conceptual guidelines that express the core values against which alternate proposals can be measured and evaluated. Examples of design principles, drawn from a project at Reykjavik's Landspítali University Hospital to improve the experience of patients undergoing kidney dialysis, included:

“Lessen the pain of waiting.”

“Optimize giving patients information.”

“Conserve patients' limited energy.”

Again, these are not solutions, but criteria to apply to whatever solutions the team may generate. (Katz, *et al.*, 2025).

Phase 6. SELECT promising ideas to test



Prototyping allows a team to test an array of possible ideas at minimal cost, and, on the basis of feedback received, determine which of them may be worth pursuing before investing further time, energy, and resources. As such, it is a powerful risk mitigation strategy.

Designers have learned that it is possible to prototype a precision surgical instrument with pipe cleaners and paper clips, a waiting room with cardboard and masking tape, nursing station routines with a few “actors” recruited from a nearby office, the experience of a patient in distress awaiting triage. (Dubberly, *et al.*, 2010). As the core concept becomes progressively more refined, so will the prototype.

Phase 7. PILOT prototypes in real-world settings



Whereas a prototype is, by definition, a rough approximation of a concept, a pilot is a transformation team's first effort to build it, modify it, and deploy it in a real-world institutional setting. A successful pilot will indicate whether a proposal addresses a real need, can be safely implemented within the structures, processes, and resources of the organization, and is likely to generate sustained value over time. A pilot, in contrast to the many prototypes that will have preceded it, exposes a proposed innovation to a larger population

where errors, omissions, and oversights can be identified and corrected.

Like every other part of the design cycle, the piloting stage is a learning stage. In healthcare institutions, where inherited practices, jurisdictional rivalries, and professional hierarchies may be the rule, it is crucially important to gather feedback and gather support: from C-level executives who will need to authorize a final idea; from compliance officers who will need to ensure that it meets regulatory requirements; from frontline providers who will need to feel that it simplifies their workflows and improves their lives. And here, as in every other phase of the design cycle, it is all too easy to overlook what product designers have awkwardly called the “end user”—in this case, the patient.

Phase 8. VALIDATE and launch



An improvement project of the sort outlined here will consume the time, resources, and goodwill of many people, but the payoff will be—obviously—in seeing it deployed in a way that improves the lives of patients, caregivers, and the institutions within which they work. If it is successful, it may be emulated by other units. In time, it may be adapted by other organizations and to the healthcare system at large. Accordingly, not just the outcomes but the learnings from such an initiative should be communicated throughout one’s own institution and beyond.

CONCLUSION

It is our hope that these methodological notes—derived from theoretical research and professional practice—will perform two parallel services: First is to remind the design community of the potentials for enhanced engagement with healthcare professionals, not just as clients but as collaborators. There is a long and well-documented history of co-design in general, but less attention has been directed to the field of healthcare in particular. Second is to engage healthcare professionals themselves: By presenting the outlines of a rigorous but flexible methodology we hope they will find a powerful set of tools that may help them to effect meaningful changes in their own environments and ultimately to deliver better outcomes to the patients they have committed themselves to serving.

ACKNOWLEDGEMENTS

Illustrations are drawn from Simon Mawer, *et al.*, (2019), *Discovery Design: Design Thinking for Healthcare Improvement*. The Risk Authority, Stanford Medicine.

CONFLICTS OF INTEREST

None to declare.

REFERENCES

- Auernhammer, J. M. (2024). Advancing Design through Science and Research, *CERN IdeaSquare Journal of Experimental Innovation*, 2024; 8 (2): 4-10. <https://doi.org/10.23726/cij.2024.1510>
- Blank, S. (2019). *Why Companies do Innovation theater instead of Actual Innovation?* Harvard Business Review, October 2019. <https://hbr.org/2019/10/why-companies-do-innovation-theater-instead-of-actual-innovation>
- Brown, T. (2009/2019). *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation*. Harper Collins.
- Buchanan, R. (1992). Wicked problems in design thinking. *Design Issues* 6, pp. 5-21. <https://doi.org/10.2307/1511637>
- Cross, N. (1993). *A History of Design Methodology*. https://monoskop.org/images/6/66/Cross_Nigel_1993_A_History_of_Design_Methodology.pdf
- Cross, N. (2023) *Design Thinking: Understanding How Designers Think and Work*. Bloomsbury Publishing, London.
- Dubberly, H., Mehta, R., Evenson, S., & Pangaro, P. (2010). Reframing health to embrace design of our own well-being. *Interactions* 17, pp. 56-73. <https://doi.org/10.1145/1744161.1744175>
- IDEO (2011). *Human Centered Design Toolkit*, 2nd edition.
- Jen N. (2017). Design Thinking is Bullshit. <https://www.youtube.com/watch?v=V8gjDsW3lsY>
- Jones, P. (2013). *Design for Care: Innovating Healthcare Experience*. Rosenfeld.
- Katz, B., Mawer, S., et al. (2025). *Healthcare by Design: A Handbook for Changemakers*. University of Toronto.
- Ku, B. & Lupton, E. (2020), *Health Design Thinking: Creating Products and Services for Better Health*. Smithsonian.
- Martin, R. (2007). *The Opposable Mind: How Successful Leaders Win through Integrative Thinking*. Harvard Business School.
- Mawer, S., et al. (2019). *Discovery Design: Design Thinking for Healthcare Improvement*. The Risk Authority, Stanford Medicine.
- Norman, D., Design Thinking: A Useful Myth (2010). Core77: <https://www.core77.com/posts/16790/design-thinking-a-useful-myth-16790> . Norman subsequently revised this assessment: <https://jnd.org/rethinking-design-thinking/>
- Rittel, H. & Webber, M. (1973). Dilemmas in a general theory of planning. *Policy Sciences*, 4 (2), 155-169. <https://doi.org/10.1007/BF01405730>

Simon, H. (1969). *The Sciences of the Artificial*. MIT Press.
Stanford d.School: [https://dschool.stanford.edu/tools/starter-
kit](https://dschool.stanford.edu/tools/starter-kit)