The Leading Edge

A design thinking framework for healthcare management and innovation

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ABSTRACT

The business community has learned the value of design thinking as a way to innovate in addressing people's needs – and health systems could benefit enormously from doing the same. This paper lays out how design thinking applies to healthcare challenges and how systems might utilize this proven and accessible problem-solving process. We show how design thinking can foster new approaches to complex and persistent healthcare problems through human-centered research, collective and diverse teamwork and rapid prototyping. We introduce the core elements of design thinking for a healthcare audience and show how it can supplement current healthcare management, innovation and practice.

1. Introduction

Health systems in the U.S. have proven quite effective at doing what they were designed to do; treat illness and manage chronic disease for those with access to it. However, the current practice is not sufficient to address many complex health challenges, including growing rates of obesity and diabetes, health and economic disparities and cost control. A call for change has come not only from politicians and news pundits, but also from those delivering and receiving healthcare's services. Physicians face one of the highest burnout rates of any profession in the United States[1] and a recent Commonwealth Fund survey found that "more than seven out of 10 adults believe the U.S. health system needs fundamental change or complete rebuilding."[2]

With unprecedented and growing financial, social and political pressures, health systems must develop a more robust capacity for better aligning current and future services with where, how, when and with whom health occurs. Successful health systems will have the ability to innovate in delivering services that cut across organizational, political, geographical and sectorial boundaries. While these concepts are not new, robust yet easily accessible practice frameworks for integrating them effectively within health systems' day-to-day operations and culture remain limited. We argue

that design thinking, an innovation framework increasingly utilized within the private sector,[3] has the potential to offer healthcare professionals a well-defined and recognizable practice framework for the broad-scaled integration of more creative, interdisciplinary and human-centered approaches to healthcare management, innovation and practice.

The good news is that healthcare is not alone in facing this challenge of developing broad-based competency and capacity to innovate within complex systems. Highly competitive and rapidly evolving industries, such as consumer electronics, have succeeded in doing so by identifying and understanding customers' latent needs, and challenges as the basis for developing effective and marketable solutions that meet customer expectations. This has become particularly important and difficult in recent years in domains such as mobile technology, where companies can no longer develop products and services in isolation. Instead, as in healthcare or public health advocacy, companies must increasingly integrate disparate technical and programmatic components (e.g. smartphone hardware, online cyber-infrastructure and applications) to deliver seamless, compelling, and effective end-user experiences.

This rapid and accelerating market shift towards integrated products and services has spurred significant changes in how companies invest in innovation, train their employees, and engage with their customers. Among these, one of the most visible and, arguably, successful trends is a broad-based investment in 'design

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thinking'[3] – an applied research and innovation framework that prioritizes *empathy for users* of a service or product, involves highly *diverse and collaborative project teams*, and encourages an *action-oriented rapid prototyping* of user-derived insights rather than top-down hypotheses. In this paper, we consider the potential value that design thinking may offer healthcare management and practice.

2. What is design thinking?

Design thinking is, at its core, a systematic innovation process that prioritizes deep empathy for end-user desires, needs and challenges to fully understand a problem in hopes of developing more comprehensive and effective solutions. Designers begin with research and empathic engagement with the people most affected by and knowledgeable about a product, service or experience that needs changing. After this analytical phase, designers begin a synthesis phase in which they work with a diverse group of participants to devise alternative ways of achieving preferred results. Then they include those participants in a series of critical reviews of the ideas until the best scenarios – the ones that meet the greatest number of needs and can be accomplished within the constraints of budget and schedule – begin to emerge. Finally, the design process enters a rapidly iterative prototyping and testing phase in which multiple ideas get put into action, often at a small scale and in a trial manner, to learn something new about the problem or potential solution. After a series of critical evaluations of these trials, an optimized solution to the situation emerges and is ready for scaled implementation.

This process has many parallels to the ways in which science unfolds yet has some important differences in emphasis. Research into how scientists and designers solve problems has shown that the former put more emphasis on analysis of pre-formed hypotheses or theory-driven solution approaches, while the latter put more emphasis on synthesizing information and ideas from many different sources, in search of new and unconventional solutions.[4] In this way, design thinking can be an important new approach and toolset for complex problems in which existing practice paradigms do not work well, requiring whole new approaches to a problem.

Design thinking also shares numerous tenets with process improvement used extensively within healthcare administration, including a focus on brainstorming, user needs and collaboration.[5] Important differences include the types of problems being addressed, the context of the problems and where along the innovation continuum these innovation approaches are emphasized[5] (see Table 1). For instance, design thinking is most useful early in the innovation process when problems are not well defined, or it has become clear that current attempts to solve a problem are not working. In contrast, process improvement is most valuable when problems and possible solutions are less abstract and more relevant to current day-to-day operations.

3. Developing capacity for design thinking within healthcare administration

Developing solutions to the myriad multi-dimensional challenges facing the health of individuals and communities remains a formidable challenge in healthcare. We argue that design thinking as a core competency within healthcare administration could offer a valuable complement to cornerstone disciplinary skillsets such as strategic planning, operations management, personnel management and process improvement as a way to help navigate and drive innovative solutions to healthcare's 'wicked problems.' Design thinking is not a checklist of protocols, instead it is a translatable practice framework that can be learned and embedded within the DNA of an organization. In this section we detail key design thinking methods for broadly, yet safely embedding change and innovation within healthcare strategy and operations.

The core methods used in design thinking can differ among authors and practitioners,[6] but the methods most widely accepted and applicable to healthcare administration are *the development of empathy*, *radical collaboration* and *rapid prototyping*.

3.1. Developing empathy

The first and most critical design thinking method, empathy, prompts teams to focus on developing a deep and diverse understanding of the explicit and latent needs, desires and values of a particular user group. As a leading design-thinking theorist, Tim Brown observes, "although people often cannot tell us what their needs are, their actual behaviors can provide us with invaluable clues about their range of unmet needs."[7] Because what people say they do can be very different than what they actually do, a great starting point for health systems involves creatively engaging target populations within the context of their daily lives – where and how they live, learn, work and play. In this way, design thinking offers a framework for orienting diverse project teams around problems, as they exist within, and are experienced by individuals and communities, rather than around individual expertise, methodology or organizational structures. In addition to the 'themes' or commonalities among individuals and communities, this approach excels at exposing important 'insights' about what may be unique to a small subset of stakeholders, offering new perspectives into how individuals and communities experience health problems and how to address them in novel ways. Some activities for gaining empathy include:

1. *Contextual observations*: observations that occur in the 'users' environment (the context of their daily lives) allows teams to generate new insights that would otherwise not be accessible in more 'artificial' settings. One example would be to map a day in the life of particular individuals or communities.
2. *Self-documentation*: individuals take pictures, record video or audio, draw, write or utilize various tools such as apps to respond to prompts about their environments and experiences.
3. *Extreme user stories*: capture the challenges and work-arounds of those living outside the normal 'bell curve' because those same populations may address challenges in more creative and

Table 1
Design thinking and process improvement.

Process improvement orientation	Design thinking orientation
Prioritizes evaluation of limited set of possible solutions	Prioritizes comprehensive understanding of underlying problems
Well suited to address problems that have predictable solutions	Well suited to address problems that have unpredictable solutions (wicked problems)
Promotes consensus building (convergent)	Promotes opposing ideas and debate (divergent)
Aims to uncover what is important to consumers within a particular experience	Aims to uncover what is important to consumers in their everyday lives
Empathy research focuses on what people *think* to reveal improved outcomes	Empathy research focuses on what people *feel* to reveal new/disruptive outcomes

efficient ways. Key insights from this can lend direction to the development of generalizable, practical and effective health interventions.

4. *Analogous scenarios*: drawing analogies from other industries can lead to some of the best solutions, and so in the development of alternative scenarios ask: Where, outside of healthcare, do similar challenges exist and how have they been successfully addressed?

3.2. Radical collaboration

The second design thinking method recognizes that no one discipline alone can systematically address complex health issues, precisely because health problems exist across and at the intersections of disciplines and sectors, not within them. While collaboration has been foundational to healthcare administration, teams can default to consensus-building and defensive routines because of the perceived need to determine which argument/concept/hypothesis is 'right' and which ones are 'wrong.' Rather than seeking and understanding opposing mindsets and perspectives, we have developed systems that, as management professor John Sterman notes "often yield group-think, as members of a group mutually reinforce their current beliefs, suppress dissent, and deal themselves off from those with different views or possible disconfirming evidence."[8] This focus on 'choosing' sides early in the problem-solving process often leads to over-simplification of problems, or worse, choosing the wrong problem to solve.

The creative tensions fostered by opposing ideas offer teams an effective approach for navigating complex and dynamic healthcare challenges. As Roger Martin, a leading proponent of design thinking in the business world writes, "instead of choosing one idea at the expense of the other, generate a creative resolution of the tension in the form of a new idea that contains elements of the opposing ideas but is superior to each."[9] One method that has been successful in the private sector for constructively working through these tensions has been to start small and rapidly test ideas and assumptions with user groups. Some activities for guiding radical collaboration include:

1. *Outside-in participation*: help teams get 'un-stuck' by exposing team members to new ideas and experiences. For example, invite someone working in retail, hospitality or banking to join your meetings. Better yet, take a field trip and observe them working in their normal context.
2. *Stop brainstorming (sort of)*: research shows that traditional brainstorming can actually restrict creativity.[10] Instead try more disruptive forms of brainstorming, such as brainswarming which allows for input from a more diverse set of participants and thinking styles.[11]
3. *Introduce constraints*: it might feel a bit counterintuitive to introduce constraints to promote creativity, but infinite opportunity will paralyze even the most creative stakeholders. Test different constraints (including surprising and contradictory ones), and change them if necessary to help team members reframe the problem at hand and think differently about possible solutions.[12] For example, ask 'What would this idea look like if we had to deliver it at 50% cost or without clinics and doctors?'

3.3. Rapid prototyping

Rather than fully deploying a few theory-only ideas, the final design thinking method of testing many rough ideas in rapid iteration, or prototyping, aims to generate and test *multiple* alternative hypotheses and divergent strategies before selecting the best available option(s) for refinement. Making ideas tangible and

real for target communities (as well as project teams) is an effective way to learn something new about an individual or community, the problems they face and the ways in which they might address them. In moving from a traditional 'thinking-to-do' approach to a 'doing-to-think' approach, teams will improve their capacity for uncovering unforeseen challenges and unintended consequences.[7] In fact, Sterman argues that there are no side effects, simply effects to be learned from[8] and doing so early in a project will save considerable time and resources and ensure strategies and interventions that are most responsive to the problems and the communities they affect. The willingness to 'learn as you go' is a consistent and safe recipe for innovating within the private sector and has the potential to offer health systems a similarly reliable and cost-effective way to garner new perspectives and insights about problems and their possible solutions. Some activities for rapid prototyping include:

1. *Identify variables*: instead of prototyping full-scale solutions, start by leveraging existing qualitative and quantitative data sets to help identify particular variables for testing. These small scale prototypes will "help you learn about specific aspects of your solution or mindsets of your users."[13]
2. *Contextual prototyping*: refine your understanding of problems, solutions and 'users' by testing prototypes with 'users' in their daily environment. Do not explain how prototypes are 'supposed' to work, instead allow users to experience a service, space or artifact with little or no direction and observe what happens.
3. *User-driven prototyping*: instead of creating something for 'users' to respond to, engage them in the prototyping process. "Different assumptions and desires are revealed when the user is asked to create aspects of the design, rather than just evaluate or experience a prototype."[13]

4. Conclusion

Much of the skepticism and frustration linked to the scale and pace of change and innovation within the current health system stems not from a lack of vision, effort or even resources; rather it arises from attempts to remake a healthcare model never designed to do the things now being asked of it. We argue that expanded capacity for and application of design thinking approaches within healthcare can help drive necessary innovation in care delivery models. There is no one 'right' or easy answer to the challenges healthcare faces now or in the future, but this design thinking framework offers an accessible and recognizable approach for discovering, developing and delivering services (both old and new) that better align with individual and community needs. This approach will require health systems (1) build capacity for recognizing and articulating explicit and latent stakeholder needs and desires, (2) engage a broader set of voices (especially those outside healthcare) and constructively work with radically different perspectives (tensions) rather than attempting to identify one as 'right' at the expense of others and (3) start small by rapidly testing multiple hypotheses and possible solutions within the communities living with the consequences of persistent health problems and having the most at stake in addressing them. The future of healthcare delivery is likely to look quite different than what the industry has grown accustomed to. The integration of a design thinking framework not only offers health systems a way to respond to certain change, it offers health systems the opportunity to lead it.

References

1. Shanafelt TD, Boone S, Tan L, et al. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Arch Intern Med.* 2012;172(18):1377–1385.
2. Stremikis K, Schoen C, Fryer A.K. A call for change: the 2011 Commonwealth Fund Survey of Public Views of the U.S. Health System. Issue brief. April 2011;6:1–23.
3. Bernstein A. The Evolution of Design Thinking (full issue). Harvard business review. September 2015;93(9).
4. Lawson B. *How Designers Think: The Design Process Demystified.* London: Architectural; 1980.
5. Furr N, Dyer J. Choose the Right Innovation Method at the Right Time. Harvard Business Review December 31, 2014. ⟨https://hbr.org/2014/12/choose-the-right-innovation-method-at-the-right-time⟩; 2015 Accessed 15.09.15.
6. Seidel VP, Fixson SK. Adopting design thinking in novice multidisciplinary teams: the application and limits of design methods and reflexive practices. *J Prod Innov Manag.* 2013;30:19–33.
7. Brown T, Wyatt J. Design thinking for social innovation. *Dev Outreach.* 2010;12(1):29–43.
8. Sterman JD. Learning from evidence in a complex world. *Am J Public Health.* Mar 2006;96(3):505–514.
9. Martin RL. *The Opposable Mind: Winning Through Integrative Thinking.* Boston: Harvard Business Press; 2009.
10. Mullen B, Johnson C, Salas E. Productivity loss in brainstorming groups: a meta-analytic integration. *Basic Appl Soc Psychol.* 1991;12(1):3–23.
11. McCaffrey T. Why You Should Stop Brainstorming. March 25, 2014. ⟨https://hbr.org/2014/03/why-you-should-stop-brainstorming/⟩ Accessed 15.09.15.
12. May ME. How Intelligent Constraints Drive Creativity. January 30, 2013. ⟨https://hbr.org/2013/01/how-intelligent-constraints-dr⟩ Accessed 12.09.15.
13. Stanford University, Hasso Plattner Institute of Design. Bootcamp Bootleg; 2015. ⟨http://dschool.stanford.edu/wp-content/uploads/2013/10/METHODCARDS-v3-slim.pdf⟩ Accessed 10.09.15.

Conflict of interest disclosure statement

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