What is a System and Why Can't you Touch it?

Jamer Hunt  
Director, Graduate Program in Transdisciplinary Design  
Parsons The New School for Design

Can we design for systems? And if so, what changes in the process of design? What follows are reflections on process. In this essay I will explore two steep challenges that arise when designing for socio-technical systems change and then sketch the outlines of “speculative ethnography,” as a possible step forward. Neither challenge is brand new, but each seems to emerge as a result of developing a design practice that is bottom-up, socially engaged, and systems oriented. There are not necessarily easy answers, but perhaps there are some clues that can indicate a path forward.

Background

To explore this I will build upon four years directing a graduate Transdisciplinary Design program at Parsons The New School for Design (and eight years directing a graduate a socially oriented Industrial Design program before that), as well as observations of social design practices from many different institutions and contexts. The Transdisciplinary program, which launched in 2010 and enters a cohort of 20 diverse design students each year, will be my primary source of examples. The program aims to utilize the process of design to address large-scale, complex challenges with a focus on issues of social change and social justice. The launch of the program coincided with a pervasive sense in the US (and elsewhere) that many large-scale systems were in crisis and that our physical and social infrastructure was fraying, whether in the realms of education, finance, healthcare, politics, food, or climate change. The opportunity, as we saw it, was to leverage the power of design to work with underserved communities in atypical contexts to envision systemic change.
Social systems, and the many forms they take, require distinctly different approaches of designers. And while many designers have embraced and embedded practices of social observation into their practices, this is not the same thing as catalyzing social system change. Designing for systems is not the same thing as designing artifacts. It is not simply a matter of a linear increase in scope and scale. It is a qualitatively different act. And when one is designing to catalyze social change through systemic reconfiguration, the problem grows even more complex. The process changes, the content changes, and outcomes change in ways that present unique and vexing challenges for traditionally trained designers.

The first and most evident obstacle to this approach is that designers, historically, have been trained to work at the level of the artifact, not the system. Whether books, garments, buildings, appliances, interfaces, or even landscapes, the purview of design has always been oriented toward solving problems by shaping things. But does this artifactual approach apply to systems design as well? Is it no different to design for making end of life care in hospices more humane? Or to provide teenagers in the South Bronx with the means to improve their access to fresh and healthy food? Or to catalyze a composting program at a low-income housing complex? Or to help nurses to comply more effectively with hand washing protocols in hospitals? Or help the children of informal settlements (the favelas in Brazil or border towns along the US/Mexico boundary) have a stake in the development of new business ideas in order to increase economic opportunity? What changes in the shift from short-term, artifact-oriented problem solving to systemic engagement? How does one build complex cultural knowledge and hope to intervene productively at the same time? Embracing “wicked problems,” to use Horst Rittel and Melvin Webber’s famous formulation, does not mean that the design approach is self-evident.

As the Transdisciplinary design program has evolved, we have developed several design strategies in combination that we feel equip the students to begin the process of engaging this challenge:

- Critical reframing: bringing together diverse stakeholders and their perspectives in order to take a known problem and reframe it in ways that present novel opportunities for change.
• Collaboration: all of our projects require that students work together in small teams. First, this effectively disarms the idea that designers are lone geniuses that can solve things with a stroke of the pen; second, the multidisciplinary perspectives reinforce the critical reframing of otherwise too familiar problems.

• Design probes: innovative, participatory methods for producing explicit and implicit knowledge using workshop techniques and designed prompts.

• System mapping: visualizing the complexity and the boundaries of the cultural situation in order to discover where best to focus one’s efforts. It is only in this way that one can identify what Donella Meadows refers to as “leverage points” within complex systems.

• Fitness prototyping: the most difficult step. The aim is not to “solve” a problem but to model future system states and the steps necessary to catalyze this change in ways that are feasible and properly scaled.

The program emphasizes a model of design practice that is participatory and bottom-up. Rather than impose one’s own vision upon unsuspecting communities or passive participants, we build upon the tradition of participatory design and vigorously embrace the idea that systemic change is most effective when designers incorporate as many perspectives, voices, and opinions as they can. This orientation has led, not surprisingly, to an increase in the use of quasi-ethnographic methods in order to elicit and build cultural “understanding.” One recurrent challenge that tends to disrupt and even distort the design process has been that students have struggled to know when to stop the process of building understanding, since these complex and diverse communities are fathomless when it comes to implicit cultural knowledge. Students often find themselves stuck at the level of the probe and not the prototype. In other words, they are comfortable designing conditions and techniques for gathering more information but reticent to commit to designing potential outcomes. This is not entirely surprising, given the politics of the participatory process. Students want to honor the voices of the underserved communities and as designers they are reticent to impose a vision from outside.
Shift 1: Context

“The specific point is that as a professional activity design does not occur, does not happen, through its own volition. Rather, Design—modern design, professional design—is called into being by Industrialization...” --Clive Dilnot

There are two novel characteristics to designing for system change that fundamentally and qualitatively alter the design process and reconfigure the modalities of practice along the way. The first is the context; the second is the nature of the intervention. Clive Dilnot’s quote helps us to situate design contextually within the tidal draw of the industrialization. Professionalized design practice as we have known it has operated since its inception according to one predominant model: a client pays a fee for service to a designer in exchange for work produced. In exchange for a fee the designer is expected to return a “deliverable.” That final, delivered product cements the transaction and effectively terminates it. Money flows from the client to the designers and drawings, models, and/or prototypes flow back to the client. It is a simple, reciprocal relationship that has endured for close to the century that design has been professionalized.

This transactional model, which has been rooted at the center of the professional design paradigm, collapses when shifted to designing systemic change for social justice. This is for two reasons. The first is a simple one: there are very few commercial clients for jobs whose ends are oriented toward social change. Professionalized design operates and has operated primarily in a commercial marketplace. Ameliorating the situation for those who, in many instances, have been either abandoned by or squashed by the marketplace has more often been the purview of social service organizations, international development, or charity—few of which operate within the transactional space of the marketplace. The fee-for-service model simply does not often apply within a social design context. Until there is an express and explicit financial value put upon social change (Robert Putnam’s concept of “social capital” goes some way toward monetizing social cohesion), the fee for service dynamic simply will not apply effectively to these situations.

Additionally, in most social design contexts, the client/designer formula is also categorically irrelevant. Rather than a paying client and a delivering designer, we
frequently see an assemblage of stakeholders consisting of a community group (or representatives thereof); a university and its design students; a government organization or entity; occasionally a traditional design consultancy; often a foundation or philanthropy; and in some instances a “lab” or some other novel configuration that sits between the other five entities (for example the Helsinki Design Lab, DesignNYC, or IDEO.org). The designers themselves typically come from either the university or from the lab (or sometimes the consultancy); the capital typically flows from the foundation or the government agency; and the community is often at the center…wittingly or not. For example, years ago I worked on a project in Philadelphia designing an open space plan for a low-income community. The project involved representatives from a local community group, students and faculty, community members, city agencies, politicians, a philanthropic organization, and at times the developer and their subcontractors. The project was jumpstarted by the community group, catalyzed by the university students and faculty, supported in part by the developer, abetted and undermined by local political representatives, nursed along by the philanthropy, contested by the Housing Authority, dropped by the developer, and eventually it actually came into existence due to the dogged persistence of the community organization with support by the mayor (who appealed to a foundation for the funds to build the park).

What is distinctive about this kind of configuration is that it, too, further unsettles the traditional fee-for-service model. More stakeholders and no clear client/designer relationship means that agency is more distributed and diffused. This often leads to a more fragile choreography for the project and, I would argue, more likelihood that it will not come to fruition. This reconfigured assemblage may explain why, in my experience, I see so few socially engaged projects actually reach closure. Because the client/designer model is disrupted and more diffused, and because nobody is paying directly for the deliverable, agency and accountability often becomes slippery in the midst of so many interested parties.

Is it because the payer/payee relationship is clouded? Perhaps. But this unfinished state of affairs is also due to the systemic nature of the problem itself. Design simply becomes harder—if not nearly impossible—in the maw of systemic entanglements.
How entangled are these systems? Let’s look more closely at a different design context: hospice, or end of life care. If the aim of the designer is to intervene in this often suboptimal system of care in order to increase the quality of the patient’s overall experience, then what does she need to consider? I would break it down into six categories: Actors, Services, Activities, Places, Things, and Experiences. Taking this to a more granular level, a designer might have to consider any or all of the following:

**Actors**: the patient, doctors, staff, family, friends, administrators, lawyers and even microbes and viruses…

**Services**: law, insurance, healthcare, information, finance…

**Activities**: sleeping, bathing, resting, exercising, eating, dressing, therapy, socializing…

**Places**: bed, room, facility, building, landscape, transportation network, geography, country…

**Things**: equipment, interfaces, food, plants, clothing, cleaning products, entertainment…

**Experiences**: living, dying, support, communication, emotions, sensations, hopes, dreams, memories…

All of these associations, as Bruno Latour might describe them, are actively assembling into new configurations that one can only ever understand provisionally. But to design for this dynamic, near infinite, combinatorial mess—to understand the causal and correlative relationships—is impossible. Systems present, then, an inchoate assemblage of mutually influencing actors and actants, moving in unanticipated directions and affected by the social equivalent of fluttering butterfly wings.

**Shift 2: Intervention/Speculation**

Donella Meadows in her seminal book *Thinking in Systems* describes the ways in which complex systems are susceptible to change. Leverage points, as she terms them, are those points of inflection within a system where an increase of “pressure” can force a substantive change in the overall system shape and outputs. Designing to identify and affect leverage points is easier said than done, however. Systems are constructs of our own devising. They rarely exist as named entities “out there” for observation and
tinkering with. We define them and their boundaries through our labeling them as systems and through the illustrations we create of them. Systems are dynamic and shape shifting. They do not stand still, nor are they simply a bounded, mechanical set of relations. Unlike technical systems, socio-technical systems—education, healthcare, infrastructure, nutrition, politics etc.—are dynamic, unpredictable, and can be adaptive. They are more than multifactorial. In other words, one cannot just isolate a few key variables and reconfigure those. One can more easily do that with linear, mechanical systems. For example, within Apple’s product “ecosystem,” Apple designs each product—whether hardware or software—to complement and interact in knowable and predictable ways with the rest of the elements of the product ecosystem. So the iPhone software syncs automatically with laptop software—even though they are different in nature. And songs on one device can be stored on another or even on a remote server in the cloud. All parts or the system are optimized (ideally) to be as fully compatible and interoperable as possible. While complex, the system is, in the end, knowable and finite in its operation.

Social and socio-technical systems are more like biological systems in that they can show surprising, unpredictable behaviors. A living ecosystem contains a near infinite set of relations in which small changes to one part of the ecosystem can result in small, medium, or even catastrophic changes throughout. Add more tadpoles and the frog population may rise in the short term, but without an additional food source the overall population will eventually reach a homeostatic limit. Add algae into fresh water ponds or feral pigs into woodlands and the lack of predators or checks and balances pessimizes the entire system—often to catastrophic ends. Small, nonlinear changes cascade across the ecosystem causing massive imbalances and, potentially, system collapse.

For design students, the risk of catalyzing system collapse is unlikely (I hope) given that they are simply trying to make some sort of impact within complex socio-technical environments. Their more immediate challenge is the difficulty in defining the boundaries of the design problem and in identifying a design deliverable. For my students this typically results in a familiar foreshortening of the design process; a cessation at the stage of discovery; and an unwitting reluctance to design, as described above. Surprisingly, at this impasse, an ethnographic impulse seems to take precedence over a
design impulse. This has manifested itself in a proliferation of workshops and design probes (fig.1). While the workshops and probes are often ingeniously designed, this activity of design provides the students with a premature sense that they are designing outcomes when they are really redesigning process. The workshops and probes dig deeper into the problem, but they don’t provide the outlines of a way forward.

Figure 1 Workshop plan for Blank Plate (Amy Findeiss, Mai Kobori, Eulani Labay)

The more vexing work—the work they are still trying to grasp—is the work of intervening into, or even reconfiguring systems. How that is done, however, is not self-evident. Part of the solution, it seems to me, lies in the relation of the part to the whole, and the ways in which designers might be able to hold in tension both the part that they are designing—for they are only ever going to be able to design parts of systems—and the relation that that part may have to the larger complex. Synecdoche, the term in rhetoric for the part that stands in for the whole (for example “the man” standing in for a whole system of capitalist or racist exploitation), seems like one way to think through a strategy for identifying leverage points for modifying a system. This tension between the part and the whole is not something that designers typically investigate. It is a delicate
balancing act: the part never seems quite sufficient while the whole always seems beyond one’s grasp. The “part” itself takes us back to the realm of the artifact, in many instances, and it has all the requirements of artifact design (form and function). But to settle on it alone would be a mistake. I would propose that only by juxtaposing these two scales of action and holding them in a productive tension can one begin to address the vicissitudes of the challenge.

*Hello Compost!* is an example of a student project that managed this balancing act while proposing both a point of leverage as well as a system to manage the change. Working in a low-income housing complex that already housed a small urban garden, the students aimed to catalyze behavioral changes that would result in residents composting their food waste, first and foremost, while providing them with self-sustaining incentives for doing so. Their leverage point was the act of composting itself—something the residents were either unaware of or reluctant to take on (often due to storage and hygiene concerns). Drawing upon insights they gleaned from extensive research into the residents’ behavior, attitudes, and physical storage space, they designed a compact, reusable bag that was functional and stylish, reframing composting from an unhygienic chore to a more aesthetically engaging act. That, alone, however, would never have been enough. In addition, they designed a financial incentive system that turned composted food waste into a revenue source that could be used to purchase fresh produce from the urban farm on location. The tension they created then—between the bag as artifact and the economic system—allowed them to create a systemic approach that kept in balance the hopelessly partial aspect of what they designed (a bag [fig 2]) with a broader, more comprehensive model for systemic change (the incentive system [fig 3]).
Figure 2: Hello Compost! bag (Aly Blenkin and Luke Keller)
The element absent from the *Hello Compost!* project, however, is the critical third step, an illustration of the future state that the artifact and the system together would produce. Could they not have illustrated the future system state where residents were efficiently and productively turning waste into food, and perhaps building a more resilient community in the process? What would that look like…literally. This final step, which
often necessitates visionary flights of fancy, speculation, and imagination can seem frivolous in relation to the everyday, pressing needs of a community. And for many designers that are trying to catalyze the community’s own self-determination, it may seem arrogant for the designer to presume to outline a future for the community. For that reason, I believe, most designers avoid this step—but I am beginning to understand that its presence is essential. A typical deliverable for the design of systems might therefore comprise these parts:

- the “whole”: a visualization of the stakeholders, the system, and the resource flows
- a designed “part” that bears a clear relation to the whole
- a projection of how the change in the part reconfigures the cultural behavior of the system elements and models that system change

Each element of these three steps is only partial; the key is to illuminate the part/whole tension while modeling future system states. The students’ deferential tendency to overlook prescribing future behaviors undercuts the project’s ultimate success. It is the designers’ responsibility, I would argue, to model future system states by creating a compelling, shared vision of the possible. These visions must map future possible behavior back onto the (reconfigured) system itself. Speculative and visionary, they are a form of projective or prospective ethnography, modeling future behaviors within socio-technical systems.

Two forms of speculative design and thinking are familiar from design history: the utopian and the critical. Each of them, however, overemphasizes the designed over the lived. Frank Lloyd Wright’s utopian Broadacre City, for example, promises a socio-technical future of flying cars and radically re-engineered, master-planned landscapes. And while it rewrites the script for how and where we live, its genesis is not the will of the many but the monomaniacal vision of one. Archizoom’s No-stop City, by contrast, extrapolates socio-technical trends of their time to project a vision for a mass-commoditized monoculture of shopping and unblinking, overhead lighting. Its aim was ultimately to expose the hypocrisy of future planning and force an engagement with radical alternatives by demonstrating the emptiness of current design and lived orthodoxies. While each contains elements of a speculative ethnography, neither builds
upon the textured ethnographic insights of lived, community experience. They are abstracted design ideas, not situated ethnographic visions.

Speculative ethnography may open up a novel space for design to build upon past behavior by making visible new forms of action. This process of envisioning is essential to nudge a system toward new outcomes. But by “system” here we are really describing a way of life, or at least deeply embedded cultural practices. This step sits at an awkward point both for socially oriented designers and for design oriented ethnographers, however. For the designers, they must speculate on future behavioral patterns and relations, and this can seem perilously close to the worst forms of authoritarian social engineering. For ethnographers, whose work is typically retrospective and anti-interventionist, the idea of “guessing at” or inventing futures runs counter to their more empirical and deductive tendencies. But without modeling future systems change—without providing even the contours of possible futures grounded by shared practices—there will be no design catalyst for the community to dream different dreams and bring new realities into being.

Bibliography
Dilnot, C. (2014). “In the future design will be very important, Designers less so.” Unpublished manuscript.