

The Grammar of Design Thinking: The Histories and Promises of Socio-Material Practice Remaking

PART ONE: THE HISTORY OF DESIGN THINKINGS

Design thinking has had its zealots and its detractors, but as Michael Dilla once said, at least people are talking about design, and what's more, using the word thinking in association with design.

“Design is Easy”

A quick way into design thinking is define it as design by non-designers. If you take what designers do and export it to non-designers working in or on situations not traditionally thought of as appropriate for designing (such as more social or economic problems, versus the production of visual or material products), then design thinking, as opposed to designing, would appear to be involved.

However, there are few not-unusual observations that problematize this way of approaching design thinking:

- **Everybody Designs**

Any deliberate action is a kind of designing, an action intended to change your situation, presumably for the better, as Herbert Simon is often quoted as saying. We all make stuff, from cakes to migrations, and most of the time we more or less think about what we are going to do before and while we are doing it. To this extent, designers are not qualitatively different from any other kind of person, and everybody can think like a designer without specialist training. Designers are instead quantitatively different; they spend more time, and have more and a wider experience of, designing, and so are both more considered or slower about their designing, and more intuitive or faster about their designing; they are, in short, like Aristotelian virtues, excellent at what everyone is merely competent.

- **All Professionals Design**

Insofar as designers have a practical expertise, deliberately deploying technical knowledge and knowhow to service others in reliable ways, they are like all other professionals; or, to put it the other way around, all professionals make use of design thinking. Donald Schon has made this argument most insightfully. Schon, reacting to the domination of the technocratic account of professional expertise, found a more phronetic model in the think-work of designers (or in truth, the version of that think-work that was articulated in a particular mode of doing architectural desk crits). The Deweyian action-research cycle that he found in the way designers make decisions about their emerging designs, he also found in the workflow of managers and psychotherapists, and others researching with Schon or with his insights, have confirmed in planners, engineers, teachers, nurses and social workers. Designing, or at least design thinking, are not the provenance of designers alone, but manifest in

the approach to people and the world that we call being professional. However, there are things that designers attend to in the deployment of their expertise that other professionals mostly do not, or not to the same extent – those are what have been called the visual thinking and material thinking components of the craft of design work, what Schon referred to as ‘conversations with’ or, more suggestively, the ‘back-talk’ of images and sketches, and materials and tools. More on this below.

- **All Applied Researchers Design**

As I will explain below, design has tended to differentiate itself from the craft of making by the fact that it analyzes the community context it wants to service by making something; in other words, designing involves thinking about what (and for who, and why) is going to be crafted before, or at least during, doing so. As design has formalized the process through which it is learned, from apprenticeships, through atelier studios in technical colleges, to graduate courses in universities, this ‘thinking’ that is inherent to designing has been identified as a kind of ‘research.’ Especially in Anglo-Australian contexts, many have argued that designing is a kind research. Without getting into the debate about practice-based and artifact-based research, a more basic argument is that a normalized design process – inductive contextual research, abductive ideation, prototype testing, evaluative recommendations – concurs with a model of technoscientific applied research. Scientists, whether natural or social scientists, but especially technologists (as in, ‘Research & Development’), also creatively generate hypotheses, make models, design experiments, and extrapolate plans based on the results; in other words, they design. So again, the thinking that designers do, qua research, is not unique to designers; though the methods, especially those that are more creative, visual or material, tend to be.

As a result of these not-unusual observations, I want to talk about ‘design thinking’ in a different way; not the merely instrumental deployment of design as a way for non-designers to think more creatively about problems; but rather the more unique ways in which designers think when practicing their craft.

But wait, there’s more...

Often when the marginal goes mainstream, the relation between what was practiced and what gets promoted is strained. Sometimes, it does not matter that there has been this translation, or adaption, even if reductive. But it can matter if what really might make a difference is what has been occluded by the mainstreaming. What then is the design of the ‘design thinking’ to which so many are turning today? But more significantly, what else might be the design of ‘design thinking’ toward which we might turn?

What follows is my attempt to lay out what I understand to be the nature of designing, what, I would suggest, is most interesting about designing, as opposed to what tends to be championed today as the design of design thinking. I want to run through this genealogy because I think that there is an opportunity for the second coming of design thinking (now that design thinking has been declared dead by one of its first, prominent promoters) to move further, especially in relation to areas that I am most concerned about: like

sustainability. I am going to stereotype design thinking 1.0 as ‘playing nice’ and contrast it to ‘practice-world-remaking.’

The Ideal of Idea Realization

I must say that I have a personal stake in this. My undergraduate and doctoral education were all philosophy and theory: Heidegger and French poststructuralism. I ended up in design only more or less by design. I was an environmental somewhat-activist as a student and so it frustrated me enormously that some of the smartest people I knew, my colleagues studying continental philosophy, refused to sully themselves with the econo-material politics of things like sustainability. In reaction, I sought a robust bridge between theory and practice. I found it via Tony Fry, a Marxist designer reading Heidegger who wanted to break with the liberal pluralism of the university. I joined Tony setting up an alternative research and education institution, the EcoDesign Foundation and so learned about design, and then assumed the job of teaching sustainability to design students, something that design schools outsourced to the EcoDesign Foundation throughout the '90s, generating an income that subsidized our independent theoretical work.

I should note here that the design that I was drawn to and am drawing on for what follows, is more meso-level, or human-scale design, that is, the design of products, whether hand-held devices, clothes furniture or rooms, as opposed to architecture and urban planning. Architecture can be seen as merely assemblages of a large number of products, from windows and doors to flooring, roofing and walling components. But architecture's tendency to work with form from-the-outside-in often denies it the kind of human-centeredness that I think is the more interesting insights of more recently developed practices of designing. This is a large argument, so for now, please accept that whenever I say ‘design’ below, I am not talking about architecture.

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As an aside, for non-designer readers, it worth considering the following rough map of different kinds of designing. Design, even when restricted to the realm of creative material practice, as opposed to more generically planned actions, is already a word that is stretched horizontally as it were from Architecture and Planning to Art and Craft. Within those ‘disciplines’ formally called design, there is enormous variation, with very little relation between how a fashion designer and an industrial designer works, even though both develop ‘meso-level’ products. The discourse of Design Thinking that has been promoted in strategic management circles draws mostly on the designing that happens between C4 and I7.

Some notes about this map. From top to bottom is roughly chronological, though obviously not to scale, with the current leading edge of design discourses at the bottom. From right to left is roughly a reduction in scale from large to smaller, though this is confused somewhat by another left-to-right shift from material to meaning. The kinds of design also somewhat relationally position: for instance, fashion designing is a process that combines product and communication design.

A MAP OF DESIGN

	A	B	C	D	E	F	G	H	I	J	K
1					Craft					Art	
2		Architecture				Products		Communications			
3	Planning			Transport			Fashion				
4					Digital			Interface			
5		Service Design				Interaction				Experience Design	
6				Design Thinking				Strategic Design Management			
7					Social Design						
8				(Design-enabled) Transition				(Design-enabled) Social Innovation			

What I saw in design, was a process for realizing ideas, for materializing ideas, making them real – exactly what my philosopher friends needed for their smarts to exit the realm of abstraction. From my philosophical perspective, design represented an ideal, the ideal of giving agency to ideas. This is important for contextualizing the point of this piece:

I want to be critical of design thinking, as it is currently promoted as a solution to our troubles outside of the practice of design, not with respect to the everyday realities of practicing design, though I will mention these disputes, but from the perspective of design at its best, the possibility that lies at the essence of design. What is promoted as design thinking at the moment is a process taken from the way design is practiced commercially; this ignores what is distinctive, and most powerful I believe, about design. If design thinking is not to be just another way for companies to generate marginal profit increases within business-as-usual, but rather a force for change, a way of developing wholly new kinds of businesses, or post-businesses (non-shareholder-value-growth-driven), then the design thinking taken up, especially by educational institutions, must be more thorough, more idealistic, more ambitious.

Design's Educational Idealism

It is important to note that this way of talking about design, with respect to an essential excellence, is not inappropriate for design. I will explain in what follows, how design, as the capacity for deliberate forethought about what futures to make, as the practice of planning before doing, not only has the power to access the ideal, to contemplate the best of all possible worlds, but has an obligation to do so. These ideal scenarios must always in turn be compromised, tempered with reality, when it comes to their realization. Nevertheless, it is a

crucial part of design, when done well, to determine what would be ideal and make this an evaluative criteria of other design propositions.

This is evident in the fact that design, in its modern form, has its birth in a modernist art education project. Contemporary design, at least in the European tradition, formally commenced with the Bauhaus, a project that Alain Findeli has usefully characterized as the constitution of a new kind of human through different mixes (at the Bauhaus' different manifestations in various locations throughout the 20th Century) of the ideals of science, art and technology. Modernism promised to clear society of the evolutionary mess that were traditional built environments and replace them with more principled designs.

The universalism of that European birth of design was wrong, both in end and means. But the faith that the ideal is discernible, if not realizable, remains an aspect of design process, as I will argue further below.

At the least, the Bauhaus foregrounds that a discourse of design thinking is not new. Design, perhaps because it was such a late entrant to the professions, and certainly to the disciplines, has always been very self-conscious about its own nature, articulating the thinking that is asserted to be the basis of design (if not actually at work in designing). The birth of American industrial design for example, lay in what these days is called strategic design, combining product styling and packaging design with early examples of new market creation through experience design of end-to-end branding. To sell these new services, the Streamliners, like Raymond Loewy, Norman Bel-Geddes, Walter Dorwin Teague and Henry Dreyfuss published widely, articulating their purported methods in promotional books and pamphlets.

Design Thinking v1: Design Methods

If design thinking has always been part of design, the phrase itself has been called out several times in significant design movements that are almost never cited in current promotions of design thinking. The first of these is the “design methods” movement. In response to the recognition that design operates in the domain of artifice and possibility, the design methods movement attempted to create constraints and techniques that would lend scientific validity to the propositions of these experts. While current management theorists claim that the fusion of design and management is a recent initiative, the design methods project came out of scientific management theory, most explicitly the decision theory approach of Herbert Simon with his collection of essays, *Sciences of the Artificial*. The aim was at the least to provide more rational, and so more reliably reproducible, bases for selecting optimal solutions to complex problems, at the best to articulate the rules that an artificial intelligence system could deploy to design without subjective human interference. Other prominent contributions came from Christopher Alexander – a mathematician who attempted in *Notes on a Synthesis of Form* to develop algorithms and diagrammatic decision trees for design problems with complexes of conflicting requirements – John Chris Jones – who published the first collection of *Design Methods* – and Peter Rowe – whose *Design Thinking* elaborates the formal constraints that architects process to develop propositions.

The Design Methods movement was more concerned with prescribing how design should be done in order to attain the status of technocratic expertise, than it was in describing how design was actually practiced. This led to ructions and ultimately, as with the artificial intelligence movement more generally, the displacement of that prescriptive project with the development of ‘expert systems’ that aimed to support skilled human practices. The most prominent breaks with the design methods movement came from two of its original leaders: Christopher Alexander almost denounced his previous involvement and embarked on the work for which he is more famous – curating a catalogue of cross-cultural couplings, or ‘patterns,’ of spatial forms with everyday habits; John Chris Jones published a second and third edition of Design Methods, but each time with a preface that pretty much undermined the spirit of the book – the preface to the second edition explained his dissatisfaction with Design Methods with a series of pages whose sequence was determined by John Cage inspired randomization (the only ‘method’ that Jones in the end endorsed), and the preface to the third edition explained via a mythological dialogue the need for more politically engaged designers tackling larger-scale social problems.

Nevertheless, a legacy of the design methods movement, that I will underline in what follows with respect to a design thinking that is more appropriate to our current circumstances, is that designing can no longer hide behind the black box of intuition. The Design Methods project failed to engineer a box that could replace designing, but it did nonetheless expose how designing could be understood as what Herbert Simon called the ‘bounded rationality’ of ‘satisficing.’ The situations negotiated by designers could not be reframed for logically calculative solutioning, but designers do reframe situations to allow a kind of reasoning, about which are the better abductive responses to that situation.

Design Thinking v1a: Design Thinking-in-Action

After the Design Methods movement, Donald Schön, a theorist of innovation and professional expertise, was looking for a model of non-technocratic change agents. Schön discovered it in the thinking of designers. From a case study of the interaction between a studio leader and his (female) design student, Schön identified what he called ‘thinking-in-action,’ the way in which designers make micro-critical reflections on each of the solution-oriented moves they make when tackling a design problem. This action-research cycle has two important aspects.

Firstly, in contrast to the scientific method, which analyzes in order to develop a hypothesis that can be then experimentally tested, the reflective practitioner that is a designer is more pragmatic (in John Dewey’s sense), making an intervention into a situation in order to understand something about that situation. This ‘do first’ or ‘learn by making (a perturbation in the situation)’ is a crucial distinguishing feature of design thinking, something that makes social scientists for example very concerned about designers: not only do they have an interventionist disposition, but they deliberately make seemingly random disruptions in a context before understanding anything about it as a way of coming to understand something.

Secondly, the evaluative component of the action-research cycle involves projection. Schön describes this as the designer ‘having a conversation with’ the material, or the sketch, or the situation. Having made a move, the designer reflects on whether the outcome is surprising or not. When elaborating a design idea, the designer does not want a surprise; the design being developed should just get clearer. But often the designer wants to break out of a current way of understanding the situation, and so is looking for a surprise, one that opens up new perspectives or design directions. In either case, the designer adopts the role of the material with which he or she is working, or of the design, or of the context itself, in order to ‘talk-back’ to the designer, informing him or her about what is happening. I will speak about this more below, but this capacity of designers to speak on behalf of that on which or with which they are working, to ‘other’ themselves into the position of what is being designed, feeling whether it is working, is a crucial performative component of design thinking.

Design Thinking v1b: Wicked Problem Thinking

Another figure who was involved in but then moved away from the Design Methods movement and has made significant contributions to understanding design thinking is Horst Rittel. Rittel was involved in some of the later Bauhaus schools, but while at Berkeley as a planning and information systems academic famously identified ‘wicked problems.’ These are problems that cannot be redefined for rational solutioning (= ‘tame problems’). Beyond being complex, the social factors associated with these problems mean that they resist conclusive definition. As result there is no single appropriate way of understanding what is issue (for who is the problem a problem, when, where, how and why?), leading to multiple, equally valid solution-fields and no clear sense of when the problem is solved. Rittel and Weber’s essay on wicked problems, promoted by Richard Buchanan’s influential essay “Wicked Problems in Design Thinking,” is often-cited but rarely-read, though a recent collection of Rittel’s articles and seminars should halt this. A consequence however is a misreading. Rittel may have argued that design problems are invariably wicked, but he did not argue that designers, as opposed to engineers or other rational decision-makers, were especially adept at negotiating wicked problems. Buchanan highlights the tolerance of indeterminacy that is required in relation to wicked problems, but Rittel explicitly refuses design ‘intuition’ as an aspect of that tolerance. He instead insisted that design be more deliberative: that it be more concerted about arguing persuasively about which issues should be prioritized; more systematic about generating a wider pool of options in response; and more rational about considering more fully the consequences of those options. Buchanan correctly I believe suggests that design must be located within the ‘liberal arts’ as a consequence of Rittel’s characterization of problems such as those faced by designers, and below I will return to the importance of designers as rhetoricians and politicians.

Design Thinking v2: Research of Design Thinking

It ironic that current popular proponents of ‘Design Thinking’ make no reference to the Design Thinking Research Symposium. This semi-regular series of conferences has been taking place for more than 2 decades as a forum for Research of Designing, that is, studies of the cognition of designers designing (as opposed to, according to a common tripartite distinction, Research for Designing [the research done into design contexts as part of the designing process] and Research by Designing [aspects of situations that are revealed by

creative design interventions, often artifact based]). The result, also evidenced by the longer running Design Studies journal, is the emergence of a rich picture of how designers think during the act of designing. Close observations of the design process, supplemented by controlled experiments and tests, have discerned what is particular to the way (expert, by contrast with novice) designers, alone or in teams, approach a range of design problems. The connection with more current exponents of design-based strategic management is only just now being made as a result of Nigel Cross' recent book summarizing key findings of the Design Thinking Research community under the title Design Thinking. For the purposes of what follow, I would underline these conclusions about designing:

- **Visual Thinking**

Expert designers are more adept at imagining objects and spaces in detail and from multiple perspectives than most people. This seems to be evidenced by their capacity to solve complex visual problems that require, for example, mentally rotating shapes.

- **(Visual) Analogical Thinking**

Expert designers are more adept at seeing-as, recontextualizing one thing for a diverse array of other uses or meanings. In creativity tests, designers are considered to have high levels of flexibility (number of different categories of ideas) and elaboration (detail or extension of ideas) in creativity tests (in addition to the other two criteria of the Torrance Test of Creative Thinking: fluency [number of ideas] and originality [comparative rarity of the ideas]); and designers tend not to get so stuck when puzzles require the solver to use some device in ways other than it was intended. I will focus below on this important capacity to see use, to see the world in terms of usefulness, and creative alternative uses.

- **Precedent Patterns**

Expert designers collect a large number of diverse design propositions, their own and those of others, which they also informally (though sometimes formally) catalogue in terms of approaches to design problems. This allows these design propositions to be recalled as precedents that can guide, analogically, a designer's approach to a new (kind of) problem.

- **Abductive Problem-Solution Coevolution**

The process of expert designers is solution-oriented with quickly proposed designs. These ideas appear to be abductively generated hypotheses about possible solutions that are used to better understand the problem. Each design proposal is only worked up enough to bring clarity and/or insight into other ways of understanding the design context. In this way, the understanding of the problem develops with the design solution, rather than the former being completed before working on the latter.

- **Non-Fixation through Research-to-Detail Oscillation**

Novice designers follow the waterfall methods in which they have been instructed: problem-define; research; ideate; judge; detail. They are also loathe to abandon their first design ideas. Expert designers appear to shift haphazardly between all components of the design process, developing ideas to significant levels of detail (and drawing on deep technical knowledge) but then returning research, ideation and (see previous point) problem-definition. As a result expert designers are less fixated on their first ideas (though their expertise tends to mean that their first ideas lie in what will become, but for reasons established only later in the process, the most promising solution fields).

- **Sketching/Modelling for Collaboration**

Designers facilitate their abductive solutioning in design with visualization tools, from paper-based sketches and diagrams to CAD, and with lowfi to highfi prototypes and models. However, designers never work alone, and in this context, sketches and prototypes are also recognized as crucial tools for collaborative designing (especially where teams are dispersed over space and even time). They are not only a communicative shorthand for complex design ideas, but become project management tools, articulating aspects of the design about which there is consensus and that can therefore be considered as fixed for now while attention is turned elsewhere. Expert design teams have established ways of organizing and mobilizing images and component/feature names.

Design Thinking v2b: Research Thinking for Design

Throughout design's history, despite coexisting with a self-consciously idealistic design education, the design profession has often claimed the status of the artist or craftsman, with an embodied skill, if not genius. As a result, despite always being end-user market-focused, design was not often based in thorough understandings of the needs and abilities of its users. In many ways, design was taught to be more thorough and innovative in its research by software engineering. The power of computers led to a tolerance for the steep learning curves required to access that power, relieving computer scientists of the need for usability considerations. Two forces changed that: the domestic market for computers; but more significantly, at least in terms of what drove the research innovations that were then adopted by designers involved in the domestication of computing technologies, strong Scandinavian labor politics which insisted that computers enable the retraining of workers, rather than merely accelerate their replacement by an emerging technocratic middle-class. The Computer Supported Cooperative Work movement, which broadened into the Human Computer Interface discipline, developed a large variety of social research and innovation techniques that better enabled designers to understand the practices (whether everyday habits or workflow patterns) of those the digital designs aimed to serve. Some of these techniques were translations of anthropological methods, such as qualitative (longer) interviews (rather than surveys) and in situ (participant) observations (rather than lab experiments). Others were more 'designerly,' what Liz Sanders calls 'generative research;' these tend to be either creative exercises done by research subjects or creative ways of doing data analysis by design. These techniques blur into collaborative or participatory design processes, where designers scaffold people into doing some of the designing. As everyday devices were digitized, many of these techniques have been increasingly imported into product design. And so 'interface design for usability' became the wider research-led process of user-centered design, later referred to as interaction design and then (user) experience design (as distinct from, but related to, brand-based experience design).

The current adoption and promotion of 'design thinking' by strategic management, especially in manufacturing and retailing, draws heavily on this 'human-centered research' practice of design. In other words, the 'thinking' is less that of designing – the thinking that is particular to how the act of designing takes place – than it is that done by designers before they start designing – the thinking about the design context and those they are designing for before commencing the act of designing.

Design Thinking 3.0: (Business [Innovation]) Design Thinking

It is primarily managers, or at least authors of management books, who are behind the current vogue for design thinking. The designers involved tend to be principals in design firms, with managerial roles, particularly the role of growing the design business by moving it into the domain of larger-scale strategy where it is competing with management consultants. It is worth indicating that there is perhaps a continuum:

Design Management – Design Thinking – Managing as Designing

Designers have always been managed, and there is a subdiscipline associated with that task – or dual task. On the one side, there is the human resources challenge of herding creatives; and on the other side, there is the need to secure resources for the design from spreadsheet commanders. The design managers job therefore extends from creative team project management to new business development, whether in a consulting design firm, or as the person responsible for an in-house design unit.

More recent has been a marginal attempt to introduce the way designers think and work to the task of management in general. The edited collection under that title, *Managing as Designing*, by Collopy and Borland, makes reference to other foundational figures in relation to this argument, such as Fernando Flores.

However, in most cases, design thinking represents something in the middle of this continuum, something more about an alternative innovation strategy. By contrast with more incremental innovation approaches common to trained managers – quality assurance, kanzei, six sigma, lean manufacturing – design thinking (as an additional tool in the box, not a replacement) is promised to enable more radical breakthrough innovation.

Roger Martin, one of the leading exponents of design thinking, intends his book, *The Design of Business*, to promote the integration of the traditional analytic, algorithmic, validity-oriented world of business management with the more creative, heuristic, reliability-oriented world of design. A designful manager (to use Marty Neumeier's term) is using design to develop new product ideas, but also to lead the company more generally. Roger therefore could be said to lie right of center in the continuum above, whereas Robert Verganti's *Design Driven Innovation* lies more to left of center. Verganti's text is less concerned with design thinking (and Verganti has been critical of (user) research-led designing) than it is with 'designing proper', and how managers can best understand the value of design and designers.

In crude summary, I take the management-dominated version of design thinking to be mostly derived from design research and comprise:

- 1. Immersive Social Research**

As many representatives of a business as possible should have as many learning

encounters as possible with as wide a range customers as possible. These encounters should be creative in order to free up either party to learn more about each other.

2. **Creative Ideation**

People should use a wide array of techniques to liberate themselves toward thinking in unconstrained, lateral ways about other possibilities for how the business can service those who provide its revenues. Attention should also be paid to other ways of designing work environments to create ambiances that facilitate the creativity of representatives of the business typically not considered ‘creatives.’

3. **Iterative Prototype Fieldtesting**

Ideas should be physicalized and deployed as soon as possible. Rather than analyze design ideas, low-fi prototype and roleplay with them, in as real-a-setting as possible; only then will the value(less) of the idea be discernible – in ways that allow that idea to be elaborated, or that allow other ideas to arise.

These three are not necessarily in order, and not necessarily distinct: a participatory design session could get business representatives and customers collaborating, brainstorming ideas that are immediately tried out in order that the former might learn more about the latter, rather than with the aim of actually developing viable designs.

PART TWO: DESIGN THINKING SAME OR DIFFERENT

Why Design Thinking Now?

While I hope I have indicated that discourses about design thinking have been an important aspect of design throughout its relatively short history, it is nevertheless true, I believe, that design today is receiving more attention from outside of design for qualities that designers do practice, or at least value. Why is this happening now? I want to answer this question by way of making some critical comments about design thinking, comments that I hope also go toward ensuring that the subsequent take-up of design thinking occur with more forethought about the power and dangers of design. Very crudely, there are 4 aspects to post-industrial society that appear to be either driving or welcoming ‘design thinking.’

1. Customization

There was significant wealth generation, both societal and household, in developed nations throughout the second-half of the twentieth century as a result of credit-based consumption of material goods, fuelled by cheap-oil enabled suburbanization (fewer people per dwelling extending private-life autonomy by replacing shared resources with owned goods). At some point, product categories approached 100% market saturation – every ‘consumer class’ household having each kind of whitegood or major entertainment appliance for example. The result is sometimes called ‘the death of demand.’ Consumers return to the market less often, and when they do they can afford to be very choosy. In response, businesses appear to have two strategies available to them. One is ‘the race for the bottom,’ the self-exacerbating cycle between consumers and producers seeking mass cheapness, with varying levels of supplemental quality assurance (Six Sigma, Lean Manufacturing, etc). The second strategy is to pursue higher margins in smaller markets (‘profit pools’), servicing late capitalist desires (resourced by increased buying power) for more customized goods. Customization, especially of the sort that is much more accessible in relation to digital devices, but also in service economies, thus turns to designerly research-based innovation techniques.

However, there is a very important point to be made here. At first, it would seem that design thinking affords businesses ways of better understanding consumers, so that businesses can create offerings that are more valuable to those market niches. But does design thinking merely access more authentic consumer desires, or needs? Or does design thinking’s current significance derive more from its ability to generate new consumer demands? I say ‘generate,’ because one of the key powers that design thinking claims to have over marketing is its ability to access future needs, rather than existing ones. This has always been the power and danger of design, at least in its self-marketing: design creates rather than caters to market desire. Conventional marketing research asks, ‘What do you want?’ This is a difficult question to answer. So if marketers want to get beyond the obvious, it is necessary to present options to consumers: ‘Do you like this, or that?’ But how to access what consumers would like before it is concretized into an option? How to access what consumers would like before consumers themselves know it, or know how to articulate it?

People like Liz Sanders argue that beyond observing, which gets at what people currently do, and interviewing, which gets at what people currently think, lies making,

where consumers engage in creative physical tasks that allow researchers to perceive what else consumers might or will be able to do or think. Now, it is not entirely clear why these kinds of designerly activities would be prescient in this way. More likely is that a dialectic of suggestibility between consumers and researching designers takes place in these participatory sessions. In other words, it is not that consumers' true future needs are revealed, but that desires are created as research subjects (always already configured as 'consumers', if not 'users') get enrolled into what they are collaboratively 'generating' (Liz Sanders' term). (The term 'enroll' here alludes to Woolgar's work on 'user trials' in which he argued that these trials were as much about testing whether 'users' could be made to use a device as they were about whether a device was usable.) Design thinking is in vogue not because it is the definitive technique for finally getting at what customers really want; if it were, the results of design thinking innovation sessions would be the last products businesses would ever need to innovate for this or that niche. Rather, design thinking would seem to be in vogue because it restarts the movement of consumer desire, getting consumers to collaborate in the creation of new needs, a forever incomplete project. Design thinking is popular because it promises a mechanism for stimulating demand, and increasingly individuated demand, in contexts of general satiation.

2. **Creative Class**

Post-industrial society was first identified as the moment at which more people are employed in the service economy than in manufacturing industries and agriculture. It has long been recognized that the rise of this tertiary sector workforce represented a different kind of labor contract. The quickest way to discern this is via Richard Florida's notion of the creative class. These are not merely workers in the creative industries; a wide range of technocrats and professionals qualify as members of Florida's class, including lawyers and accountants. Nor are these to be confused with a potentially emergent new political alignment, called cultural creatives, though part of Florida's motivation in identifying the creative class is to foreground that this employment sector seek postmaterialist values – self-actualization through diverse cultural experiences – alongside and sometimes in place of materialist ones. The creative class is also not generational, though creative class characteristics overlap with those attributed to Gen Y, Millennials and Digital Natives. In short, these are people who are looking for jobs that are challenging and changing, ones that demand some creativity.

That design thinking activities concur with these expectations of workplace activities becomes another factor in design thinking's current popularity. That is to say, companies deploying design thinking claim to have increased retention as all their employees get access to the creative work processes that allow them to self-identify as part of the creative class even if their job descriptions have no relation to the creative industries.

3. **Speed**

In a globally competitive market, interconnected by vast information flows, rapidity becomes a key value. Accelerating innovation cycles, reducing time-to-market, and contracting adoption times, all become a priority. A key facet of design thinking is speed. The commitment to researching-by-doing is also a commitment to compressing

innovation processes, mixing market research in with product testing via low-fi in-the-field prototyping.

This speeding-up is not only on the supply-side. By involving customers in innovation processes, under the guise of democratizing product development, participants are habituated to using products that are ‘works-in-progress.’ Their expectations of businesses delivering high quality, finished products are replaced with the opportunity to be (unpaid) contributors to the finalization of the products’ customization. Design thinking then appears to be the Ikea of innovation. Because customers then come to tolerate if not demand incomplete offerings, products can be sold (though often via the beta-testing freemium model) much earlier in product development cycle. Businesses deploying design thinking can quickly generate revenues, or at least lock consumers who invest time and energy into making a product completely workable into revenue futures, freeing those businesses from the need to raise large and therefore risky investments in R&D. It is then a small step from deploying customers’ free labor in business innovation to crowd-sourcing investments in business innovation directly (through micro-investment peer-to-peer platforms such as kickstarter) And of course, the added advantage is that without formal larger-scale investments, businesses need not remain so committed to those products, even if already in the market; it is after all up to the consumer to ‘design think’ those products into complete, customized functionality anyway.

4. **Dematerialization**

As noted in passing above, the wealth generated in 20th Century in developed nations derived almost entirely from cheap commodities, primarily oil. The 21st Century is already seeing historic rises in the prices of most commodities as a result of depleting supply (Peak Oil, Peak Rare Earth Metals, etc) and increasing demand (Consumer Classes expanding in the Global South and East Asia). Environmental factors are also becoming an increasing pressure, whether those be biophysical (climate change risking potable water supplies) or ecosocial (middle classes increasingly resistant to the pollutants from industries dependent on harder-to-extract materials). The resulting squeeze on margins is forcing businesses to find less materials-intense ways of generating wealth. Throughout the 2000s the EU funded large amounts of research on service systems innovation, with aim of facilitating the transition of industries from manufacturing-for-retail to extended-producer-responsibility closed-loop business models such as use-oriented (leasing products or resource pooling such as a Laundromat or coworking) or result-oriented (performance contracting) product-service systems. This work is now being translated to the US under the title ‘collaborative consumption.’

Shifting from ownership-based economies to less materials-intense systems of usership will require major cultural shifts. The rapid, participatory aspects of design thinking mentioned in 1-3 above, are thought to be crucial strategies for enabling these cultural shifts. By becoming more familiar with innovative ways of thinking about the value that businesses generate for customized, everyday lives, consumer markets should be more willing to experiment with more radical, because more social, economies – ones in which the expectation to participate in the cocreation of value (a key definition of highly

customizable ‘service economies’) is normalized. In this context, the prevalence of design thinking would appear to be part of wider hopes or aims for economic restructuring.

If design thinking is not to be merely about adapting the creative class to more expensive, because more customized and/or dematerialized, service economies; if design thinking is instead to be a force for more disruptively responsible ways of organizing society, then something of the idealism that I argued at the outset should be central to design thinking must be recovered. To do so, I will use the following heuristic: an expanding account of what design, in essence, or at its best, is:

Designers Make

Designers Plan Making

Designers Visually Plan Making

Designers Visually Plan Making Things

Designers Visually Plan Making Useful Things

Designers Visually Plan Making Useful Things for People

Designers Visually Plan Making Useful Things for Sets of People

Designers Visually Plan Making Useful Things for Sets of People in Situations

Designers Visually Plan Making Useful Things for Sets of People in Situations

Designers Visually Plan Making Fruitful Sets of People in Situations

Designers Visually Plan Making Fruitfully Socio-Material People-Situations

Designers World-Make

PART THREE: 'MAKING USE OF' THINKING

Designers Make (Everything is Made and can be Remade)

Humans have for some time been identified as *Homo Faber*, as the animals that make, supplementing their evolved animality with artifice, changing their environments to built ones replete with tools and adornments. I will return in the end to this capacity for humans to make their worlds rather than merely exist in (response to) existing worlds; and to the fact that even so, humans remain subject to those made worlds which condition human life with the same force as nature – a second nature.

For now, I want to make another point, which is that it is strange how little attention is paid to making, given how common it is to assert that this is a key trait of human being. What philosophies of making can you think of? If you eliminate the more metaphoric, or less materialistic, making of meaning, you might be able to arrive at some philosophies of art. But few of these concern the act of making artworks, focusing rather on the act of perceiving already-made artworks. It becomes a discipline of art appreciation to bracket the making (the intention of the maker) altogether. It was Heidegger's innovation in relation to aesthetics to assert that the essence of the artwork had something to do with the artist, with the world-making that happens when an artists makes an artwork.

If you try to focus on the making of useful things, something I will discuss in more detail shortly, you will be left with very little: some disparaging remarks by Plato; a fairly extensive account in Aristotle; then a big gap until Hegel and Marx; and really only Deleuze (though he is more concerned with the new than the useful) in more recent times. Richard Sennett and Elaine Scarry have done some important commentary on these few philosophers of making, Scarry's becoming a creative account in its own right that I will pick up later. The rest, especially of a more empirically derived nature, occurs in the field known as 'research of design.'

The Marxist account somewhat explains the paucity of accounts of making: it is part of the nature of (industrial) society, to repress the having-been-made-ness of things, in order firstly to disempower those who do the making – who, if acknowledged, re-appear as the most fundamental people in society – and secondly to insist on societal inertia – things that appear not to have been made in the first place also appear less remake-able.

Another explanation is what Derrida following Heidegger diagnosed as the metaphysics of presence dominant in Western thinking. The history of productivist Greek-Christian rationality has based itself on discrete, physical entities that just are (objects), there, before us (subjects). Making makes that basis unstable: for it indicates that, at least some of, but therefore maybe any of, what we take to be about us as how it always has been and always will be, was, in fact, made; it has not always been what it now is, and therefore might not always be how it now is; and, more importantly, how it now is, is not necessary, is not how it necessarily must be; how it now is, is rather, merely, the outcome of the whim of some maker at some place at some time. What is about us, and upon which we rely, are, as Bruno Latour insists, facts, in the etymological sense (*facere* – to make); or, as he calls them, in order to foreground the ontological difference from (true) facts, factishes. From the perspective of the maker, there is a fluidity, and therefore contingency, to all that is; and acknowledging that can be quite threatening.

This is then a first important aspect to ‘design thinking,’ to what I will call the ‘grammar’ of ‘design thinking.’ Designers see the world as made. As Elaine Scarry has put it in a beautiful essay called ‘The Made-Up and the Made Real,’ they see the world as doubly made: it is first invented, and then those inventions are realized by unmaking that they have been made: the real is what we forget was made-up. And because designers see the world as made, they see it as utterly able to be remade.

I used to teach a course called ‘Grumpy Design.’ The point was to get students to realize that designers, far from being the happy-go-lucky empathetically, creative human-centered folk that are portrayed in ‘design thinking’ blog posts, are in fact, or should be, cursed by their capacity to the world as infinitely remake-able. From a designer’s perspective, nothing is as good as it could be; everything is available for improvement, for innovation, remaking. Textbooks on being a creative inventor recommend keeping a ‘buglist’ in a notebook, getting in the habit of jotting down every minor thing that bugs you so that later, as you shower, you can come up with the next item on the ‘Innovations’ catalogue. This is what it is, or should be like, to be a designer: ‘Never Leave Well Enough Alone,’ as Raymond Loewy once put it.

In this respect, design thinking is revolutionary. It is revolutionary for example for schooling, which is then forced to be constructivist, teaching not what things are, but how they have been made to be what we now consider that they are. And it is revolutionary for business, whose organizations, from the perspective of designers, are only functional to the extent that employees agree to consider them stable structures, routines that are factually reproduced each day.

Designers Plan Making (Design vs Craft)

Designers are makers, but they are not the only makers. Craftspeople and artists also make. In this section, I would like to talk about the relation between design and craft. That relation is one of negative identity definition: design is not craft.

The story often told (by for example both Chris Alexander and John Chris Jones) is that at some point, craftspeople started to build things of such scale (like large military sailing vessels) that coordination of the division of labor was needed. A master craftsman needed to have an overview of all that needed to be done, when and where. And so prescriptive plans began to be drawn up. At some point, it was realized, or so the myth goes, that the plans provided not only a way of organizing the production of an already conceived product, but a powerful domain for conceiving the product – but I will discuss that in the next section.

Design's birth at the head of the division of labor for the production of things means at least 4 things:

1) **Control of People**

Designers, at their best, should be always mindful that what they are creating is never just a product, but a production. What they design necessitates designing the people who will be employed, in more or less fair circumstances, to make their designs real. Designers are effectively in control of fabricators, and have certain responsibilities in relation to the well-being of those fabricators. To some extent, this was one of the Fabian Socialist origins of design: the Arts and Crafts movement, motivated by preserving the job satisfaction of artisans affected by mechanization, created possibilities for artistic expression in the production process – design as applied arts.

That design impacts workers is something apparent to architects, who are forever fighting with suppliers and contractors, or at least engineers. Fashion designers are exposed to pattern cutters, and sometimes textile manufacturers, but less often to the actual mass-production sewers (though fashion designers do tend to sew their own model garments). Product designers tend to have a more dehumanized approach, explicitly attending to 'design for manufacturability' (at least, at the more product engineering end of the spectrum), but precisely with the assumption that this is automated factory work, even when the work is done by workers rather than robots.

Most designers encounter their legacy role as the notional head of the division of labor via disputes with clients over cost. Apart from issues of material specification (which have their own internalized labor costs), cost is a proxy for cost of people's time, and losing a battle with a client over cost reductions means that some people are going to be able to make less of a livelihood from this particular (way of realizing the) design. Designers are forever asserting their value in the process of making, even though in the end they are not the makers – there is no completed product as the outcome of the labor of a designer: only plans for more work. The result tends to be a zero sum game with workers: pay the designer more because he will save you money on later production costs.

A last point is that though design has its origin in commanding what workers do, almost no design education I know of, save for those strange post-degree professional courses in how to bill clients, (nor any discourse about sensitive human-centered designing) touches on these human resources issues. It seems to me that every designer

should know in depth the history of industrial relations.

2) **Control of Things**

Designers ascended to the position of managing craft-workers to ensure that things were done efficiently in complex jobs. That efficiency also means getting things right so that they do not have to be done again. The result is that designers are exacting. David Pye characterizes this as a key difference between design, with its machinic commitment to perfection, and craft, with its valorization of the handmade (resulting in unique products each time).

The work ethic of designers is often characterized by their attention to detailing. It is significant that in this era that celebrates designing for being all about quick-and-dirty, low-fi field-testing, Apple (qua Design, as opposed to ‘design thinking’) are proud of their mantra of prototyping at the level of pixel.

3) **Mass**

Bringing an exacting order to larger projects also gave design the capacity to facilitate mass production. Once a design, which includes the design of how that design will be made, is set, it can be reproduced indefinitely. Mass production with respect to materials was occurring before design proper arrived as a discourse, but it should be acknowledged that twentieth century industrialization, especially with respect to consumer products, is the result of the power of design, to create not just styles of products that people would desire, but also the style of production that people could afford – i.e., the cheapness that comes from scale.

Again, contrary to, or at least backgrounded by, current proponents of design thinking, design is the art, or science, or profession, of mass; design might be very good at discerning what appear to be individual needs and desires, but in the end it is the technical skill of aggregating what will satisfy those individuals into the one product reproduced millions of times.

And again, this is not something that is widely acknowledged by design and design education. I have complained previously of the fact that icons of design are invariably single examples of products, whereas in fact, successful designs are never singular but a multitude. A deep-etched image one 1st Generation iPhone upheld as an example of good design, conceals the fact that there were in fact 6 million of them – a very small number compared to subsequent generations of iPhone, all of which remain vastly smaller than the number of Nokia phones sold each day (though perhaps not for much longer). Designers operate at a scale that they have very little capacity to contemplate, let alone take responsibility for. How can you be ethical in relation to 6 million phones, each with over a hundred components and a thousand source-materials?

4) **Principled**

Craft, as characterized in these negative definitions, is something that is embedded in tradition. The way things are done is the way they have always been done. Innovation, if it exists at all in traditional craft practices, is evolutionary: variations occur randomly, without much rationale; the only way to determine their value is by field-tested trial-and-

error. By contrast, design, according to Chris Alexander, is self-conscious. It is the head of the division of labor in order to be a source of deliberation about the best course of action. As a result, it has teachable rationales; if not the scientific rules dreamed of by the design methods movement of the '70s, then at least context-sensitive heuristics, things that can nevertheless be explicated in formal education, rather than mutely mimed via apprenticeship.

This also contravenes the image of design, as intuitive freedom, extolled by design thinking. But the truth is that without some systemizability, if it were only a source of creative flexibility to particularity, design would be of no value to techno-scientific industrial economies.

Designers Visually Plan Making

Etymologically, design means ‘to draw;’ and according to the fable recounted by Alexander and Jones, it was drawing that provided design with the self-consciousness that freed it from craft. Sketching how something was to be made, as instructions to craft-makers, cleared the way for sketching to also be a tool for imagining the form of what was to be made. By using drawing imaginatively, a qualitative rupture emerges in what seemed to be only a quantitative expansion; large-scale craft gives way to design.

Two related constraints of craft are overcome by the drawing that is the basis of designing. The first concerns the trial-and-error development process of craft. Without a realm of imagination, craft makers must make every variation in form to see if it works in a ‘real’ context of application. This makes innovation very slow, because, in addition to having to test every variation at full-scale, only incremental variations are possible (change only one variable at a time). By contrast, design, undertaking ‘virtual’ R&D in the realm of the sketch, can innovate faster: testing is only ever in the imagination or with lowfi rapid prototyping as design thinking advocates; multiple variations are possible (because they can be differentially documented); and big leaps in form, that are not merely random (because there are no documented precedents if not principles), are now possible.

Designers see possibilities as if they were real (the obverse of the point previously made, that designers see the real as perpetually a set of alternative possibilities). A sketch becomes an indexical reference point for whole 4 dimensional reality. Designers are trained to be skilful at mental rotations, taking what is merely a plan of a space or object and see it from: different perspectives – not only from all around, but also from the inside out; and then, in context, abutting other objects, that they may or may not be bonded to, and may even be mechanically interacting with; and then, in use – on or around the body of a person, both a generic body form (human factors), and a particular kind of person, dressed in a particular way, equipped with other objects, seeking to perform a task, alone or with other people (rich picture scenarios of use). All this is what designers are trained to see, and see through their sketches.

Designers Visually Plan Making Things

The Pioneer probe that was slung-shot around Jupiter's gravitational pull into deep space carried a gold plaque with pictures of a (very Western) man and woman, along with the location of earth. We need not fear alien invasion as a result: if extra-terrestrials came to (a Western country on) earth, they would find nothing resembling the pictures in the probe, for that man and woman were naked. Humans are not normally naked. When we are naked, it is mostly because we are 'clothed' by shower curtains and showers; or walls, roofs and bed linen; or legal frameworks materialized as signs that permit nudity on a beach. We humans are be-thinged; we exist mostly, normally, with-things, whether those be garments, bags, phones, cars or cities.

Humans are commonly characterized as symbol makers. (I am fond of Kenneth Burke's definition of humans: "Man is the symbol-using (symbol-making, symbol-misusing) animal, inventor of the negative (or moralized by the negative), separated from his natural condition by instruments of his own making, goaded by the spirit of hierarchy (or moved by the sense of order), and rotten with perfection.") But as Derrida has indicated, before symbols is their materiality. We are symbolic only to the extent that we are memorialists, materializing symbols. In other words, first and foremost, humans are thingly.

But things are uncanny. As physical things, they are there, in front of me, visible, with a resistant hardness. But most of the time they are withdrawn: we store things, dispose of things, lose things, trip over or into things. We depend upon things we do not understand; we cannot explain how things work, or what they are made of, let alone where they have come from, and the consequences associated with their making. We expect things to be permanent, unchanging, yet they are clearly operating on their own material temporality, slowly disintegrating.

This planetary era is increasingly referred to as the Anthropocene. We are remaking the earth with the things that we litter about. As Ezio Manzini has noted, we are semiospheric only to the extent that we attend away from all the things about us. And as Abraham Moles observed long before the internet was developed, we are immaterial (in the realm that Hannah Arendt called action: communicating, learning, planning, politicking), only insofar as all are of our material stuff is reliable. It was Heidegger who had to remind us how we only notice the physicality of all that is about us when it breaks, when this or that tool stops function and suddenly sits in front of us as a stupid mass of matter.

Designers however are very thingly. As makers who experience the world around them as made, and as remakeable, designers notice things. Whilst designers are inherently visual, they are nevertheless still utterly material. I will come back to this below, but it is a truism to say that what defines a designer, of all varieties, is their predilection for noticing the quality of things about us.

But again, designers receive too little education about the temporality of things. Only recent sustainable design courses draw attention, in very technicist ways, to the fact that every thing is merely the temporary accretion of certain materials, all of which have a lifecycle, coming from somewhere (cradle) and are going somewhere (grave).

Designers Visually Plan Making Useful Things

If there are many kinds of makers, the thing that I would insist is ontologically distinct for designers is that they make things that are ‘useful.’ To put it negatively, I think that the power of artworks comes from their insistent uselessness. An artwork is not useful. This is what makes it aesthetic, what removes an artwork from conventional economies. I know that there are artworks that can be used, even artworks that require some kind of use to generate the affect they seek. There is a whole movement of socially-engaged art, the ‘relational aesthetics’ off-shoot of conceptual art, that gets its politics from being useful. However, these are marginal cases, exceptions that prove the rule; or else the use involved is secondary, merely a means not an end. Similarly, there are designs that aim to be artistic expressions, but also secondarily. We judge a design by its usefulness. Philippe Stark’s orange juice squeezer is in the end a much-selling piece of objet d’art because it is in the end quite dysfunctional as a juicer, as a design.

Use is again one of those notions that is so commonplace as to seem everyday. The word lends itself precisely to this meaning: usual. And yet use is conceptually a difficult notion. Consider for example, as some philosophers of design do, whether the uses of this or that thing are inherent qualities of an artifact or merely subjective projections onto things, by users or by designers. When a screwdriver is used to open a paint tin, or a book to prop up a lopsided table, where should that usefulness be situated in the scheme of things? Contemplating these categorical questions has led to an alternative way of understanding human-world relations: ecological perception theory holds that humans do not perceive geometric forms which are then correlated in a computational database with this or that use, ‘Terminator’-style. Rather, humans perceive first action-promises: that thing is graspable, this will take my weight, those will extend my reach. According to ecological perception theory, seeing something is to see yourself already interacting with that thing.

This is also, relatedly, the breakthrough made by the early Heidegger: that primary (though not primordial) is experiencing things-in-the-world as tools, as verbal, as ‘toward’ or ‘for’ some action: things-that-cut, things-for-opening(-and-closing), things-disposed-toward-what-needs-hammering. To discern what Heidegger means – for even though, so the argument goes, this is our ‘natural’ way of being-in-the-world, its nearness makes us miss it, and we are educated to notice only the more scientifically objectifying way for things to be understood – read again Ruth Krauss’ *A First Dictionary*, illustrated by Maurice Sendack: every object is defined by its action-ability: A Hole is to Dig, a lap is to catch crumbs, kittens are to pat, etc.

Being a designer means being attuned to these action-promises. It means focusing on the world as a collection of things that aid or obstruct being-used-for... Designers rate well on creativity exercises precisely because they (counter-)intuitively never see things nominalistically; that is, in terms of what they are called, what they are (known as) in the category of objects. Instead, designers see things always as things-that-can-also-be-used-for-doing-this-or-that. As noted earlier, designers can mentally rotate objects, a feat that makes them good puzzle solvers. But they can also imagine the hand doing the rotation, the person in a situation wanting or needing the object to open up a different kind of action-possibility, the workplace and tasks of the person doing the rotation. This ability to multiply but also concretize use-contexts, to develop rich pictures of use-cases, forever seeing what can be

done, what it is difficult to do, what else is pressing to be done, this is the creativity particular to the designer.

The way designers learn to process these use-imaginings is in relation to patterns, in the post-design methods Chris Alexander sense. A pattern is a network (in Bruno Latour's sense) of behaviors and designs. It is a heuristic connection, a cultural convention, not a determined or biologicistic one. Designers accrete patterns by constantly reviewing precedents, past and present. This is the knowledge-side of designer expertise.

Designers Visually Plan Making Useful Things for People

Because designers design useful things, they are designing things for people. On the one hand, this is obvious; but on the other hand, designers frequently think of themselves only as the makers of things. People will use those things, but for many designers, especially throughout much of the 20th Century, that was secondary. This is why such designers promoted themselves via their products, presented without any people using them, and often without any context whatsoever – just an object on a plinth, or photographed floating against a cornerless neutral background. As noted in the previous section, what is particular to designers is their obsession with things.

Nevertheless, as also noted, it is of the essence of design to be concerned about people-with-things, and contemporary human-centered design research is re-emphasizing the people-side of this equation. Design thinking has foregrounded this reorientation in designing, drawing attention to the empathetic techniques that designers are adapting from anthropology. Businesses, or non-design disciplines, introduce the techniques and/or disposition of designers precisely to better access the particularities of people. (It is embarrassing by the way, at least for those committed to the Enlightenment, that it remains an innovation to get people, whether designers or businesses and even governments, to pay attention to people when trying to generate value – why human-centeredness only now?)

I want to suggest that designers are more empathetic, or empathetic in richer ways, than is acknowledged by the current discourse of design thinking. Designers are not just nice people, paying attention to the needs and desires of others, but professionals with techniques for getting inside how people are in the world, how they go carefully about the world with designed things around them. To explain, I would like to argue that the process of designing is best understood by analogy with theater acting; that the way designers think is very much like the way a performer thinks about a role for which they are preparing.

Harold Nelson and Eric Stolterman claim that essence of design is ‘Being-in-Service.’ A designer serves a client who either will benefit directly from the design, or serves as an initiating proxy for the people who will benefit. But clients do not come to designers with clear problems. If a client can state his or her problem clearly, what he or she or needs is not a designer, but a maker, someone who can merely fill-in the mold created by the negative image of the defined problem. Designers are then not mere problem-solvers, but problem-definers, even problem-finders. They help clients come to understand and articulate the problems that, before coming to a designer, they only feel inchoately. Proof lies in the fact that a defining aspect of the client-designer relationship is the element of surprise, or what Nelson and Stolterman characterize beautifully as ‘the surprise of self-recognition.’ This is the moment at which the designer presents an idea in response to the client’s situation to which the client, ideally, responds: ‘This is exactly what I wanted, and yet did not know that I wanted. How did you come to know me and my situation better than I did?’

This starts to get at the way in which empathy is fundamental to design as its best. Designers do not observe people at distance, or sympathize with the situation they are in, but get on the inside of people. To design-in-service creatively, the designer does not seek merely to identify with the people for whom he or she is designing, mimicking their environments and actions in order to style a product that might fit; rather, like an actor, the designer must appropriate authentically as much as possible of the way in which the people for whom they

are designing exist in the world, in order to be able to improvise how those people would respond to new situations. The designer must become the designed-for, acting in the world in the same manner as the designed-for acts in the world, even in (hypothetically future) circumstances that the designed-for has never been in.

This is why a designer's studio is often not dissimilar to the actors. There are props and costumes, performative games and experiments, auditions and rehearsals, stages and presentations: designers do role-play and body-storming; they write and draw scenarios; they make mood and inspiration boards to keep everyone in character. Playfully inventive design research techniques such as cultural probes speak directly to the fact that designers must try to empathize not with what people are doing, but what they might or could do in unusual situations. Some interaction design researchers, most notably those who use personas, have recognized the connection between acting and design. But this side of the way designers work, is not sufficiently acknowledged when design thinking is mainstreamed as a set of human-centered techniques.

Two supplementary points in passing about the empathy of designers:

1. Elaine Scarry concludes *The Body in Pain: The Making and Unmaking of the World*, with an especially rich account of making that centers on a profoundly empathetic process. For Scarry, making is motivated by empathizing with someone else's pain. Pain is a feeling that demands its removal. This insistence by pain for its removal disables the one experiencing it, but materializes itself as a force to the one empathizing with its experience. It is this externalizing drive of the pain that concretizes it into something like an idea for a pain-relieving object. I do not have time here to explain how this translates to less extreme design situations.
2. As noted above in relation to Donald Schön's account of designing, designers empathize not only with people, but also with what they are designing; they ventriloquize their emerging designs via 'back-talk,' articulating whether the situation in which they are working or the material with which they are working 'likes,' by being surprising or not, the way in which they are proceeding. I will return to this below when discussing the way designers script interactions between people and things.

Designers Visually Plan Making Useful Things for Sets of People

Although design is what I have called ‘the art or science of mass,’ bringing together a knowledge of manufacturing – designing the efficient exact reproduction of a product – and a knowledge of markets – designing a form that will appeal to, and be usable by, as many people as possible – it is not possible to design for all the people all the time. One of the errors of the modernism that was the birth of contemporary designing was that it believed in the existence of universal forms, whether mathematically aesthetic universals following Ancient Greek geometry or natural universals as dictated by the ‘form follows function’ dictum of evolution. In hindsight, it is clear that there are not universals that fit everybody, but only forms to which people can more or less be made to fit; modernism is a kind of violent imposition upon different kinds of people, an attempt to uni-form them into supposed ideals of the ‘modern human.’

But nor is designing the one-by-one fabrication of bespoke artifacts, such as craft artisans tailor for their sponsors. Design designs for sets of people at a time: not everyone but also not individuals; rather groups or classes of people. Sometimes these are called market segments, or user groups. The point however is that design caters to sets of people in particular times and places; and establishing what that set is, its characteristics and so size, is a crucial component of design, one that again is too often occluded by the way design thinking thinks about design research.

At the heart of design is therefore a dilemma. If, as the previous section argued, empathy is axial to how designing happens, how do designers empathize with a number of people at a time? The very essence of empathy is that it be individuated, authentically connecting with what some particular person feels. To put the issue another way: how do designers move from research into set of people to some particular design, some individual concrete proposition that hopefully caters to a range of individuals. Designers might have their own ways of doing research, but they must also have their own ways of interpreting research, operationalizing anthropological, psychological or sociological reports, not just turning those research reports from retrospective accounts of people into prospective ideas for the futures of those people, but also turning those generalized findings into this or that selected option.

The recently promoted design method of ‘personas’ is a good way of understanding how designers negotiate this dilemma. A persona, as invented by Alan Cooper, is an accretion of empirical research of a set of people into a single person. That person is an invention but has the same kind of believability as a fictional character in a novel that is based upon the amalgamated characteristics of a few real people. So here is the designer moving from generalized social research to a concretized particular. Designers working with personas create an inspiration board depicting this persona – their biography and tastes and habits, etc – and place this board in the design studio or at design meetings, effectively ‘consulting’ the persona about his or her views on what is being designed. This ventriloquizing of the persona requires precisely the acting skills discussed in the previous section. Through this feedback, the design team creates a design that should be ideal for that individual persona; but because the persona is an accretion of a set of people, it should also serve the needs and desires of all of those people. Personas are only a heuristic, not a guarantee; they are only ever as good as the research on which they are based, the creativity that converts that research into an individual, and the improvisatory skills of the design team to bring the fictional persona to life

in the design context. But they are a rich example of the issues that lie at the heart of the thinking that designers do when designing.

A more generic way in which designers negotiate people collectively is in regard to ‘taste.’ It has always struck me as strange that when people talk about designers with a view to extracting from the practice of designing something like design thinking they fail to note the most obvious thing about designers: that they are obsessed with the look of things, of their things and of others’ things, and that they are forever making pronouncements on what things are and are not tasteful (beautiful, cool, elegant, well-designed, nice, quality, stylish, timeless, etc). This aspect of designers is a cliché – e.g., “The Devil wears Prada” – but this does not lessen its significance for understanding the nature of designing. Tastes, as the sociologist Pierre Bourdieu has most comprehensively explained, are crucial forms of social language, ways in which people make judgments about each other. What films or food someone likes tells me something about their level of wealth and education, about their cultural background and means of livelihood and aspirations. What initially seems like a purely subjective like or dislike by this or that person is in fact something a take as a marker of the type of person they are, the social group that they feel comfortable in. Tastes are not how we distinguish ourselves individually, idiosyncratically, but rather an idiom, how we align ourselves with a group: liking this or that means that I am like the set of people who like this or that. In this Bourdieusian context, being concerned about taste, about what is and is not tasteful to who, is not just a pretension who happen to also be designers, but a crucial aspect to designing. It is via being taste literate that designers negotiate groups of people rather than individuals. Of course, designers often seem judgmental about tastes, and clearly have strong taste regimes of their own, ones that Bourdieu would argue are decisive to how all sets of professionals distinguish themselves as that kind of professional; but when combined with the previous design thinking capacity – empathy – it should be apparent that an expert designer is someone who can ‘bracket’ their own tastes, and deeply experience the taste collections of others, of clients and users, even to the extent of being able to predict new styles of things that those kinds of people would enjoy.

Designers Visually Plan Making Useful Things for Sets of People in Situations

In the dialectic of this presentation on design thinking, we have been shifting between things to people. It is perhaps necessary to reassert, given the previous section's focus on style and aesthetics, the practical focus of design. When designers design for sets of people with shared taste regimes, this is not merely a selling strategy. Designers, qua design, are not focused on rousing affects or giving pleasure. Theirs is not a purely aesthetic practice, like art, or a merely persuasive practice like marketing. As claimed earlier, designers make useful things; not just things that are usable, but things that will be fully used because they meet a need, one often not initially recognized as a need. The nature of what is designed, its look and feel, but also its functions and locations, is – at least for design at its best – more determined by the situation for which it is designed than it is for the purposes of just selling this or that widget. There are two ways to explain this further:

1) To say that designers design for sets of people in particular situations means that designers think of people as practitioners. People undertake activities; part of living is to do things, not just own pleasing things. Designers research people trying to do usual activities. Along the way, they notice things getting in the way of those people trying to accomplish this or that aspect of their everyday lives. They then design things that would be useful to people doing those kinds of things, taking into account what those people in those partly obstructed situations find tasteful. The result are designs that help people with the practical aspects of day-to-day life, products that make people's situations more efficient, or productive, or enjoyable; less frustrating or tiring.

Sociologists have recently begun to notice that this way of looking at people, as doers-of-things, is quite distinct – very different from the way of looking at people as calculative optimizers or even rational action planners. The 'practice turn' in sociology amounts to thinking that the basic unit of society is not an individual, distinct from the built environment and its infrastructures and products in which they dwell, but a 'practice;' that is, a semi-conscious activity that involves the convergence of a person with certain skills, devices that accomplish certain actions, and meanings that are attached to certain results. Practices tend to be best captured by verbal nouns, ending in 'ing:' laundering, cooking, commuting, dressing for going out, skiing, listening to music, etc. Importantly, successful practices are situations that do not require fully conscious decision-making; practices involve discrete actions that are so chunked together by practitioners that those doers often have difficulty articulating each of the actions involved (as when they need to teach a novice how to undertake a practice like doing woodwork or accessing illegal copies of television programs on the internet). This is why I am calling these practices situations. Designers are often called to design something for a situation precisely because the people practicing that situation are no longer able to do it merely semi-conscious ways. Because there are obstacles in the situation, they are being forced to think carefully each time about how to do what they want to do, strategizing a workaround, and putting in more focused effort. It is the designer – with an eye for an elegant practice, a practice that has been parsed into a neat ensemble that is pleasurable precisely because it no longer requires laboriously detailed attention – who re-situates a situation, making things that make those situations once again useful practices.

2) A situation, as the account of practices just given indicates, does not comprise only people; it involves things, devices, products that only work to help somebody do something in that situation because they are themselves situated within larger systems. Tools need to be located in the right kind of environments to operate, connected to sources of power, associated with other tools and materials and processes. No product ever functions alone. A toaster requires bread and electricity to function; it also functions best if there is butter and jam, and a knife and plate; it can function, but not very well, if it is in a room other than a kitchen, or outside of a building, etc. A famous design maxim is: always design something in the context of its next larger system; a chair in a room; a room in building, a building in a city; a city on an earth, etc. Designers have started referring to this network of products and systems that enable any one of one product to do what it has been designed to do as a ‘product ecosystem.’ To design something for people that might make the situations of practice those people find themselves in more fluid and less self-conscious also requires designing something that fits with the product ecosystem that will be its niche. A design’s function and style are not only about it being compatible with its human users, but also about it being usable by all the systems to which it will connect and the devices alongside of which it will do its job. The human-centered focus of design thinking tends to miss this aspect of designing. But the singular-decontextualized-product that designers display in their portfolios also tends to downplay this ‘environment of things’ that makes up the situation that any designer is designing (for).

Designers Visually Plan Making Useful Things for Sets of People in Situations

Perhaps the most profound conundrum that surrounds design is the fact that icons of design, classic examples of ‘good design,’ are very visible, very physically present. They are displayed in magazines and award ceremonies and museums, on a few lucky people’s mantle pieces and in books on everyone else’s coffee table. And yet, everyday good design is very invisible, very absent, precisely because it becomes transparent to whatever practice it is making possible. A well-designed chair will not look out of place in an office; it will invite you to sit without you having to think about where it is or how to use it; and then it will not make its presence felt for however long you sit in it. Only a poorly-design chair is noticeable, either sticking out as a misfit in a room, or forcing you to adjust your position as it pains your backside after 15 minutes. Good design disappears, which is perhaps why designers and design museums need to make such a big thing, literally, of any ‘classic design.’

For this reason, I have crossed-out ‘Things for’ in the title of this section: designers make things, they visually plan the making of material objects, but those designed things, insofar as they are useful to sets of people, in the end withdraw into those only-ever semi-consciously practiced situations; they lose their thingness, and begin to feel immaterial as the actions that they enable become what their designed-for sets of people attend-to.

However, the sentence can be read in another way after the ‘Things for’ is removed: Designers make useful sets of people. As I said earlier, designers are always designing for people. But they are also always more or less designing those people as well. There are 3 levels to this designing of people that designers do:

1) At the least, when a designer makes a useful thing, the people who buy and use that thing have been indirectly designed by the designer inasmuch as they are now people who do what the designer made possible. To be used regularly, people must adjust, making a time and place for that new design in their lives, learning how to use it and how to let its use become habitual. The designer can design this adoption of a new innovation, or the designer can just leave it up to the user, but either way, the designer has effected a change in people’s lives. At this level, designers design people by making things easier or more desirable; people can resist, but in general people will do what is more efficient or pleasurable. The designs therefore have the pull of what appears more convenient.

2) To be useful to a designer, a design must get a user to interact with it in the right way. This is clear when thinking about digital interaction devices: a smart phone can only access the internet for someone if that person presses the right buttons in the right sequence, after setting up the whole device in the correct way that gives it access to the internet. A well-designed device guides people through its use, training users in the most efficient ways of calling up the device’s various functions. But in fact all designs do this ‘instruction’ of their users. A chair only provides comfort to someone if that person sits in the chair the right way. Consequently, any designer must design the chair such that the best way to experience how the chair has been designed to function is immediately apparent: the level of the seat and its size, as well as its materiality, should all communicate, ‘place your behind here (and not there, or there, etc).’ Less successful designs tend to communicate explicitly, with signs for examples. Better design uses affordances to signal from thing to body, bypassing the need for

rational decoding. The latter are designs that we refer to as more intuitive. Importantly, at these times, these designs are coming close to designing people, structuring not-necessarily-conscious behaviors toward these devices. Useful designs have this capacity; or, we let designs have the capacity to design us because of the usefulness that comes from being designed by a design.

3) There is an emerging field of work sometimes called ‘behavior-steering design’ or ‘design with intent’ (the latter is Dan Lockton’s phrase for his PhD research in this area). This work seeks to use designed artifacts explicitly to structure certain human behaviors. The strongest examples are designs that deliberately exclude and even punish people; but others are designs that make one set of activities easier and another much more difficult – people can resist, but have to go out of their way to do so.

So designers in designing people also have a certain power of people. This is something that design thinkers, in their commitment to liberal human-centeredness do not like to admit. Design thinking aims to be a source of creativity in management, not an extension of its history of control. It is also something that designers disclaim: the modernism from which design emerged was explicit about its agenda to restructure not just how people lived, but the very nature of what it meant to be a modern human. This project was erroneous, and when it did manage to design people, the results were not desirable. So design tends to have a strong reaction to anything that appears to recall the determinist behaviorism of its past. Nevertheless, designs do design their users, and so the designers of those designs have a power for which they must be responsible.

Designers Visually Plan Making Fruitful People

The emphasis on the useful so far has the danger of instrumentalizing design. Design has always straddled between being a creative art and a technological problem-solving. There are perhaps two ways of looking at this ‘straddling,’ one strategic and the other philosophical:

1) The being-in-service of designing suggests that it is closer to problem-solving than the affect creation. However, as noted above, designers tend to do more problem-defining as problem-solving. Designers for example can problem-dissolve through problem-redefining, as in the famous example given by Bryan Lawson in *How Designers Think*, where an architect struggling to come-up with a council-approvable renovation to a house has a meeting with the client at the house, whereupon he realizes that the problem is less the need for more space and more the need for sound-proofing the parents from their music-loving son – the solution is a no-build option: a pair of head-phones for the son. It is precisely this lateral approach to problem-solving that leads to the hiring of designers by companies to help with more amorphous problems like strategic direction planning. Design thinking as a business innovation process is the result.

As has been noted in passing, another crucial aspect to designing is that it is a problem-finding process. Its research explores situations with which people are currently coping, but which the creativity of the designer can envision as occurring in less painful or effortful ways. As a result, the design is innovative in that reframes a situation as problematic in the absence of the new designed thing. This means that the designing does not proceed as in the way problem-solving does, from a problem to solution. Quite the reverse, in some ways design can be understood as making makes problems where there were not ones. Great design is when you start using a new product and then retrospectively wonder how you ever coped with that kind of practical situation without that product. These kinds of reframing disruptions tend to require a creativity that we do not normally associate with instrumental problem-solving.

2)

Problem-solving vs innovating

Technology as survival vs beauty

Designers World-Make

What designers don't do:

Designers cannot design things that are unfinished