Materialization of the speculative in foresight and design

by
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Abstract

At the intersection of the disciplines of design and futures, a set of practices are currently emerging whose key feature is the creation of material representations of speculative future worlds. These practices go by various names, including “design fiction”, “artifacts from the future”, and “experiential futures”. This work inquires into the methodological possibilities offered by these practices by investigating the ways in which they are being employed by current practitioners. Five instances of practice were analyzed in depth, primarily through practitioner interviews, in order to construct a taxonomy. While the practices differ in significant ways, they were found to share some key attributes; in particular, they act to enhance our capacity to seek out and work with possibility, enrich communication in the exchange of speculative ideas, disrupt conventional mindsets with provocative visions of alternative futures, and affirm individual agency.

Acknowledgments

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Finally, I wish to thank the practitioners and thinkers who made this work possible by graciously agreeing to be interviewed: Julian Bleecker, Stuart Candy, Jake Dunagan, Anab Jain, Nicolas Nova, Miriam Simun, Scott Smith, and Bruce Sterling.

Table of Contents

List of Tables

List of Figures and Illustrations

1 Introduction

At the intersection of the disciplines of design and futures, a set of practices are currently emerging whose key feature is the creation of material representations of speculative future worlds. These practices are emerging concurrently in different guises and by different names, depending upon particular disciplinary perspectives. In the world of design this kind of work is often described as "design fiction", a term that science-fiction author and design theorist Bruce Sterling explains as "the deliberate use of diegetic[1] prototypes to suspend disbelief about change." (Candy 2011) Those in the futures domain are more inclined to speak of "artifacts from the future", or "experiential futures". Regardless of the terminology used or the disciplinary perspective taken, what these practices have in common is the manifestation of elements of speculative future worlds in material forms.

The emergence of these practices, and the increasing amount of discussion around them in the design and futures literatures, suggests that materialization of the speculative offers new possibilities for inquiring into, exploring, understanding and designing possible futures. At the same time, one might ask in what ways they are truly distinct from existing practices. Hasn't design always been engaged with the creation of material representations of speculative future

[1] A "diegetic prototype" is a prototype that exists within a diegesis – the internal fictional world of a story. See Kirby 2009.

worlds? Designers create models and prototypes – are these not material representations of speculative worlds, namely the very world in which the modeled or prototyped artifact has come into being? And hasn't foresight, at least since the advent of scenarios methods, been making use of speculative future story-worlds to explore possible future realities? Perhaps these emerging practices can be understood as a synthesis of scenarios and prototyping, yet it is far from clear what such a synthesis implies.

The objective of this research was to undertake an open-minded inquiry into the methodological possibilities offered by these practices by investigating the ways in which they are being employed by current practitioners, focusing in particular on the following questions:

- Why the emphasis on material representations in particular? Why not represent these worlds in stories told through written narratives or film for example? In what ways are material representations of particular use in exploring, understanding and designing possible futures?
- What are the key motivations underlying these practices? What are practitioners hoping to achieve?
- Where do these practices fit within the larger domains of design and futures[1]? How do they differ from more traditional design prototyping

[1] The terms “futures” (or “futures studies”) and “foresight” are used interchangeably by many authors. In this document, “futures” is generally used to refer to the “the multidisciplinary and systematic field of inquiry of probable, possible and preferable futures” (Milojevic 2002), and “foresight” is used to refer to the practice of applying futures thinking towards the development of insight about futures in a specific context.

practices, and from other kinds of speculative designing such as “critical design” (Dunne [1999] 2005)? How do they compare with other foresight methods, as enumerated for example in Popper's Foresight Diamond (Popper 2008)?

- Why are these practices surfacing now? What is it about the current moment in the disciplines of design and futures that welcomes or perhaps demands what these practices have to offer?

In order to answer these questions, a broad literature review was undertaken, followed by an in-depth investigation of a select group of five instances of practice, conducted primarily through practitioner interviews. The results of these investigations were used to construct a taxonomy, comparing and contrasting the practices from the perspectives of process, product, intended audience, and underlying motivations.

This work did not aim to comprehensively cover the entire landscape of emerging practices engaged in creating material representations of speculative future worlds, as there are many more practices and practitioners than could possibly have been included in a research project of this size. However, the combination of a careful selection of representative practices for in-depth study, and the interpretation of those results within the context established by the broader literature review, provides confidence that the picture drawn here is a sound reflection of the broader phenomenon.

2 Background

In Section 1 it was stated that the set of practices of interest here are currently emerging at the intersection of the disciplines of design and futures. This section sketches out the background of these emerging practices from the perspective of each discipline separately.

2.1 Materialization of the speculative in design

Materialization of the speculative has been at the heart of the discipline of design since its very inception. This has often taken the form of a prototype – a representation of a design idea created for the purpose of exploring design problems, evaluating potential solutions, and enabling communication about the problem and solution within a design team or to a given audience (Houde and Hill 1997). A prototype acts as an embodiment of the design, and often functions as an aid to further uncover user needs (Suchman, Trigg and Blomberg 2002). Prototyping is for many designers the primary activity of design (Saffer 2009).

However, design has traditionally focused on the resolution of immediate problems at hand, as is evident in Houde and Hill's conception of a prototype, which presumes a design *problem* for which a *solution* is sought. Designers have not traditionally been tasked with – or offered the role of – designing for

future worlds that differ very much from the world of the present. In light of this, the set of practices of interest here can be distinguished from more traditional design work simply by their emphasis on speculative future worlds, as opposed to the resolution of problems in the present.

It was suggested in section 1 that the term “design fiction” is often used to distinguish this more speculative category of work from plain old design. The term “design fiction” is relatively new.[1] It seems to have made its first appearance in Bruce Sterling's work from around 2005-2006 (see Sterling 2005, 2006b), but to have only come to prominence in 2009 with the publication of two pieces: Julian Bleecker's essay entitled “Design Fiction: A Short Essay on Design, Science, Fact and Fiction” (Bleecker 2009), and Bruce Sterling's article in ACM Interactions magazine entitled “Design Fiction” (Sterling 2009)[2]. Bleecker's essay, inspired by the writings of Paul Dourish on the influence of science fiction on ubiquitous computing (e.g. Dourish 2009), describes design fiction as practice concerned with designing for possible near futures rather than for the present, and with a concomitant focus on the sociocultural context and experience of a designed artifact – the story around it – rather than simply the artifact itself. Just as narrative science fiction has enabled the exploration of possible futures

[1] The term is new as a category of practice. The phrase “design fiction” used descriptively is found earlier, e.g. in Dunne [1999] 2005 p. 64.

[2] Sterling's early (e.g. 2005-2009) usage of the term “design fiction” refers to written work rather than to a material design practice. He later indicated that he is no longer in favour of using the term in this manner: “Nowadays, I think that it muddies the water to claim there's any kind of written fiction called 'design fiction'.” (Sterling, personal communication 2011)

without regard for current technological limitations, design fiction, the essay suggests, enables a similar exploration, but on a tangible, experiential level. Design fiction artifacts are "objects that help think through matters-of-concern … materialized thought experiments." (Bleecker 2009:83) They are materialized for purposes of thought, reflection, and discussion – they play a discursive role.

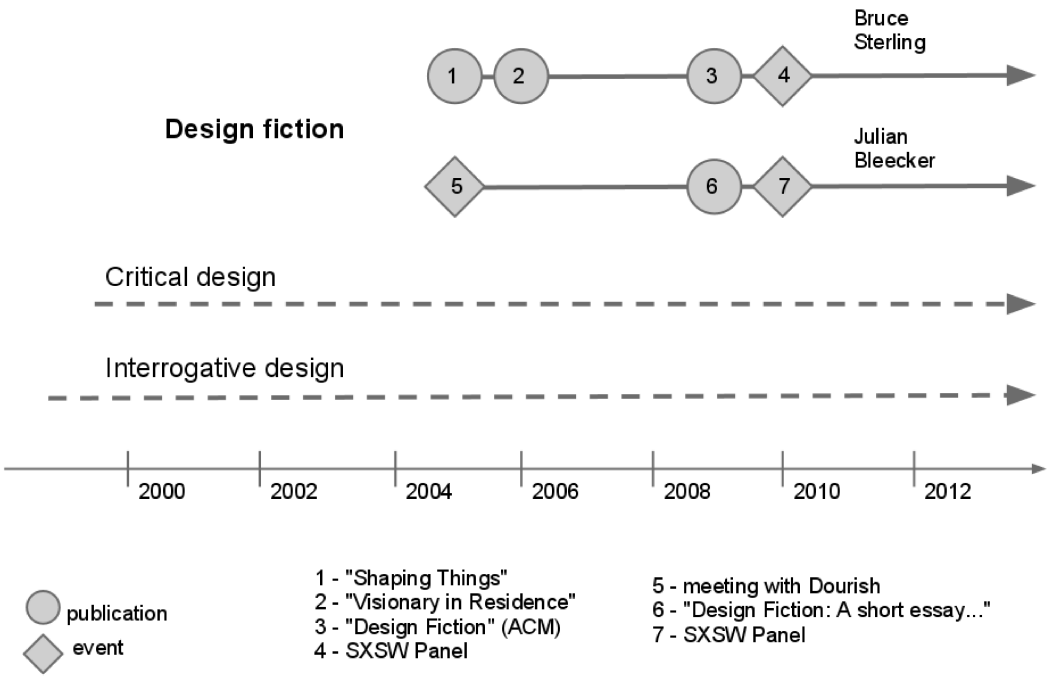

Figure 1: Timeline: materialization of the speculative in design.

Figure 1 illustrates some significant markers in the evolution of design fiction prior to 2010. As of 2010, the frequency of references to the term "design fiction" in the design literature and at design-related conferences has increased dramatically. For example, Grand and Weidmer have written about design fiction as an approach to design research in which possible futures are "explored, tested, evaluated and improved through a constant attempt to materialize their

central features." (Grand and Weidmer 2010:10) Dingwall et al. have spoken to the need for design fiction as a critical and reflexive tool to investigate problem framings in their Digital Economy research program (Dingwall et al. 2011). Manos has taken the idea of design fiction into the world of business, calling for "fictional entrepreneurship" (Manos 2011). Vande Moere and Hill have written of their experiences using design fiction as method in the context of teaching an Urban Computing design studio (Vande Moere and Hill 2009). Designer Branko Lukic has published "Nonobject", a book of speculative design artifacts (Lukic and Katz 2010). Brian David Johnson, futurist at Intel Corporation, has published a paper describing the use of "science fiction prototyping" as a design method at Intel (Johnson 2009), and subsequently a full book on the method (Johnson 2011). And a panel, organized by Bleecker and entitled "Design Fiction: Props, Prototypes, Predicaments Communicating New Ideas" was held at the 2010 South by Southwest conference (Bleecker 2010).

Given this surge of interest in design fiction, two questions beg to be explored: Is design fiction really a new thing, or is it a new term for an old thing? And why has there been such growing interest in it within the past several years?

Whether or not design fiction is an entirely new thing, it is far from unique among design practices whose output functions primarily as a "materialized form of discourse" (Maze and Redstrom 2007:9). It is part of a long tradition of what has variously been termed speculative or conceptual design and includes specific

practices such as “critical design” (e.g. Dunne [1999] 2005), “interrogative design” (Wodiczko 1999), and going back further in time, the anti-design movements of the 1960s and 70s (Maze and Redstrom 2007).

As for why there has been such an increase of interest in design fiction of late, three observations will be noted here. One is the expanding role of design itself. Whereas the discipline of design used to focus solely on the creation of objects (industrial design) and communications (graphic design), its role has expanded to encompass the design of services and experiences (Sterling 2006a). Moreover, it is increasingly experimenting with its role in raising public awareness of important issues and enabling political action, as noted by DiSalvo:

> Since the late 1990s, there has been a proliferation of [design] projects that examine and experiment with the capability and role of design in increasing societal awareness, and motivating and enabling political action. … making visible and known the complex situations of contemporary society, so that people might take action on those situations... (DiSalvo 2009:48)

A second observation is that the tools and materials of design have become increasingly available and accessible to non-specialists. Not only can anyone create and manipulate virtual artifacts – text, images, audio, video, and software – using everyday digital technologies, but the advent of technologies like the open-source Arduino microcontroller and 3-D printing are increasingly enabling non-specialists to create sophisticated material artifacts as well. The ability to participate in the domain of material creation seems to bring with it a sense of empowerment. As Tester has noted, “Driven by democratic media and open

platforms, more people see themselves as potential agents of influence and change." (Tester 2007) A third observation, which comes from Sterling, is the increasing ease with which design fictions can be circulated (Sterling, personal communication 2011). As noted above, design fictions are created primarily for discursive purposes. Clearly, the circle of discourse is limited to the network in which the artifact – or at least a representation of it – circulates. The internet – and particularly the rich media internet that has come of age only in the last half-decade or so – has been instrumental in enabling the sharing of design fictions, through images, video, and perhaps even source-code or blueprints, among a much wider network than would have previously been possible.

In short, these three factors – the expanding role of design, the increasing accessibility of tools for creating and participating, and the increasing ease with which design fictions can be shared, discussed and debated – have contributed to a growing sense that design is a serious force for the shaping of collective futures, and a corresponding growth in the desire and ability to participate in that process. The creation and and sharing of design fictions is one means of broadening that participation, and this suggests a possible, if partial, hypothesis for the current interest in the subject.

2.2 Materialization of the speculative in futures

Materialization of the speculative has historically been absent from foresight methodology, and indeed from futures studies as a whole. This isn't surprising, given that the futures field has been concerned primarily with conceptual entities such as events, trends, forces of change, and images of the future, unlike design which has always been concerned with the material world.

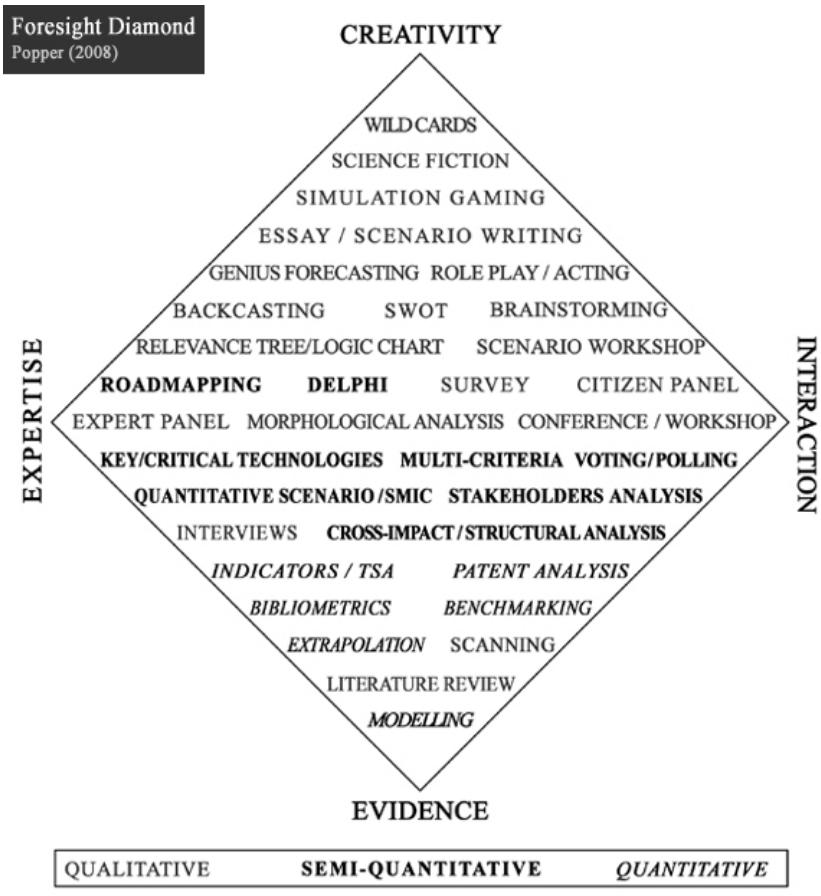

Figure 2: The Foresight Diamond (Popper 2008)

Popper has organized foresight methods according to what he terms their *capabilities*, defined as “the ability to gather or process information based on

evidence, expertise, interaction, or creativity." (Popper 2008:65) He has illustrated this visually with the Foresight Diamond (figure 2), in which 33 common foresight methods are positioned spatially within a diamond according to the degree to which they rely on each capability. Note that there are no methods referring explicitly to the materialization of speculative worlds. The closest entries would seem to be *science-fiction*, *essay/scenario writing, scenario workshops* and *role-play/acting*, which could presumably involve the use of material props. The question of where materialization of the speculative should be located in the Foresight Diamond will be revisited in section 4.3.

It was not until 2006 that concrete evidence of experimentation with methods based explicitly on the materialization of speculative worlds first surfaced. At this point in time, references to the term "artifacts from the future"[1] began to appear in blogs (e.g. Pang 2006) written by staff at Palo-Alto's Institute for the Future, a non-profit futures think tank and research centre. In a 2007 blog entry, Jason Tester of the Institute for the Future described how the Institute had been experimenting throughout the past decade with different media for sharing futures forecasts, including "artifacts from the future" and the use of "experiences that immerse participants in future life" (Tester 2007). He has called for the creation of a more systematic approach to creating and evaluating the effectiveness of

[1] *Wired* magazine had been running a back-page column entitled "Found: artifacts from the future" since 2002, featuring photographs of speculative future artifacts. However, the Pang 2006 blog post is one of the earliest indicators of this concept being adopted as a method by a formal foresight research group such as the Institute for the Future. The entire *Wired* series is available on Stuart Candy's blog (see Candy 2008).

various media in communicating about futures, proposing a discipline of "human-future interaction" (ibid).

Also in 2006, Stuart Candy and Jake Dunagan, then graduate students at the Hawaii Research Centre for Futures Studies[1], in conjunction with their professor Jim Dator, staged the now well-known *Hawaii 2050 kick-off*, involving four "futures rooms", each room a physical incarnation of a scenario (Candy 2006). This workshop allowed participants to experience four very different versions of Hawaii in the year 2050. Candy later went on to formalize this approach under the name of "experiential futures", elaborated most fully in his doctoral dissertation (Candy 2010). It is noteworthy that Candy cites the influence of both critical design and design fiction in the development of his work.

Figure 3 illustrates some of the significant markers in the evolution of materialization of the speculative in futures up until about 2010. As in the case of design, the question that begs to be asked is why all of this has come about in the past half-decade or so. Taking note of some broader trends that have been underway within the futures domain may help to shed light on this question.

[1] Part of the Department of Political Science, University of Hawaii at Manoa.

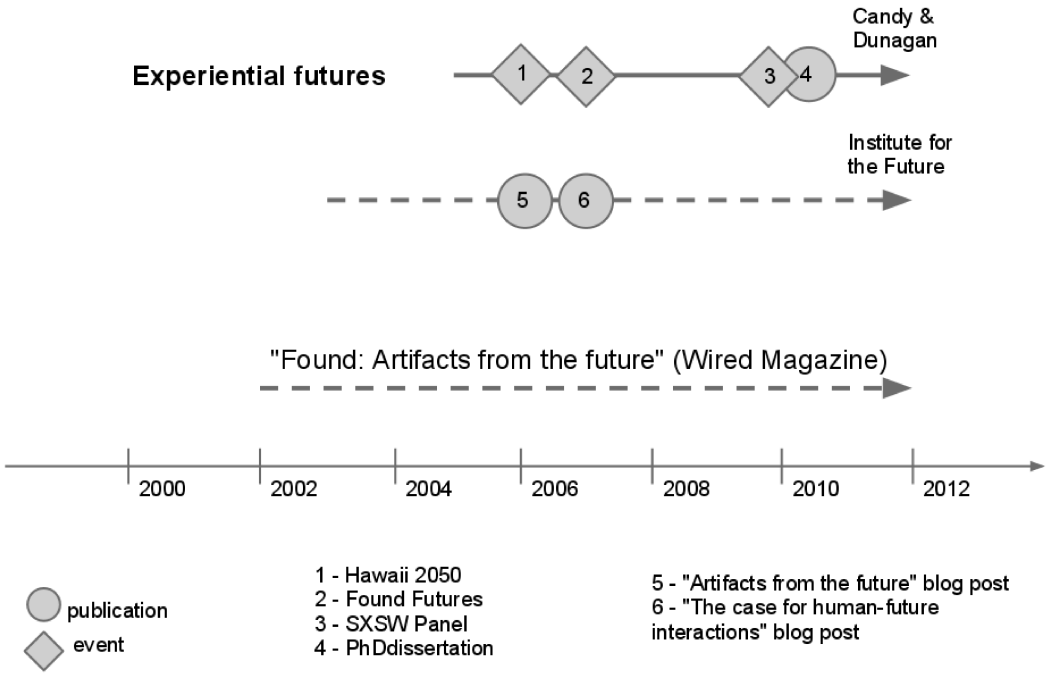

Figure 3: Timeline: materialization of the speculative in futures.

Foresight as a discipline emerged in Western industrial society in the latter half of the 20th century. Its initial concern can be described as the anticipation of the future in the service of national strategic interests, such as the need for military security, the need for commercial strategies to ensure economic prosperity, and more recently, the need to understand and mitigate emerging social and environmental problems (Milojevic 2002). Given these origins, the discipline inherited, unquestioningly, many of the intellectual traditions of the Western industrial world, including an epistemological basis in scientific prediction (ibid).

In the intervening years, some important shifts have occurred in the discipline, driven in part by a growing sense that humanity is facing unprecedented global

challenges that threaten the survival of the entire species, and that cannot likely be resolved through the continued application of science and technology alone. There has been a growing appreciation for the role played by culture in both understanding and creating the future. In her work on systems thinking, Meadows (2008) has suggested that one of the greatest leverage points for creating change in a system is to change the paradigm – the "shared social agreements about the nature of reality" (p. 163) – from which the system arises[1].

Recently, Ruben Nelson of Foresight Canada has called for a "foresight 2.0", the distinguishing feature of which is an element of reflexivity towards culturally-ingrained understandings and epistemological assumptions. Whereas "foresight 1.0" remains "trapped in the unconsciously accepted understanding of reality and societal project of the culture in which it is practiced" (Nelson 2010:31), foresight 2.0 seeks "to see and critique the underlying assumptions of our own culture and those of others" (ibid), and even "the deepest assumptions of human culture and consciousness"[2] (Nelson 2010:25). The need for this reflexivity stems from the complexity of present day challenges and the impossibility of simply rectifying the situation without evolving deeper cultural paradigms:

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[1] According to a note from the editor that appears in the book, a draft was completed in 1993, hence Meadows' thinking predates the publication date of the book by at least 15 years.

[2] Nelson notes that "To date, no society has been able to adapt to changes in its context that are profound enough to require it to consciously change its most fundamental understandings of the earth and the human place in it, including its foundational frames of reference. None has learned to see, think and act in ways that lay beyond its inherited culture." (Nelson 2010:4)

> ...the emerging strategic conditions of the 21st Century require us for the first time in history to develop the capacity to engage consciously in the evolution of existing human cultures, including their most fundamental frames of reference. (Nelson 2010:3)

According to Nelson, the development of foresight methods like Causal Layered Analysis (CLA) are encouraging signs of the emergence of foresight 2.0.

It is worth considering CLA, and the ideas of its creator, Sohail Inayatullah, a little more closely here. Inayatullah has proposed a typology of the futures discourse which divides futures into three categories: the predictive, the cultural, and the critical. The predictive is concerned with anticipating the future, primarily through analysis of trends and events. The cultural is concerned with recognizing the existence of other cultures' worldviews and allowing these to inform futures thinking and practice. The critical is informed by poststructuralist thought and is concerned with deconstructing the present – asking how the present has come to be what it is – and in so doing, suggesting possibilities as to how the future might be otherwise (Inayatullah 2004). Inayatullah locates CLA within the critical, and to a lesser extent, the cultural perspectives, stating that its utility lies "not in predicting the future but in creating transformative spaces for the creation of alternative futures." (Inayatullah 1998)

In the ideas of these thinkers lies a possible explanation as to why the materialization of the speculative – and design in general – has found its way into the domain of futures. What Meadows, Nelson, and Inayatullah (among others)

point to is an expansion of futures thinking from a narrowly rational and scientific enterprise concerned with anticipating change in an exogenous world, to include a more reflexive and critical stance concerned with investigating cultural understandings and assumptions about the nature of "the future" and the role of foresight practice itself. As Nelson put it: "we must reformulate foresight to reflect what we are coming to know about the character and requirements of a social constructivist epistemology." (Nelson 2010:33) From constructivist epistemology comes the belief that human reality is, to a large extent, an ongoing creation of the collective human mind, shaped by language and culture. From this perspective, it hardly makes sense to stand back and attempt to anticipate the future without acknowledging our role in creating it, and to do this is to acknowledge that futures can to some extent be designed. It follows naturally that methods relevant to design are at least somewhat relevant to futures, and materialization of the speculative – construed as the extension of prototyping into the realm of the speculative – seems particularly appropriate.

2.3 Summary

Sections 2.1 and 2.2 provided a brief outline of the evolution of practices concerned with creating material representations of the speculative, in both the world of design, where the description "design fiction" seems to be gaining currency, and in the world of futures, with the emergence of terms such as "artifacts from the future" and "experiential futures".

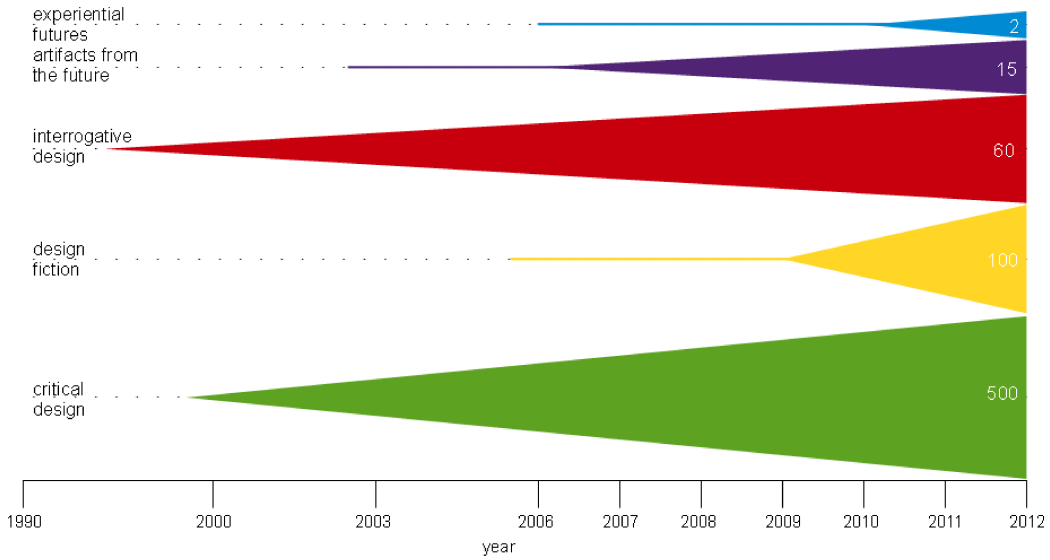


Figure 4: Bibliometric analysis of terms related to materialization of the speculative.

Figure 4 summarizes this evolution from a bibliometric[1] perspective, and includes the terms “critical design” and “interrogative design” for purposes of comparison. The very simple bibliometric analysis presented here illustrates two things: the point in time at which a term first appeared in scholarly literature, and the relative frequency with which that term is found now in a literature search. The analysis is based on data retrieved from the Google Scholar[2] search service. Triangles begin at the point in time where a term first appears in the literature, and the width of the triangle at the right edge illustrates the relative frequency of that term

[1] Bibliometrics is a quantitative research method drawn from information sciences, where statistical analysis of content and citations are used to understand the flow of ideas through scholarly publications (for more on bibliometrics, see for example Diodato 1994).

[2] Google scholar search is located at http://scholar.google.com/.

in the literature at present. A thin line precedes a triangle where it is known that the concept was under active development at the time, even if the term had not yet appeared in publications. One of the challenges with using Google Scholar to conduct a bibliometric analysis is that a search can yield many false positives. In particular, searching for the term “critical design” yielded many results that were unrelated to the notion of critical design that is of interest. In order to overcome this, it was necessary to measure instead the number of citations of two works – Dunne ([1999] 2005) and Dunne and Raby (2001) – that serve as key references for the term. In general, the numbers on the right of figure 4 should be regarded as *estimates* of the *relative* frequency of each term only, and not as absolute measures or as having any absolute meaning.

The bibliometric view makes clear the relatively swift growth in the use of the term “design fiction” over the course of the past 2-3 years, supporting the hypothesis that design fiction is currently emerging as a new category of practice within design. In contrast, the terms “artifacts from the future” and “experiential futures”, even taken together, do not show the same level of adoption, suggesting that materialization of the speculative still plays a smaller role in the discipline of futures studies than it does in the discipline of design. This isn't surprising, and in fact confirms the hypothesis that materialization of the speculative represents quite a nascent methodology in the futures domain.

The terms “materialization of the speculative” or “material representations of the speculative” will continue to be used to refer to these practices as a group throughout this document. In addition to being practice-agnostic and free of extraneous connotations that the other terms may bring with them, use of these terms emphasizes the aspect that unites all of these practices for the purposes of this study. It also reserves the other terms for use in referring unambiguously to their respective practices.

3 Research design & methodology

The approach taken with this research was to develop a taxonomy of practice by combining general knowledge of the field, acquired through literature review, with an in-depth analysis of a small number of specific practices, based primarily on practitioner interviews.

3.1 Literature review

The starting point was to review the existing literature on the specific practices of interest (e.g. design fiction, experiential futures), including anything that practitioners themselves had written about their work. This was supplemented with a review of specific elements drawn from the broader disciplines of futures studies, design studies, and the humanities. Within futures studies, the main area of interest was the tension between analytical and constructive approaches, evident in the work of authors like Nelson (2010) and Inayatullah (2004) (both discussed in 2.2) and Richard Slaughter (1995). Areas of particular relevance within design studies included prototyping (e.g. Houde and Hill 1997; Saffer 2009; Suchman, Trigg and Blomberg 2002) and critical design (e.g. Dunne [1999] 2005; Dilnot 2008; Maze and Redstrom 2007), as discussed in 2.1. Wicked problems (e.g. Rittel and Weber 1973; Buchanan 1992) were also of interest, given that speculative worlds are, by nature, highly indeterminate design contexts. Because writers in design and futures studies often cite more general

work from the humanities, a review of some of this work was also required. Topics such as semiotics, poststructuralism, and social constructionism were of particular importance.

3.2 Practice Analysis

Five specific practices were analyzed in-depth, based primarily on interviews with the practitioner(s). Table 1 lists the practices that were analyzed.

Practice	**Practitioners**
Design Fiction	Julian Bleecker, Nicolas Nova, co-founders of the Near Future Laboratory
Design Futurescaping	Anab Jain, founder and director Superflux
Experiential Futures	Stuart Candy, Jake Dunagan
Creative Disruptions	Miriam Simun
Future Fabbing	Scott Smith[1]

Table 1: Practices studied

3.2.1 Practice selection

The following definitional criteria were used to select the practice sample to study:

[1] Scott Smith served as both an interview subject and an advisor on this project. The interview was conducted prior to his tenure as an advisor.

1. The practice produces material artifacts that represent speculative future worlds.

2. The artifacts are employed to evoke, explore, communicate about, or inquire into some aspect(s) of the speculative world in question.

In addition, the sample was bounded by logistical considerations which determined that a maximum of 8 interviews could be conducted within the time and resource constraints of the study. For this reason, practices were carefully selected based upon reputation and access, and also to ensure a diversity of perspectives.

Julian Bleecker and Stuart Candy were obvious candidates for starting points, as they are arguably the individuals most strongly associated with the terms “design fiction” and “experiential futures” respectively (as discussed in section 2). In addition to their more academically directed writing, both have written extensively about these concepts on their respective blogs[1].

Nicolas Nova and Jake Dunagan were selected based on their associations as collaborators with Bleecker and Candy respectively. Nova and Bleecker co-founded the Near Future Laboratory, their “design-to-think collaborative studio”, according to its website[2]. Nova is also a co-founder of the LIFT[3] conferences

[1] Julian Bleecker blogs at http://www.nearfuturelaboratory.com, and Stuart Candy at http://www.futuryst.com.

[2] http://www.nearfuturelaboratory.com

[3] http://www.liftconference.com

which have been something of a gathering point for people interested in design fiction (Smith, personal communication 2011), and is a respected voice in the digital technology/interaction design community[1]. Dunagan and Candy have worked together on several experiential futures projects including the aforementioned *Hawaii 2050 kick-off*, and Dunagan is currently a research director at the Institute for the Future[2]. Furthermore, there are connections between Candy/Dunagan and Bleecker/Nova. Candy has acknowledged Bleecker's influence on his work (Candy 2010), and both Candy and Dunagan appeared on a panel organized by Bleecker entitled “Design Fiction: Props, Prototypes, Predicaments Communicating New Ideas”, held at the 2010 South by Southwest conference (Bleecker 2010).

Both Anab Jain and Scott Smith are connected to the Bleecker-Nova-Candy-Dunagan network in various ways, including through participation in the LIFT conference. Jain is the founder and director of the London-based Superflux[3] design practice, which consists of both a client-facing consultancy and a research lab for exploring more speculative design concepts. As a graduate of the Design Interactions program at the Royal College of Art, headed by Anthony Dunne, Jain presumably brings an element of Dunne's critical design perspective to her work. Smith is a consulting futurist with a background in business forecasting, and the founder of the consultancy Changeist[4], a “foresight and strategic design lab”. His

1 Nicolas Nova blogs at http://liftlab.com/think/nova.
2 http://www.iftf.org/user/958
3 http://www.superflux.in
4 http://www.changeist.com/

practice differs in an obvious way from the others, in that it is a workshop-based practice where the workshop participants are the ones who do the making.

Miriam Simun is connected to the network through Smith, the two having met at a conference. A recent graduate of New York University's Interactive Telecommunications Program, Simun[1] is perhaps most well-known for her controversial *Human Cheese* project (see section 4.1.4). Simun is somewhat of an outlier with respect to this sample. It could be argued that her practice does not strictly meet the definitional criteria stated above because she does not view her work as explicitly concerned with "the future". The speculative worlds she creates do not rely on speculative technology that may or may not come to exist, and therefore she considers them equally valid as representing alternate presents (Simun, personal communication 2011). Nonetheless, there is no reason not to treat an alternate present as a possible future. From this point of view, Simun's practice does meet the necessary criteria, and her inclusion expands the breadth of the sample right to its definitional boundary.

Figure 5 illustrates the diversity of practitioners' educational and professional backgrounds. Approximately half of the sample comes from a more design-centric background and half from a more futures-centric background. Similarly, about half have completed doctoral-level education, and half have complete bachelor or masters-level education.

[1] http://www.miriamsimun.com/

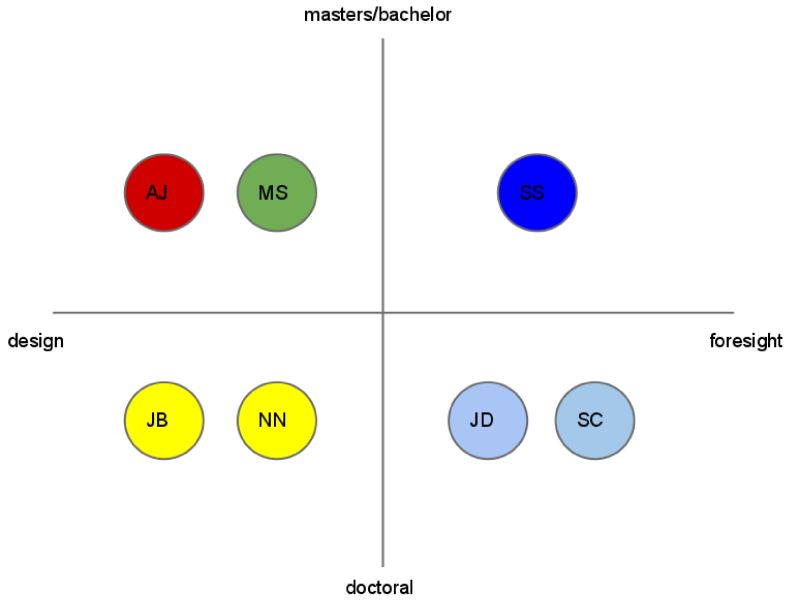


Figure 5: Diversity of practitioners' educational/professional backgrounds.

Other practitioners that were considered for interviews include Anthony Dunne and/or Fiona Raby, Steve Lambert and Anne Galloway. Dunne and/or Raby would have made ideal additions to the sample, as their inclusion would have allowed critical design to be considered in far greater depth. Lambert is a conceptual artist who was involved with the "New York Times Special Edition" project (discussed further in 4.1.3). Galloway is an academic who leads the Design Culture Lab[1] and is involved in critical and speculative design. Unfortunately none of these individuals were available for interviews within the study period.

[1] http://www.designculturelab.org/, based in the Faculty of Architecture and Design at Victoria University of Wellington.

3.2.2 Interview design & data analysis

Practices were analyzed from four perspectives – *product, process and roles, motivations, and intended audience* – described in table 2.

Perspective	Description
Product	What does the practice produce? What form/media do these products take, and why?
Process and Roles	What process does the practice follow, and what are the roles of various actors, as producers and consumers of the work, within this process?
Motivations	What are the motivations behind the practice? Why did practitioners initiate the practice? What do they hope to achieve?
Intended Audience	Who do the practitioners see as their intended audience? Who are they attempting to reach?

Table 2: Four analytical perspectives

Interviews were designed to cover the practice from these four perspectives. A topic guide was prepared which established the core set of topics to be covered. From here, a basic pool of questions was established, forming a generic interview protocol (see Appendix A). The generic protocol was then tailored for each practitioner.

Rather than adhere strictly to the established set of questions, interviews were performed in a semi-structured manner, allowing emergent themes to arise and be freely pursued during the course of the interview. Where possible, questions

– especially those occurring at the outset of the interview – were phrased so as to avoid certain assumptions about the practitioner or the practice. Specifically, interview questions did not assume that the practice was fundamentally concerned with the creation of material representations of speculative future worlds, or assume anything about the uses of the produced artifacts. In this way, the interviews could be used to validate the inclusion of the practice in the study with respect to the definitional criteria.

The first and most basic stage of analysis involved summarizing the interview data in the form of a matrix, using the topic guide to form the rows, and the interview subjects as columns, similar to what is suggested by Gaskell (2000). This helped to quickly establish a sense of the overall breadth of responses and the relative position of each practitioner within the sample.

Further analysis was performed using *thematic coding*, where codes are applied to passages of text to indicate thematic content (Gibbs 2008). An *open coding* process was followed, wherein the interview transcripts were coded based on an emergent coding scheme developed iteratively throughout the process of coding. The resulting set of codes was then used as input to an affinity grouping exercise, whereby the codes were laid out on a two-dimensional surface so as to reflect thematic associations in their spatial arrangement. The resulting “theme maps” yielded clusters of codes representing an emergent set of higher-level themes which then served as a framework for further analysis and discussion

(figure 6). A distinct theme map was generated from each of the four perspectives. These are displayed throughout section 4.2 in conjunction with the related discussions.

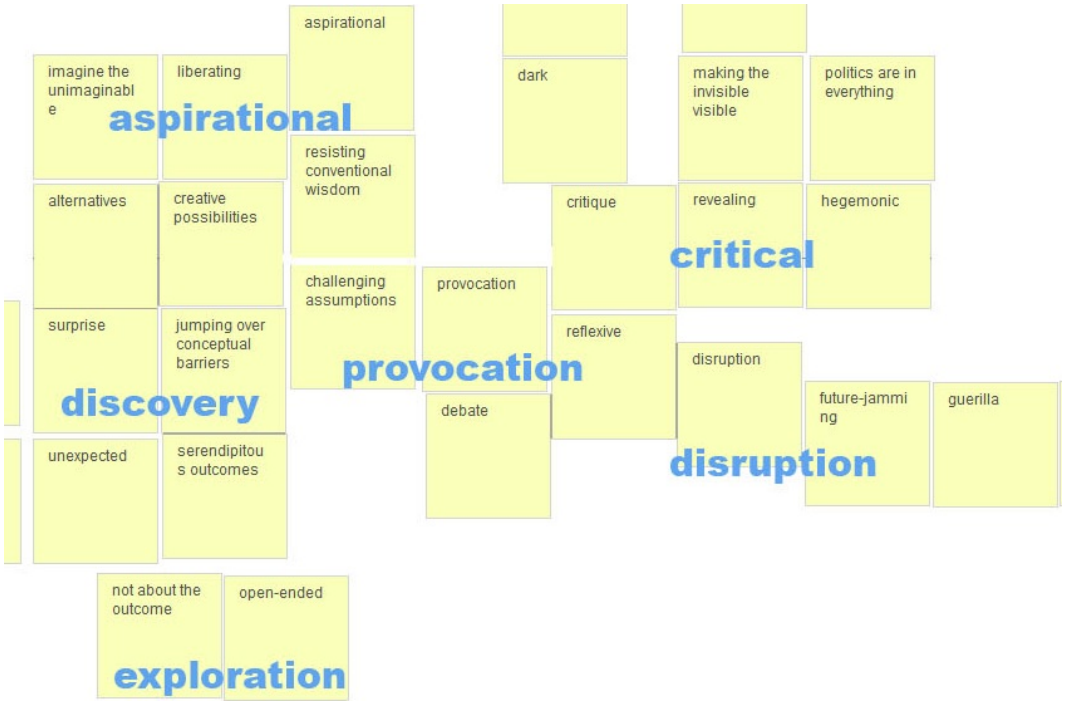


Figure 6: Example of a "theme map" in development.

4 Results

4.1 Practice profiles

This section presents an account of each practice as understood through the practitioner interviews, framed in terms of the four perspectives outlined in section 3.3. Quotations from the interviews are used liberally to support the accounts[1]. In some cases, practitioners' written work has been used to supplement or clarify the understanding. Note that each practice is handled separately here – all comparative analysis is deferred to section 4.2.

4.1.1 Design Fiction – Julian Bleecker & Nicolas Nova

Overview

Design fiction, as conceived of by Bleecker and Nova, co-founders of the Near Future Laboratory, draws together design, science-fiction, and science-fact in the service of imagining alternatives to the current outputs of commercial industrial design practice. Assuming a critical stance toward mainstream technological innovation, the practice seeks to "expand the range of possibilities" (Bleecker) beyond what is typically available in the commercial design context; to "invent

[1] For the sake of readability, the source of each quotation is usually not stated explicitly. All quotations are drawn from the personal communications listed in Appendix B unless otherwise indicated.

alternatives to the … objects, artifacts, services and devices [seen in] the media...” (Nova).

The practice itself centres around the creation of “material representations of possible futures” (Bleecker), generally in the form of working prototypes of technological artifacts that might exist in such futures. These artifacts play several roles: they act as props, yielding insight into the techno-social aspects of the future worlds they represent; they inspire discussion and debate about these futures and the implications of technological and social change; and they act symbolically, disrupting comfortable and conventional ideas about technological innovation and “the future” with alternative visions.

Design fiction is heavily inspired by the literary genre of science fiction. Bleecker cites the work of Paul Dourish – who investigated the role played by science fiction in unconsciously establishing the research agenda for the field of ubiquitous computing – as a foundational influence. According to Dourish, “science fiction does not merely anticipate but actively shapes technological futures through its effect on the collective imagination.” (Dourish 2009) It seems that design fiction intends to play a similar role.

Product

The Near Future Laboratory, with its focus on digital technology, emphasizes the creation of working prototypes of digital artifacts, as for example with *Slow*

Figure 7: The Near Future Laboratory's Slow Messenger (2007) receives text messages and displays them one character at a time. The rate at which the message is revealed is influenced by the amount of time the device is held, and the amount of time it is carried while walking. (photo: Bleecker 2007b, creative commons)

Messenger (figure 7) and *PSX* (figure 8). As Nova explains, "... we try to do things concretely with the clay of the 21st century..." and he provides two reasons for this. The first is that building things is an important part of their design process (see Process and Roles below). The second reason is that putting working prototypes in users' hands helps them to understand how people will use a technology, how they might re-purpose it, and what broader social implications it might have – resulting in a feedback loop that may lead to new design possibilities or entirely new directions. Bleecker echoes these thoughts: working prototypes are a means of getting people engaged with thinking about an

artifacts' context of use and inciting discussion about the design possibilities. And having users experience an object and reflect on that experience yields further input to the design process. As he describes it, with a tangible object, "...people linger more, they wonder about something that's sitting in front of them, and they pick it up and turn it around and do something with it, and whatever they're doing continues the discussion."

Process and Roles

Design fiction is not so much a practice distinct from design itself as it is "another way of doing design" (Bleecker). Bleecker and Nova follow a design practice that seems to be heavily influenced by the thinking and methods currently popular in the broader discourse of design, and human-centred design in particular. There is an emphasis on making, rather than simply creating blueprints: "The building of it... actually wiring things up and making things … that's as much part of the design work as any other part … because things happen in that process, decisions get made..." (Bleecker). The process is exploratory and open to serendipity: "You encounter certain kinds of problems, but those problems can be seen as constraints to create … new elements, new functionalities … to create something really different than what you had in mind at first..." (Nova). And the focus is user-centric, informed by user observation, as indicated by Bleecker's desire to "... focus attention on what people are doing and how they're doing it and how we can make that better...", "... just focusing more on people and their experiences and things they do with the objects around them..." as opposed to

doing technological innovation for its own sake. Foresight methods also play a role, as the front-end of their process is informed by weak signals of change. As Nova explains, “There are signals about … futures, about possibilities, technical possibilities, social change, and we wanted to start from this [sic], analyze those signals...”

As far as roles are concerned, the Near Future Laboratory appears to be simultaneously the producer and the primary consumer[1] of its work. Nova suggests that the Near Future Laboratory can be viewed as a “think tank” that allows he and Bleecker to work on projects that interest them, independently of more client-driven work they may take on in other contexts. While some of their work does end up being exhibited in galleries and at festivals (the project *PDPal*, for example, has been exhibited numerous times between 2002 and 2011, at locations including the Whitney Museum of American Art in 2003 and The Banff Centre in 2004), much of it is not exhibited in any form other than the documentation on the Laboratory's website.

Motivations

According to Nova, the purpose of the Near Future Laboratory is to produce artifacts that play a similar role to science fiction: “It’s a way to embed ideas about the future in an artifact [instead of] in a narrative...”. Their work is driven by

[1] This depends on exactly how consumption is defined, and whether viewing of the work over the internet is considered a means of consuming the work. This is discussed further in section 4.2.2.

a critical stance towards mainstream notions of progress in the realm of digital technology, an interest in creating and circulating alternative possibilities, and a desire to engage in active creation of the future.

For Bleecker, the critical aspect is directed toward what he refers to as the “up-and-to-the-right graph of progress”: “The ‘up and to the right’ thing is my point of view to say that smaller, faster, more or different colors … are not innovations - they don’t really make things better..." Nova frames it as the “memes”, “tropes”, and “stereotypes” of science fiction - “the videophone, the flying cars” - and the role these play in establishing the set of targets for engineers and others involved in technological development:

> What I found a bit sad here is that it’s just as if there were no other alternatives that could be explored, understood, tried out, just to see if the future can [sic] be different … that maybe the ideas and tropes that emerged out of science fiction were one thing, and there could be others.

And yet the Near Future Laboratory is not anti-progress: “It’s not that I don’t want things to get better, but I want to understand what those measures of better are.” (Bleecker)

They characterize the success of their work mostly around the extent and quality of discussion and debate that a project inspires among the practitioners and others exposed to the work.

> … If everybody’s happy about [the outcome], it means that perhaps we failed, because it doesn’t raise any questions or … help to discuss potential futures in a disruptive way. (Nova)

Disruption features strongly in Bleecker's account as well. In his words, the Near Future Laboratory is about being "provocateurs", "disruptor[s] of conversations". Nova puts forth another criteria, which could be refered to as emotional resonance, "that it echoes with peoples feelings when they see it..."

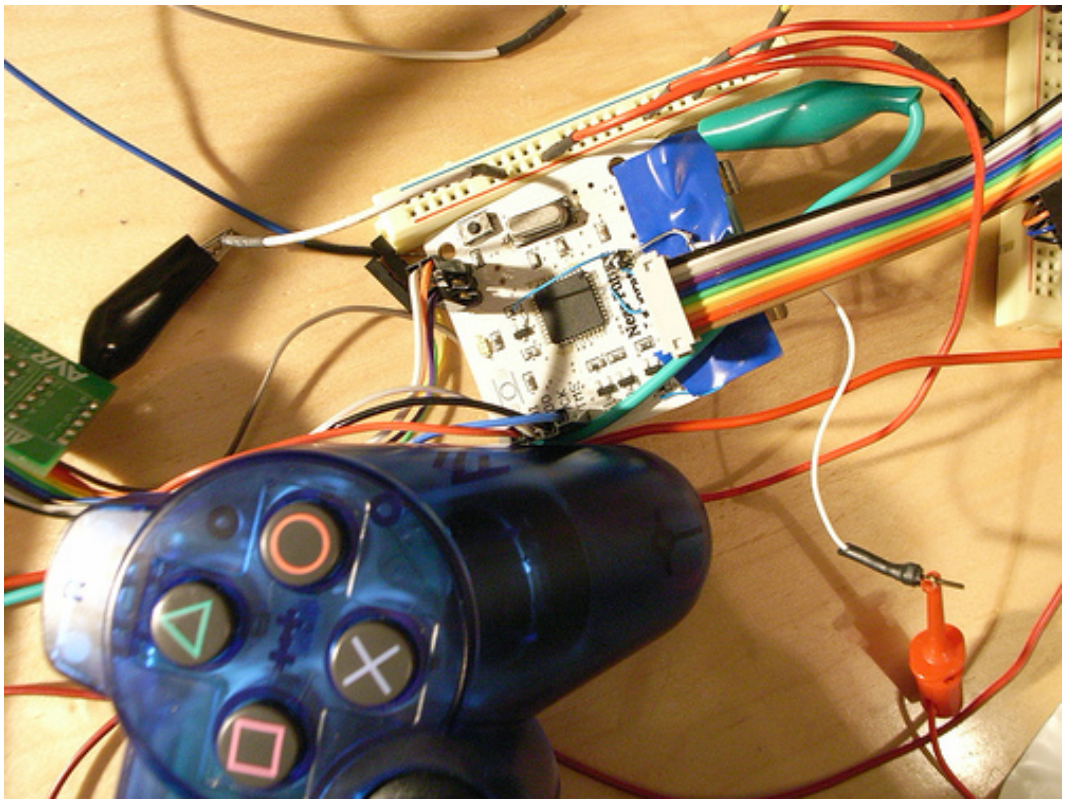


Figure 8: The Near Future Laboratory's PSX game controller (2007) must be "fueled" by real-world physical activity before it can be used to play video games. Fuel is then consumed by game play, causing the controller's responsiveness to deteriorate. (photo: Bleecker 2007a, creative commons)

Intended Audience

According to Nova, the target audience for their work is primarily experts of various stripes: designers, futurists, academics, and open-minded entrepreneurs

and innovators with an interest in the near future, who know that “it’s important to look at the fringes and to look at things that don’t fit to see that certain kinds of patterns [or] signals can emerge out of it [sic]...”.

4.1.2 Design Futurescaping – Anab Jain

Overview

As noted in section 3.2.1, Jain is the founder and director of the London-based Superflux design practice. “Design futurescaping” is the term that Jain and Superflux have invented to refer to their methodological approach. Like design fiction, design futurescaping draws on science-fiction, and in particular its “tactics for cognitive estrangement”[1] such as the “novum” (Jain, Ardern and Pickard 2011:6).

Product

Within the speculative arm of its practice, Superflux is interested in creating alternative visions to those produced as the status quo of mainstream commercial design. These visions are rendered in the form of tangible artifacts, prototypes, films, maps, and montages, where the choice of medium depends on

[1] "Cognitive estrangement" refers to literary scholar and science fiction critic Darko Suvin's characterization of science fiction as "a literary genre whose necessary and sufficient conditions are the presence and interaction of estrangement and cognition..." (Suvin, cited in Clute, Langford and Nicholls 2011). By "estrangement", Suvin means something like Bertolt Brecht's *Verfremdungseffekt* (ibid), sometimes translated as the *estrangement effect* or *defamiliarization effect*, an artistic device by which the commonplace is made to appear strange or unfamiliar.

Figure 9: Superflux's 5th Dimensional Camera (2010), based on the "many worlds" interpretation of quantum mechanics, is a proposition for a camera that simultaneously captures the same instant in many parallel universes. (photo: Superflux, used with permission)

the parameters and objectives of a project. Jain notes that films are helpful for reaching a wide audience, but for work that's going to be exhibited, there's a strong preference for tangible objects: "... it's nice to have a physical object that helps people enter this world, because it's immediate, it's tangible..."; in presenting a future world, "tangible touchpoints" are important. In reference to their recent project entitled *5th Dimensional Camera* (figures 9 - 10), which attempts to present Hugh Everett's "many-worlds theory" and the ideas behind quantum computation in a manner that is accessible to the public, she explains: "a project around quantum physics is so abstract … we needed something that would get children interested in physics..." and evoke in them a strong sense of wonder.

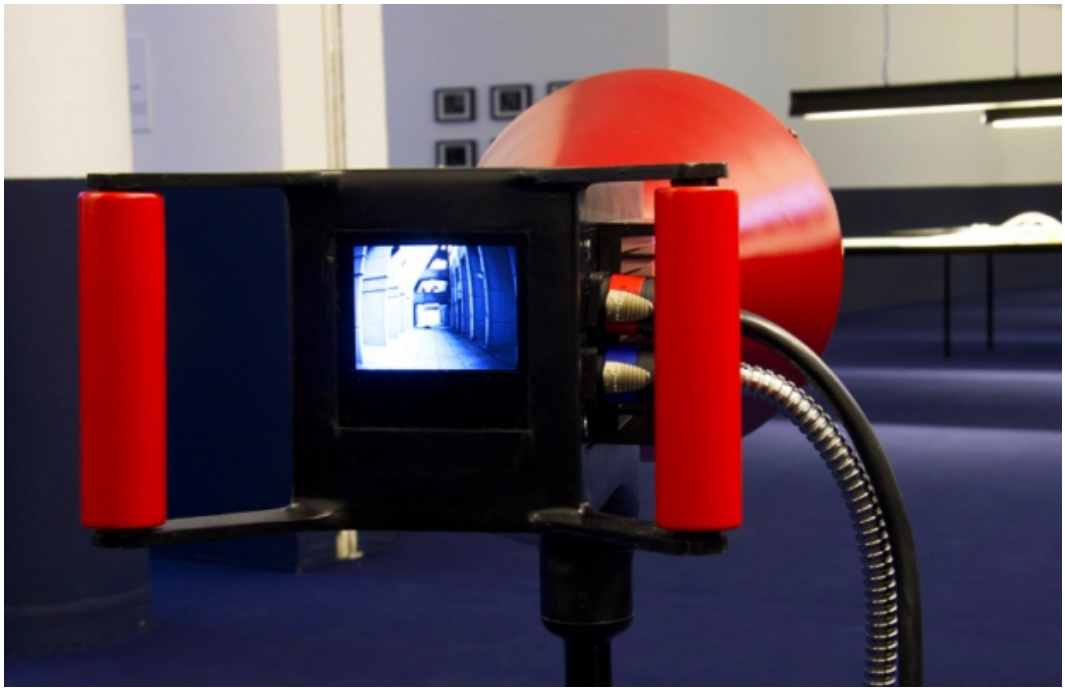


Figure 10: Superflux's 5th Dimensional Camera (2010), as seen from behind the camera. (photo: Superflux, used with permission)

Process and Roles

Jain describes design futurescaping as “a set of tools” that includes storytelling, co-creation and collaboration. Many of their projects have included an element of public engagement, where they have invited stakeholders to participate directly in the design process, using methods such as collaborative annotation and Lego prototyping (Jain et al. 2011). Jain notes that the act of making helps individuals, particularly non-designers, to move out of their personal world and achieve the suspension of disbelief required to enter into a collective imagined future: “I think if you’re not … someone who’s used to thinking about the future as a collective future, then it’s very difficult to suspend disbelief and enter that collective future

without being involved in it." Many of the projects documented on the Superflux website have been exhibited in gallery settings, which suggests that they produce work with the intention of it being consumed by an external audience.

Motivations

Like Bleecker and Nova of the Near Future Laboratory, Jain assumes a critical stance towards conventional thinking about technological development, and speaks of a desire to create alternative visions. According to Jain, "there's a slightly dark side to this whole thing … a deterministic view of the world...", characterized by a "business as usual, consensus future created for the benefit of all" and "most of us have bought into it". In response to this, the practice aims to "open up the world to new, more exciting possibilities", "possibilities which may not have been considered before."

Jain acknowledges that "we're not here to save the world..." but stresses their general desire to create "positive … alternate futures". She hopes that their work will, perhaps slowly and over the course of time, exert an influence on the popular conception of the future and its possibilities, particularly in the minds of other designers. By creating and demonstrating alternative possibilities, she hopes other designers will be encouraged to develop reflexive and critical capacities toward their practices and the way those practices might perpetuate the "consensus future": "As designers you are taught to be serving the market …

and by creating different possibilities [we] are hoping that more designers … are questioning their own practice...".

Jain also expresses an interest in shaping the journey from science to technology. In reference to their project entitled "Song of the Machine", on which they collaborated with a scientist, she explains "it's very exciting if we are able to shape something [e.g. scientific knowledge] before it becomes technology."

Intended Audience

According to Jain, the target audience for their work is primarily other designers, whom she hopes to get "questioning their own practice" - and here she cites critical design as a point of reference. She also hopes that eventually they might be able to influence key decision-makers – for example, those in the public and private sectors embarking on new projects in areas such as urban-planning and smart cities – to consider new possibilities.

4.1.3 Experiential Futures – Stuart Candy & Jake Dunagan

Overview

Candy and Dunagan's work, which they term "experiential futures", is about enabling people to experience, as directly and fully as possible, what it might be like to live in a given future world. Experiential futures – described by Candy as a

"methodological kit" - is intellectually rooted in futures studies. Candy and Dunagan developed experiential futures in response to what they perceived to be the limitations and outright failings of more conventional foresight methods that have been developed over the past half century or so. Dunagan expresses a sense of frustration with foresight's history of "communication failures". For Candy, the field has yet to "really [make] a mainstream impact on how the proverbial man in the street thinks about the future", and this represents the failing of the larger project of future studies to "improve futures thinking in the public mind".

The solution that experiential futures offers to these shortcomings lies in taking futures methods and their outputs out of the realm of written scenarios and analytical reports and into the realm of experience and the senses; to engage both sides of the brain, rather than only the left. "Experiential futures is the idea that people will think about the future better if they have some experience with it … it's very important ... to speak to their emotional and visceral registers..." (Dunagan)

Product

While standalone artifacts are produced in some cases, such as with the *Found Futures* postcard project (see Candy 2007a), Candy and Dunagan often strive for more immersive experiences – the archetypal example being the *Hawaii 2050 kick-off* (figure 11). The ideal is to immerse the subject as fully as possible in the

Figure 11: Four "futures rooms" from the Hawaii 2050 kick-off (Candy and Dunagan, with Jim Dator 2006). Each room is an "experiential scenario" - a theatrical incarnation of a possible future. (photos: Candy 2006, creative commons).

experience of a speculative world (the question of what is meant by "immersion" is taken up further in section 4.2.1). Dunagan explains that, while they ultimately translate the world into representative artifacts, it is the world that is primary: "... we're basically creating [the] world in which it exists first, and then building the artifact out of that."[1] Depending on the parameters and objectives of a project, the rendering of this world may include tangible objects, printed media, film, and live theatre to further elaborate the scenario. The goal is simply to make the most

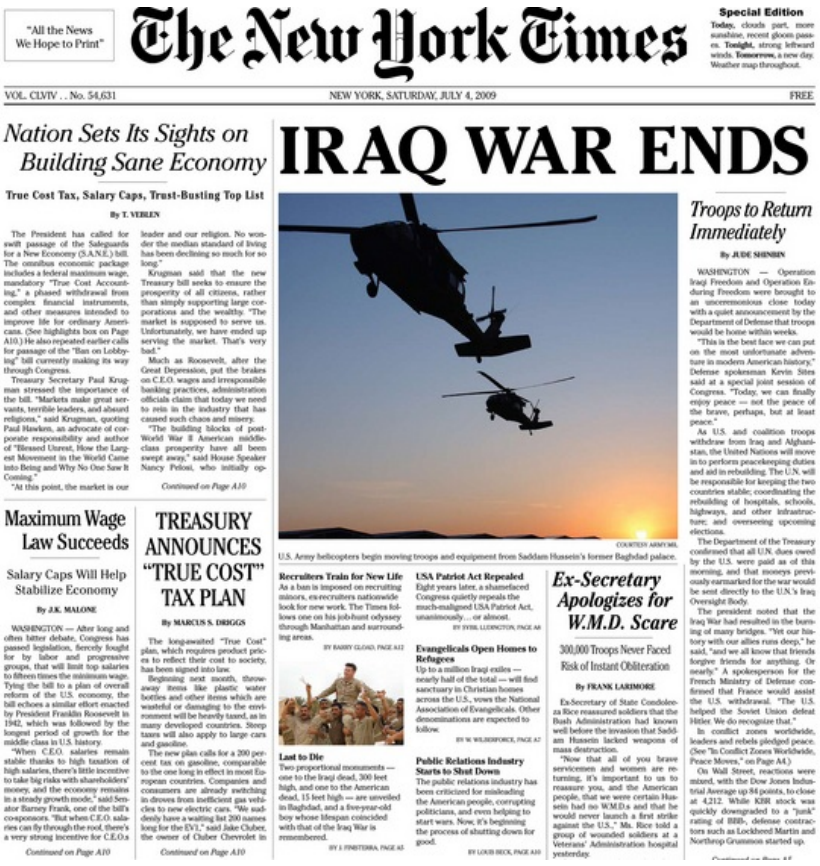
[1]Note that the word "artifact" seems particularly appropriate in the context of experiential futures, in that it emphasizes both the archaeological aspect - a human-made object characteristic of a particular cultural and historical moment - and the incidental aspect - the notion that it is a by-product of the world from which it emerged.

economical and effective use of various media to evoke the salient aspects of the world in question.

Figure 12: As part of Candy and Dunagan's Found Futures: Chinatown project (2007), posters appear in a shopfront announcing the arrival of Starbucks in Honolulu's Chinatown. The posters are a ruse, an "experiential scenario" exploring a possible near future in which Chinatown falls prey to corporate development interests. (photo: Candy 2007b, creative commons).

Some of their work, such as the *Found Futures: Chinatown* project (figure 12), is so seamlessly embedded into the real world that it borders on hoax and might be considered a form of "culture-jamming" or "future-jamming". Culture-jamming is a term that originated in mid-1980s, and that describes "an insurgent political movement [that] seeks to undermine the marketing rhetoric of multinational

corporations, specifically through such practices as media hoaxing, corporate sabotage, billboard 'liberation', and trademark infringement.” (Harold 2004:190) Future-jamming expresses a similar notion, except its target is not consumer culture but rather the dominant images of the future that saturate mass media and tend to represent rather narrow interests (Ramos 2006).



"All the News We Hope to Print"

The New York Times

Special Edition

Today, clouds part, more sunshine, recent gloom passes. Tonight, strong leftward winds. Tomorrow, a new day. Weather map throughout.

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Nation Sets Its Sights on Building Sane Economy

True Cost Tax, Salary Caps, Trust-Busting Top List

By T. VEBLEN

The President has called for swift passage of the Safeguards for a New Economy (S.A.N.E.) bill. The omnibus economic package includes a federal maximum wage, mandatory "True Cost Accounting," a phased withdrawal from complex financial instruments, and other measures intended to improve life for ordinary Americans. (See highlights box on Page A10.) He also repeated earlier calls for passage of the "Ban on Lobbying" bill currently making its way through Congress.

Treasury Secretary Paul Krugman stressed the importance of the bill. "Markets make great servants, terrible leaders, and absurd religions," said Krugman, quoting Paul Hawken, an advocate of corporate responsibility and author of "Blessed Unrest, How the Largest Movement in the World Came into Being and Why No One Saw It Coming."

"At this point, the market is our leader and our religion. No wonder the median standard of living has been declining so much for so long."

Krugman said that the new Treasury bill seeks to ensure the prosperity of all citizens, rather than simply supporting large corporations and the wealthy. "The market is supposed to serve us. Unfortunately, we have ended up serving the market. That's very bad."

Much as Roosevelt, after the Great Depression, put the brakes on C.E.O. wages and irresponsible banking practices, administration officials claim that today we need to rein in the industry that has caused such chaos and misery.

"The building blocks of post-World War II American middle-class prosperity have all been swept away," said House Speaker Nancy Pelosi, who initially op-

Continued on Page A10

IRAQ WAR ENDS

Troops to Return Immediately

By JUDE SHINBIN

WASHINGTON — Operation Iraqi Freedom and Operation Enduring Freedom were brought to an unceremonious close today with a quiet announcement by the Department of Defense that troops would be home within weeks.

"This is the best face we can put on the most unfortunate adventure in modern American history," Defense spokesman Kevin Sites said at a special joint session of Congress. "Today, we can finally enjoy peace — not the peace of the brave, perhaps, but at least peace."

As U.S. and coalition troops withdraw from Iraq and Afghanistan, the United Nations will move in to perform peacekeeping duties and aid in rebuilding. The U.N. will be responsible for keeping the two countries stable; coordinating the rebuilding of hospitals, schools, highways, and other infrastructure; and overseeing upcoming elections.

The Department of the Treasury confirmed that all U.N. dues owed by the U.S. were paid as of this morning, and that moneys previously earmarked for the war would be sent directly to the U.N.'s Iraq Oversight Body.

The president noted that the Iraq War had resulted in the burning of many bridges. "Yet our history with our allies runs deep," he said, "and we all know that friends forgive friends for anything. Or nearly." A spokesperson for the French Ministry of Defense confirmed that France would assist the U.S. withdrawal. "The U.S. helped the Soviet Union defeat Hitler. We do recognize that."

In conflict zones worldwide, leaders and rebels pledged peace. (See "In Conflict Zones Worldwide, Peace Moves," on Page A4.)

On Wall Street, reactions were mixed, with the Dow Jones Industrial Average up 84 points, to close at 4,212. While KBR stock was quickly downgraded to a "junk" rating of BBB-, defense contractors such as Lockheed Martin and Northrop Grumman started up.

Continued on page A5

COURTESY ARMY.MIL

U.S. Army helicopters begin moving troops and equipment from Saddam Hussein's former Baghdad palace.

Maximum Wage Law Succeeds

Salary Caps Will Help Stabilize Economy

By J.K. MALONE

WASHINGTON — After long and often bitter debate, Congress has passed legislation, fiercely fought for by labor and progressive groups, that will limit top salaries to fifteen times the minimum wage. Tying the bill to a plan of overall reform of the U.S. economy, the bill echoes a similar effort enacted by President Franklin Roosevelt in 1942, which was followed by the longest period of growth for the middle class in U.S. history.

"When C.E.O. salaries remain stable thanks to high taxation of high salaries, there's little incentive to take big risks with shareholders' money, and the economy remains in a steady growth mode," said Senator Barney Frank, one of the bill's co-sponsors. "But when C.E.O. salaries can fly through the roof, there's a very strong incentive for C.E.O.s

Continued on Page A10

TREASURY ANNOUNCES "TRUE COST" TAX PLAN

By MARCUS S. DRIGGS

The long-awaited "True Cost" plan, which requires product prices to reflect their cost to society, has been signed into law.

Beginning next month, throwaway items like plastic water bottles and other items which are wasteful or damaging to the environment will be heavily taxed, as in many developed countries. Steep taxes will also apply to large cars and gasoline.

The new plan calls for a 200 percent tax on gasoline, comparable to the one long in effect in most European countries. Companies and consumers are already switching in droves from inefficient gas vehicles to new electric cars. "We suddenly have a waiting list 200 names long for the EV1," said Jake Cluber, the owner of Cluber Chevrolet in

Continued on Page A10

Recruiters Train for New Life

As a ban is imposed on recruiting minors, ex-recruiters nationwide look for new work. The Times follows one on his job-hunt odyssey through Manhattan and surrounding areas.

BY BARRY GLOAD, PAGE A12

Last to Die

Two proportional monuments — one to the Iraqi dead, 300 feet high, and one to the American dead, 15 feet high — are unveiled in Baghdad, and a five-year-old boy whose lifespan coincided with that of the Iraq War is remembered.

BY I. FINISTERRA, PAGE A5

USA Patriot Act Repealed

Eight years later, a shamefaced Congress quietly repeals the much-maligned USA Patriot Act, unanimously… or almost.

BY SYBIL LUDINGTON, PAGE A8

Evangelicals Open Homes to Refugees

Up to a million Iraqi exiles — nearly half of the total — will find sanctuary in Christian homes across the U.S., vows the National Association of Evangelicals. Other denominations are expected to follow.

BY W. WILDEFORCE, PAGE A7

Public Relations Industry Starts to Shut Down

The public relations industry has been criticized for misleading the American people, corrupting politicians, and even helping to start wars. Now, it's beginning the process of shutting down for good.

BY LOUIS BECK, PAGE A10

Ex-Secretary Apologizes for W.M.D. Scare

300,000 Troops Never Faced Risk of Instant Obliteration

By FRANK LARIMORE

Ex-Secretary of State Condoleeza Rice reassured soldiers that the Bush Administration had known well before the invasion that Saddam Hussein lacked weapons of mass destruction.

"Now that all of you brave servicemen and women are returning, it's important to us to reassure you, and the American people, that we were certain Hussein had no W.M.D.s and that he would never launch a first strike against the U.S.," Ms. Rice told a group of wounded soldiers at a Veterans' Administration hospital yesterday.

Figure 13: Front page of the New York Times Special Edition (2008). (photo: Ars Electronica, creative commons, retrieved from http://www.flickr.com/photos/arselectronica/4358504909/)

Dunagan notes that he and Candy both share an appreciation for culture-jamming duo the “Yes Men” and their style of provocative prank; the “New York

Times Special Edition"[1] project (figure 13), for which the Yes Men were partially responsible, is a particular favourite, and an archetypal illustration of "future-jamming".

Process and Roles

Candy describes the process of developing experiential scenarios in several steps. Taking written scenarios as a starting point, they begin by asking a series of questions:

> 'If this [scenario] were history … what elements of evidence would it leave behind? … What kinds of TV shows would be playing? What do the ads look like? What do people eat or drink out of? How do they communicate?'

The next step is to determine which of those possible pieces of evidence should be materialized. Here, they employ a set of principles developed over time through their practice (see Candy 2010 for an in-depth discussion of these). One such principle is "the tip of the iceberg" - the elements of the scenario that, if made visible, will evoke a sense of the whole. Dunagan likens the overall process to that of film-making, in that there are many different components that must be coordinated to create a coherent world.

[1] Created by the Yes Men in collaboration with a number of other artists and activist groups, the "New York Times Special Edition" was a one-time spoof of the New York Times print edition newspaper, distributed on the streets of New York and Los Angeles on November 12, 2008. The paper was dated July 4, 2009, and consisted entirely of headlines and news depicting the pranksters' preferred future.

Given that experiential scenarios are developed explicitly for consumption by another party, there is a relatively clear separation between the roles of producer and consumer in comparison with some of the other practices considered.

Motivations

As described in the overview, experiential futures is a methodology that aims to redress some of the shortcomings of more conventional foresight methods. For Dunagan, the major shortcoming of conventional methods is that they don't address our limited cognitive capacities to deal with the abstraction that is "the future":

> [The future is] an inherently abstract concept … it's something we think about a lot but we tend not to be very good at … and one of the reasons … is that we can't really understand these abstract things very well.

For Candy, the issue seems to be less about human cognitive limitations and more about the fact that analytical presentations of futures don't speak to the visceral or emotional part of our being, and therefore fail to capture the attention of the audience in a manner that might lead them to act on their learning. Both explanations lead to a similar point, which can be described as the difference between intellectual learning and what might be called deep, gut-level learning; the difference between simply knowing about something and truly feeling it. As Candy explains it, "the safety of a workshop or a scenarios whitepaper … may not lead to the kind of change of mind or *change of heart* that actually constitutes

learning something in a significant way about an unknown future." (emphasis added)

What effects do Candy and Dunagan hope that such learning will have on the learners? Dunagan emphasizes improved thinking: "the goal is to try to get people to think more deeply and more usefully about the future", "to understand the future in a deeper … way, in order to make better decisions to lead toward their preferred future". Candy emphasizes engagement with, and appreciation of, "the landscape of possibilities", describing a successful experiential scenario as leading to "a bone-deep reckoning with possibility that wouldn't otherwise happen..." The commonality is depth, a deepening of engagement with – and hence understanding of – possible futures.

There is also an ethical dimension to experiential futures. Dunagan speaks of global challenges such as climate change, and hopes that "through the process [of an experiential scenario] people will see that they have a responsibility to future generations, and … take that responsibility into account when they make decisions today..." In Candy's view, "the first ethical duty of the futurist is to pluralize, to diversify the images of the future that are available...", and the "main goal of futures studies [should be] to improve thinking about futures in the public mind", rather than just in the academic and consulting settings in which it has traditionally been deployed.

Intended Audience

The intended audience seems to vary on a per project basis. Those projects that take the form of a workshop are obviously directed at the workshop participants; other projects, in particular those with a guerrilla-art flavour to them, are geared toward the public. In general however, it is clear that experiential futures is a way of bringing futures thinking to the wider public, to those without “a prior intellectual interest in the future...” (Candy).

4.1.4 Creative Disruptions – Miriam Simun

Overview

Simun describes the practice of “creative disruptions” as the design of "possibilities that very much could and might exist in reality", in order to “fundamentally shift thinking in some way”. It is about taking the mundane - the everyday objects, rituals and scenarios - and introducing shifts that are subtle yet significant enough to disrupt routine – the “going forward without thinking too much” - and, if only for a moment, have people consider the world differently. The word “creative” denotes not only the creative nature of the practice, but also refers to Simun’s hope that a creative disruption creates “a new way of thinking” and possibly “a new way of being” for those who experience it.

Product

Figure 14: Simun's Human Cheese (2010) explores the possibility of a world where the consumption of cheese made from human milk is as natural as the consumption of cheese made from animal milk. (photo: Miriam Simun, used with permission)

Simun tends toward creating immersive experiences, often rendered in the form of fully functioning prototypes, as for example with the *Human Cheese* project (figures 14-15) – for which she has created real, edible human cheese[1] - and *Visceral Switch #1* (figure 16). Simun gives two reasons for working in the medium of immersive experience. The first is the desire to reach a wide audience – those who might not be willing to engage with a more purely abstract treatment of the subject matter. The second is the irrefutability of visceral experience over mere thought experiment. As she explains it, there is a difference between being presented with "a proposition, [an] idea to think about..." and being confronted with the sensory experience of touch, smell, and the literally visceral experiences of eating and digestion. It is ultimately driven by

[1] In the case of this project, the term 'speculative' might seem to be problematic. Is real human cheese a *material representation of the speculative*? Arguably it is, providing that what is taken to be speculative is not the existence of a world with human cheese, but rather the existence of a world in which human cheese is unremarkable. In other words, even if the artifact no longer has the status of a speculative entity, it retains the capacity to connote a speculative world for as long as it remains normatively unfamiliar.

the desire to have people “suspend their disbelief for a second, and … engage fully in [an] alternate mode of being.”

Process and Roles

The process depends on the nature of the project. Some have well-defined endpoints from the outset, whereas others may involve more exploration. It is not clear whether Simun adheres to any specific design process or uses particular methods.

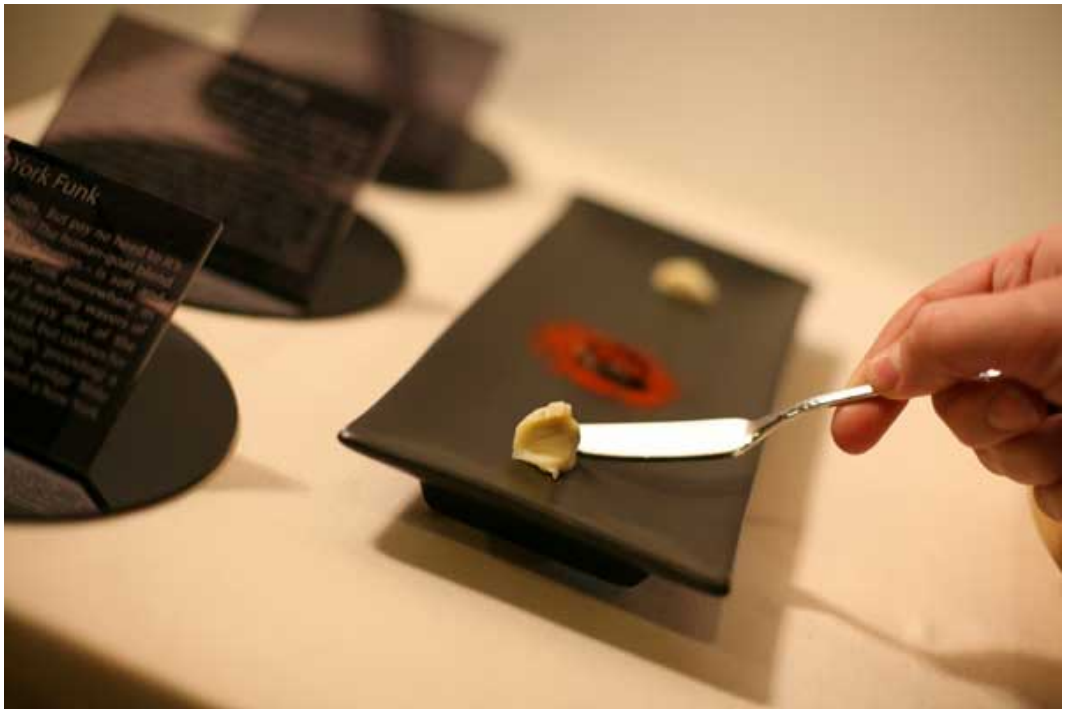


Figure 15: As part of the Human Cheese project, a tasting event was held where a number of different human cheeses were available to be sampled. (photo: Miriam Simun, used with permission)

It would seem that Simun's work shares with experiential futures the goal of creating a well-defined experience for consumption by another party, and hence, a clear separation between producer and consumers. Yet, Simun is quick to point out that she is “not just creating theatre” for others, but that the “event or … experience is … collectively defined by the people that are participating in it...”, and that they “very much shape … how I think about [the work]”.

Motivations

As noted in the overview, Simun's stated purpose is to "fundamentally shift thinking". In what sense does she want people to consider the world differently? She notes the rapid pace of techno-social change and the inability of traditional institutions, such as education and law, to cope with this change. She sees her pieces as prompts for inciting debate, “nodes around which some kind of … discourse can happen”, in order that people consider more deeply the implications of human choices and activities.

A significant concern for Simun’s work is that of creating experiences that go beyond the intellectual to engage other senses and confront people with a visceral experience of an alternate reality. She speaks of success in terms of creating work that appeals to a wide audience with diverse levels of knowledge around the subject matter – that “meets people where they are” - and inciting heartfelt debate about important issues of techno-social change.

Figure 16: Simun's Visceral Switch #1 (n.d.) is a light-switch whose operation requires a level of physical exertion that is more commensurate with the result of the action i.e. the energy consumed by the light. (photo: Miriam Simun, used with permission)

Intended Audience

Simun wants her work to reach the widest possible audience: “I'm not interested in creating work [where] you already need to know [a] language [to] engage with it – I'm trying to make very public-facing … work that deals with everyday issues.” In reference to the Human Cheese project, she notes that “it meets you wherever you are”; everyone can engage with the work at a basic level, and yet there are complexities for those who want to delve deeper.

4.1.5 Future Fabbing – Scott Smith

Overview

"Future fabbing" is a workshop-based practice in which workshop participants generate future scenarios and then rapidly develop lo-fi prototypes for products and/or services that might exist in those scenarios. The practice evolved in response to what Smith - a futurist and strategy consultant - perceived as the limitations and failings of the conventional methods employed in his industry. "Too often in the past, … the futures community has been stuck in two-dimensional responses [to clients' problems]", and these methods fail to get clients to engage deeply with the material. He notes that clients, and those of a younger generation in particular, increasingly seek "tactile, experiential ways of communicating concepts … and not just communicating but involving [them] in the exploration factor."

Smith cites design fiction as a significant conceptual influence on the thinking behind the future fabbing practice. "Design fiction for me … is a way of representing speculative concepts in a more rich fashion than … narrative scenarios..." - it is using the "processes of design to help illustrate and communicate, and also allow users to interact with [a] speculative environment." However, future fabbing is explicitly conceived of as a collaborative process of making to be performed in the context of a small group workshop.

Product

Workshop participants are encouraged to produce tangible prototypes, generally lo-fi mock-ups representing possible future products or services (figure 17). Smith stresses the importance of the physicality of the medium to creating a sense of engagement among participants, stating that it's important to him that "the participants hands are on it from beginning to end":

> It's allowing people to … stand up, reach across, move things around, become involved. … If you sat on your hands you couldn't participate in [the] process. It … forces a physical interaction that I think is really important. … If you have five people around a table and each of them are holding an element of [the] story, they are literally putting their piece into the mix. (Smith)

Figure 17: Future fabbing workshop participants demonstrate their prototype. (photo: Scott Smith, used with permission)

Process and Roles

The future fabbing process is based on the model of a typical foresight scenario development process, except that, as Smith puts it, he has tried to "open both ends up...". By this he means that the participants have the opportunity to author both the narrative scenarios, including identification and selection of the inputs (e.g. trends, drivers) to those scenarios, and to develop lightweight prototypes representing products, services, or other artifacts that might exist in those scenarios. The process of narrative construction may be based on a card-based, game-like process, and the output prototypes constructed using readily available materials (figure 18). "There's a fabrication process at the narrative level and a fabrication process at the scenario level at the end." The process is designed to be lightweight and iterative, such that it might be repeated several times during the course of a day.

The producers and consumers are one and the same. Ideally, all stakeholders to the output are involved in the process of creation: "It's important to have many people involved at the front end of the process, because … that makes them better consumers of the output."

Motivations

A future fabbing workshop has several objectives. One is to enhance clients' ability to work with possibility. Smith believes that the process of making tangible representations of possible futures helps "move [the] understanding or experience of possible futures closer to my user", giving them "a more effective

means of digesting and contemplating the possibilities...". Referencing an idea which he attributes to Bleecker and Sterling, he explains: "What I'm concerned with is how do you leap over … cognitive barriers to help people better conceptualize possible futures..."[1]

Figure 18: Tools and materials for use in a future fabbing workshop. (photo: Scott Smith, used with permission)

[1] This is likely a reference to the phrase "Design seeks out ways to jump over its own conceptual walls..." (Sterling 2009:3)

Another objective is to bring people together to build common vision. The collaborative process creates “a space for argument and discussion to come to a common understanding of the story”. Key to the practice is that participants quite literally construct their collective future worlds. In conversation Smith references the notion of “social constructionism”, which might be interpreted as a suggestion that future fabbing is almost a literalization or a *making explicit of* the underlying processes of social construction occurring within a group. Having everyone in the group involved in the process is about the “building of a narrative that forces the blending of ideas”; it is “a kind of democratization of foresight.”

Smith speaks of the success of a workshop primarily in terms of the level of engagement of the participants, which he gauges in part by “the level of activity in the room, the level of discussion … the heat of the exchange.” He considers the outcome – “does somebody take an element of one of these ideas and actually put it into play?” - as being of secondary importance.

Intended Audience

Given that future fabbing generally unfolds in the context of a workshop, and that, as previously noted, the producers and consumers are one and the same, the workshop participants are by definition the intended audience.

4.2 Discussion

In this section, the commonalities and differences between the practices are discussed, again using the four perspectives of product, process and roles, motivations, and intended audience.

4.2.1 Product

Figure 19 shows the product theme map.

Figure 19: Product theme map (see Appendix C for larger version)

Figure 20 summarizes the types and characteristics of the outputs produced by each practice. The darkness of the dot indicates the relative degree to which a

characteristic applies to a practice, based on an assessment of the emphasis of the practice and evidence of the characteristic in its documented work.

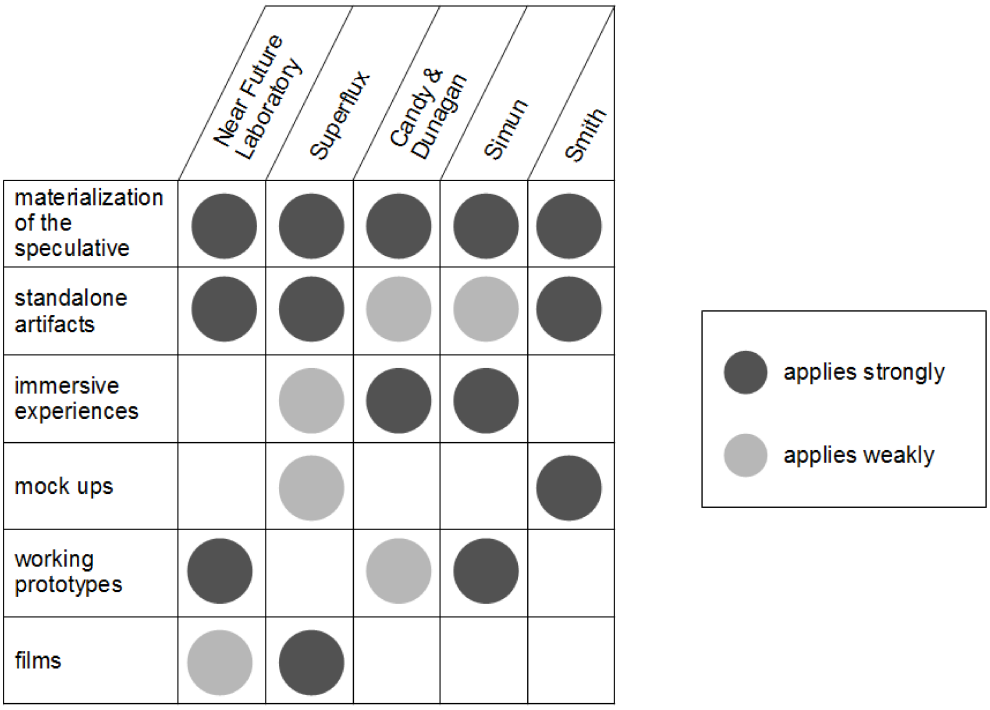


Figure 20: Product characteristics

All practices produce *material representations of the speculative* that generally take the form of standalone tangible artifacts and/or groups of artifacts intended to act together to create an immersive experience representative of a speculative world. In the case of a standalone artifact, the artifact still functions to provide an experience – specifically, the experience of what it is *like* to live in a world where such an artifact exists. In a sense then, all of these practices can be said to produce experiences, with varying degrees of "immersiveness", although as will

be seen in 4.2.2, some are more explicitly concerned with producing experiences than others.

The notion of *immersion* is not a straightforward one to define. In his work on virtual reality, Heim has noted that, while experiences can be said to vary in their degree of immersion, and there is some correlation between immersion and the degree of sensory engagement and interactivity afforded by a medium, the experience of immersion is not ultimately a function of the environment alone. It is a subjective quality of an individual's experience, and as such, it depends upon the individual's cultural and educational background and personal psychology (Heim [1998] 2000). For present purposes, “immersiveness” is used to indicate the degree to which the materialized speculative world attempts to obscure from the experiencer's perception the “background” of the actual world with a “foreground” of speculative artifacts, independent of subjective considerations.

Why this emphasis on creating physical, real-world experiences? Figure 19 suggests four major themes, referred to here as *exploration and discovery, enhanced communication, collaborative making,* and *making it 'real'*. The first three of these are discussed only briefly here but returned to in section 4.2.3. Most of this section is devoted to the last.

Exploration and discovery

For some practices e.g. the Near Future Laboratory, the creation of physical working prototypes enables the exploration of possibilities and discovery of new alternatives.

Enhanced communication

Both Simun and Candy/Dunagan indicate that the physical medium is a means of reaching an audience that would not likely be interested in a verbal, analytical treatment of the subject matter.

Collaborative making

In future fabbing, the physicality of the medium plays an important role in catalyzing social interaction among the participants, and enabling them to collaborate in the building of artifacts that represent a shared vision, "literally putting their piece into the mix." (Smith, personal communication 2011)

Making it "real"

All of these practices try, on some level, to blur the line between the speculative and the real, to take that which might be easily dismissed as impossible and make it seem not only possible but plausible; in other words, to suspend disbelief. Sterling has made a similar observation with his description of design fiction (noted in section 1) as "the deliberate use of diegetic prototypes to suspend disbelief about change". The view among practitioners seems to be that embodying a representation of a possible world in a physical real-world

experience accomplishes this suspension of disbelief more effectively than would a representation via other media. As Candy put it:

> ... the reason to do artifacts – to do things in … material forms that assert their reality with a force that a verbal or written presentation alone doesn't have – is that it takes some of the fictionality out of it... (Candy, personal communication 2011)

While it seems intuitively obvious that material forms do "assert their reality", the question remains as to why this is so. Why might a speculative world expressed through material artifacts be experienced as more "real" than one described verbally, or depicted in images or film? This is not a straightforward question to answer (partly because it is difficult to articulate precisely what it means to experience something as *more "real"*) and a full treatment of it is beyond the scope of this work. Nevertheless, it is worth considering briefly here the relationship between sense perceptions and reality. In his work on the theory of affordances, psychologist James Gibson has noted that the notions of animal (or human) and environment are mutually constitutive – that each effectively brings the other into being (Gibson 1979:8). Furthermore, sense perception, as the singular connection between animal and environment, is the mechanism by which this occurs. Thus, sense perceptions constitute the animal's most basic reality. Given that verbal descriptions and mediated representations of objects or worlds inevitably lack some of the perceptual information that would be available to the perceiver if the referent objects were physically present, it is understandable that objects or worlds thus represented would be experienced as less "real".

Putting aside the question of *why* a material representation of a speculative world might be experienced as more “real” than one represented otherwise, it is instructive to consider how the product of each practice is tailored to what that practice tries to make “real”. For example, the Near Future Laboratory's emphasis on working technological prototypes is consistent with its objective of exploring techno-social considerations in the realm of near future digital technology. Arguably it would be difficult to explore such considerations with any degree of depth if the prototypes were not operational. Experiential futures emphasizes immersive experiences of high verisimilitude, but does not focus on technological development. This is consistent with its objectives of projecting further out into the future – which entails radical social and political propositions that may be more visible than technological changes alone – and of engaging people on an emotional level. Future fabbing emphasizes mock-ups that are neither working prototypes (necessarily) nor immersive experiences. This may be partly due to the constraints of the lightweight, iterative nature of its process. However, the objective of future fabbing, according to Smith, is “agility training”, the ability to consider many different possible futures in a short space of time. Hence it would seem that future fabbing asks for a different kind of suspension of disbelief: it is less concerned with the believability of any particular future or set of futures, and more concerned with the believability of the notion that “the future” is not a predetermined entity but a product of dynamic and active processes subject

to the influence of the participants. It is this notion that future fabbing tries to make “real”.

4.2.2 Process and Roles

What can be said about how these practices are carried out, both in terms of their approach to creating and the roles of various actors as producers and consumers of the work? Figure 21 shows the Process theme map.

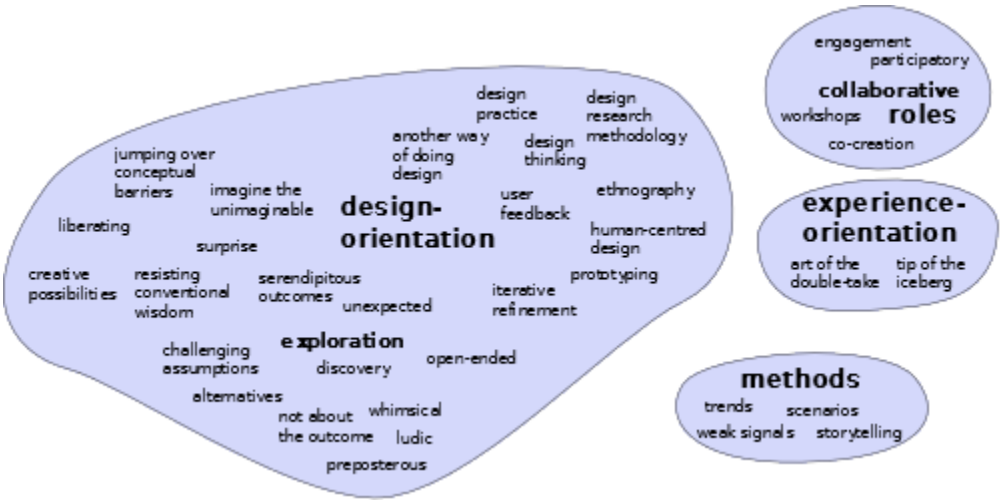


Figure 21: Process theme map (see Appendix D for larger version)

Orientation

The practices can be thought of as falling along a continuum between two very distinct orientations, referred to here as the *design-orientation* and the *experience-orientation* (figure 22). All practices produce tangible artifacts representative of speculative worlds (see 4.2.1), but those dominated by a

design-orientation fundamentally seek to *produce a design for* an element of a speculative world, while those dominated by an experience-orientation fundamentally seek to *deliver an experience of* a speculative world.

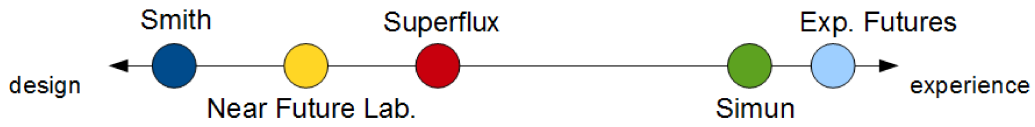


Figure 22: Relative dominance of the design or experience orientation in each practice.

The mindset of the design-orientation is one of *designing for* a speculative future world. The practice is an exercise in problem-finding and/or problem-solving situated in a speculative context, with the goal of producing designs for novel artifacts or services that might exist in this context. In contrast, the mindset of the experience-orientation is one of creating an *experience of* a speculative future world. The objective is to deliver to an "audience" the experience of being in that world. That the experience must itself be designed (and the notion of "experience design" is applicable here, as discussed in Candy 2010) is secondary.

The distinction between the design and experience orientations is somewhat porous. In the process of *designing for* a speculative world, the designer inevitably brings an experience of some elements of that world into being. Conversely, to design *an experience of* a speculative world necessitates designing artifacts for that world. Nevertheless, the distinction is useful in

understanding practitioners' mindsets and processes. Design-oriented practitioners tend to follow a process inspired by the thinking and methods currently popular in the broader discourse of design. This process emphasizes making and learning through making. It is open-ended and exploratory, seeking and responding to new discoveries and possibilities, and welcoming of serendipity. Prototyping, iterative refinement, and user involvement play important roles. As might be expected, experience-oriented practitioners speak less about their design process, and in fact, less about the process of creation at all. Their attention is directed toward what happens after the speculative world has been materialized – toward the experience of that world.

It might be tempting to assume a simple correspondence between practitioners from design and futures backgrounds (see figure 5), and the design-orientation and experience-orientation, respectively. Indeed this seems to hold true for the Near Future Laboratory and Candy/Dunagan, who typify, respectively, the design and experience orientations. However, the other practices defy this simple logic. With *5th Dimensional Camera* for example (figures 9 - 10), Superflux seems to be both designing a technological artifact for a speculative world, and simultaneously designing an experience of that world for an audience in the present. Simun, a designer, seems to hold more of an experience-orientation. While *Human Cheese* (figures 14 – 15) could be read as a design proposal, this is not the most natural reading, and the strength of the work lies in the visceral experience it creates for those who engage with it. And futurist Smith arguably

occupies the most design-oriented spot on the continuum. Future fabbing is by definition a process whereby workshop participants engage in the production of designs for future products or services, and the resulting mock-ups don't lend themselves to the creation of a highly realistic experience of this future.

Roles

Who participates in the process and in what capacity? Who is involved in producing the artifact/experience, and who is involved in consuming it? For example, with future fabbing, the workshop participants create the artifacts for themselves, and hence act as both producer and consumer. Contrast this with experiential futures, where there exists a sharp line between producer and consumer: the practitioners orchestrate an experiential scenario to be experienced by others. However, this is perhaps an over-simplification. The act of creation doesn't end at the moment when the scenario is presented; in many ways the presentation is actually the beginning of a new phase of creation. This is evident in Simun's comment that the “experience is … collectively defined by the people that are participating in it...”. In section 4.2.1 it was proposed that regardless of whether a practice produces standalone artifacts or an immersive experiences, it is always aiming to produce experiences. To complicate matters, it seems that, in Simun's case at least, she produces the artifact but the experience is co-produced by everyone who “participates” in it – those in attendance at the exhibition of the work, those who discuss it in the media, and those who engage in the general conversation spurred by the work.

Things are no less complicated in the case of the Near Future Laboratory. It would seem that the Laboratory is mainly a place for conducting experiments whose outputs simply feed back into the practice to inform further experimentation, and hence that the practitioners are the main consumers of their work. Of the projects documented on their website, only a few indicate that they have been publicly exhibited. And yet, the web documentation can be viewed on some level as the *primary* interface for broad public engagement with the work. Of course, it is questionable how effective an interface this is, given that it does not allow for the direct, first-hand experience of physical artifacts that is so important to the way this work functions. Nevertheless, it does allow the work to be consumed, at least visually, by a much larger number of people, and also makes it possible for unsolicited collaborators to contribute their thoughts during the process of production. The Near Future Laboratory often documents not only the "finished" products of its experiments (if such can be said to exist), but much of the process along the way. There are images of circuit boards and half-finished prototypes, along with play-by-play commentary about the process and any difficulties encountered. Anyone can respond by commenting on the Laboratory's blog, or contacting the practitioners directly. As Sterling has noted, design fiction practices like the Near Future Laboratory unfold within a social network, and the various participants within this network can be said to be "vaguely co-making and co-experiencing." (Sterling, personal communication 2011)

In short, it is much harder to draw simple lines around who produces and who consumes than it might initially seem, and correspondingly difficult to draw generalizations about how these roles are acted out within the different practices. Perhaps a key characterization is one of “open” vs “closed” - how open or closed the processes of production and of consumption are to the world outside of the practice. Yet even then a distinction must be made between the production/consumption of the artifact(s) and the production/consumption of the experience. Furthermore, it is difficult to apply this characterization to each practice as a whole, as different projects within a given practice may be highly variable. And overall, the utility of this characterization is questionable within the context of this project.

Methods

What design and/or foresight methods are used? This research has yielded only relatively vague insights here. Storytelling seems to be an important aspect across many of the practices, which is not surprising given that the products are themselves representations of a scenario or story-world. Future fabbing and experiential futures make use of formal scenarios as a framework. Other foresight methods, such as research and analysis of events and trends, and weak-signal scanning, were mentioned as inputs to the process of some of the practices (specifically future fabbing, experiential futures, and design fiction).

Further inquiry into methods would make a good candidate for subsequent research.

4.2.3 Motivations

Figure 23: Motivations theme map (see Appendix E for larger version)

Why engage in these practices at all? This section considers practitioners' motivations[1], focusing on common themes that emerge in many or all of the practices. Figure 23 shows the Motivations theme map, from which the following 9 major themes were distilled: *working with possibility*; *seeking out possibility*; *learning and educating*; *provocation, disruption and debate*; *intervening in imaginaries*; *critique and vision*; *assertions of agency*; *communication and*

[1] The notion of "motivation" is inherently hierarchical, in that one may always ask, given a motivation, what the underlying motivation is, and therefore whether each of the themes presented here reflect root-level motivations or whether some are subservient to others. Such considerations are not of interest here.

engagement; and *social change*. What follows is a discussion of each of these themes.

Working with possibility

The notion of "possibility", and the ability of humans to interact with it, is a core theme across the board. This is perhaps particularly evident with experiential futures, where each scenario represents a distinct possible future. For Candy, experiential futures is fundamentally about enabling people to "engage with the landscape of possibilities" (Candy, personal communication 2011). What does this mean? He characterizes possibility space along two dimensions: breadth and depth, where breadth entails the variety of possibilities, and depth, the level of detail or vividness of our knowledge of a given possibility (Candy 2010). Hence, engagement with the landscape of possibilities implies both broadening our knowledge of the range of possibilities, and increasing the depth of our encounter with any given possibility. It is exactly this encounter with depth that experiential scenarios aim to provide. For an example of the mechanism by which a "deep" encounter with a scenario might enhance our ability to work with it, consider Candy's notion of the "the experiential gulf", which he defines as "the difference between how we imagine or expect something to seem in advance, and what it's actually like *being there*." (Candy 2010:73, emphasis in original). The experience of "being there" typically includes emotional components that simply aren't present in a hypothetical imagining of a situation, and Candy cites various sources of evidence from neurology and psychology that suggest that

these affective components play an equal if not more important role in human decision-making than analytical considerations (Candy 2010). By restoring to some degree the affective component of our experience, materializations of speculative worlds might commensurately restore our capacity to make decisions about those worlds as if we actually lived in them, thus enhancing our ability to work with those possibilities.

In the context of a design practice, prototyping is one of the primary means of working with possibility. Borrowing the language of “breadth” and “depth”, the creation of a prototype is essentially a means of enriching our encounter with a given possibility (depth), whereas a range of possibilities can be explored through the creation of multiple prototypes (breadth). Houde and Hill (1997) propose a typology of three kinds of prototypes, according to the aspects of the design problem that the prototype intends to address: they term these aspects “role” (the role of a designed artifact in a user's life), “look and feel” (the experience of using the artifact), and “implementation” (the technical concerns of how the artifact works). “Role” prototyping seems particularly apt to capture the kinds of techno-social explorations in which some of these practices (e.g. the Near Future Laboratory) engage. In the context of designing for a speculative world, there is no reason to start from the assumptions underlying today's categories of designed artifacts and the roles of those artifacts in people's lives.

The process of elaborating the breadth and depths of possibilities may in some cases include an element of wrestling with the line between what seems "possible" and what does not. As discussed in 4.2.1, all practices employ materialized representations of speculative worlds to manipulate the perception of this line in some fashion.

Seeking out possibility

Whereas experiential futures seems to be primarily concerned with the anticipation of possibility, possibility in its aspirational sense is no less relevant to these practices as a whole. The more design-oriented practices in particular tend to stress the active discovery and creation of new alternatives to present conditions. And Simun, whose work seems more experience-oriented, notes that it has been important for her to go beyond being "critical and dystopic to get people thinking" and to seek out "the creative possibilities of both technology and human endeavours".

DeBono's work on "lateral thinking" suggests a number of concrete mechanisms by which the exploratory, meandering, or playful processes characteristic of the design-orientation can lead to the discovery of new possibilities. For example, one such mechanism is to defer judgement of intermediate outcomes: "... one is allowed to be wrong on the way even though one must be right in the end. … One may have to move to an untenable position in order to be able to find a tenable position." (De Bono [1970] 1973:107) By assuming an exploratory

stance and building prototypes for artifacts that may in some sense be “wrong”, the practice may unwittingly find that it has somehow arrived at something “right”. DeBono also notes that the deferral of judgement may allow an idea that appears “wrong” within a given frame of reference to ultimately show that perhaps it is the frame of reference that is “wrong” (De Bono [1970] 1973:110). The notion that a problem's frame of reference is variable (as opposed to only the solution) suggests another mechanism by which new possibilities may open up. An artifact designed for a particular speculative world may, in the process of being made and experienced, in turn suggest another world, or frame of reference, in which it plays a different role. In other words, the artifact suggests a new problem-framing or an altogether new problem. This is of particular interest in relation to the notion of “wicked problems”, as it has been argued that the process of locating and defining problems – problem-finding and problem-framing – is itself one of the most intractable problems (Rittel and Webber 1973).

Learning and educating

To work with possibility is to learn, and so it is not surprising that all practitioners cite learning, in one form or another, as one of the key motivations behind the practice. What differs among them is the focus and site of learning – what is being learned and by whom. In some cases the focus is clearly on educating others. Experiential futures aims to create a learning opportunity for those who experience the work, in order to improve their thinking about the future. As discussed in 4.1.3, the emphasis here is on experiential rather than intellectual

learning. Some of Superflux's work too has a distinctly educational facet to it, such as the *5th Dimensional Camera* (figures 9 - 10). Simun's desire for her work to "shift thinking" represents a more diffuse conception of the desire to educate. For Bleecker and Nova, the learning comes through making and interacting with new technological artifacts, in order to gain insight into the social possibilities and implications of new technologies. The focus in this case seems to be more internal, in that it is the learning of the practitioners themselves that is emphasized, rather than that of others. And yet, presumably this knowledge is both co-produced with, and co-consumed by, the wider collective of collaborators, users, clients, and fans engaged with their practice (as discussed in 4.2.2). With future fabbing it is the workshop participants who learn and educate one another as they expand their sense of their collective possible futures.

Provocation, disruption and debate

All practices share a desire to create work that disrupts the existing discourse around the topic area of that work and provokes their audiences into a reconsideration of that discourse. Simun's *Human Cheese* (figures 14-15) and *Visceral Switch #1* (figure 16) projects ask people to reflect on their food and energy habits respectively. The Near Future Laboratory's *Slow Messenger* (figure 7) asks whether the desire for instantaneous communication doesn't have a cost in terms of in intimacy. Candy and Dunagan's *Found Futures* projects (figure 12) confront one, unannounced, with raw manifestations of possible

futures. Smith describes his workshops as “like poking a stick in a bees' nest … and getting the bees riled up ...” (Smith, personal communication 2011).

Intervening in imaginaries

The desire to disrupt and provoke can be viewed as desire on the part of practitioners to intervene in the imaginaries of their intended audiences, with the ultimate intent of bringing forth more preferable worlds. The term “imaginary” is used here as a kind of generalization of the more specific term “social imaginary”, found in the work of philosophers Cornelius Castoriadis and Charles Taylor. Drawing from Castoriadis, Thompson provides the following useful and appropriately (for present purposes) non-technical explanation of the concept of the “social imaginary”:

> What is important in the dimension of the social-historical is not that human beings always eat and have children, but that they do so in an infinite variety of ways. It is precisely this infinite variety, this indeterminate range of possibilities which builds upon but always exceeds the material conditions of human life, which is the domain of the social imaginary.
> The social imaginary is expressed primarily through the constitution of a world of significations. By means of these significations - these symbols and myths in which a society represents its present and its past - a society is endowed with an identity and distinguished both from other societies and from an undifferentiated chaos.
> ...
> The central imaginary significations of a society ... are the laces which tie a society together and the forms which define what, for a given society, is 'real'. (Thompson 1984:23)

To avoid engaging with the more technical or specific connotations of “social imaginary”, the term “imaginary” will continue to be used here . The important

points about the concept of an imaginary are that: it consists of significations that exist in the shared imagination of a collective, tying its members together in present and past identity and future vision; and that these significations define what, for that collective, constitutes the “real”.

As Bleecker has written, “if we're trying to imagine new, more habitable future worlds, we need stories that help anchor those worlds in a shared imaginary.” (Bleecker 2009:83) Design fiction is about “creating things that 'start and circulate conversation' about what can be(come).” (Bleecker 2009:85) And this provides a clue as to one way in which design fiction goes beyond traditional design prototyping: “Prototypes are coherent functionality, but they lack a visionary story about what makes them conversant on important matters-of-concern.” (Bleecker 2009:85) In other words, more than just a prototype for a possible future technology, a successful design fiction object takes on a symbolic life, traveling through imaginaries as an ambassador of a particular possible future.

A similar line of thinking is expressed by Superflux, who see their design futurescaping work as also functioning on a semiotic level:

> Individual artifacts and design fictions provide ... catalysts for public discourse and debate. Necessarily speculative, at a semiotic level, they operate through connotation, mobilising a web of links, topics, and associations. In this way, they act, first, at the level of the tangible, showcased in exhibitions and events, later experiencing a mediated afterlife in digital archives, websites, and social media. (Jain et al. 2011:12)

The notion of the imaginary appears in experiential futures in conjunction with the idea of *images of the future*. The word 'images' as used in this context implies much more than just visual images of the future: it includes “unconscious dreams, yearnings, hopes and aspirations” (Polak 1961 cited in Candy 2010:28). And according to Candy, “the study of futures is recognized as being based primarily on 'images of the future', which we all have in our heads, and which circulate in our cultures.” (Candy 2010:28) He explains the relationship between images of the future and experiential futures methodology as follows:

> If you accept that [images of the future] is the central stuff that we work with in futures studies, then it also makes sense to think of that as the central point of intervention … Experiential scenarios are about intervening in that economy of images as directly as possible, by doing it in the language of experience and of the senses... (Candy, personal communication 2011)

Neither Simun nor Smith speak explicitly in terms of imaginaries or images of the future, but the existence of such entities is nonetheless implied.

It is interesting to consider the notion of an imaginary in light of a couple of related ideas, one being Meadows notion of “paradigm” (mentioned in section 2), and the other being Sterling's notion of “metahistory”. The latter is elaborated in Sterling's book *Shaping Things*:

> Metahistory is about what's gone by, what comes next, and what all that is supposed to mean to sensible people.
> …
> A culture's metahistory helps it determine whether new things are appropriate, whether they fit into the trajectory that is considered the right track.
> …

> [Metahistory] is the ultimate determinant of the shape of things. It's through metahistory that people come to realize that new things are proper things. New objects that can fit into a metahistorical context are seen as progressive advancements. Otherwise they are considered alien impositions or odd curiosities. (Sterling 2005:37-39)

It's hard to know what exactly Sterling is getting at with this neologism, but it sounds not too far off from the notion of imaginary as defined in the preceding paragraphs. Treating these terms as roughly equivalent suggests that what the quoted paragraphs offer is a sense of how a culture's imaginary expresses its relationship to the new, enabling it to accept or reject a given new idea. Thus, Sterling might be rephrased to say that "the imaginary is the ultimate determinant of the future." Whether or not such a proposition is entirely true, it is not hard to accept that a culture's imaginary, while perhaps not wholly *determinant* of its future, is certainly influencing of it.

Meadows certainly recognized this in her work on systems. She uses the word "paradigm", explained as follows:

> The shared idea in the minds of society, the great big unstated assumptions, constitute that society's paradigm, or deepest set of beliefs about how the world works. These beliefs are unstated because it is unnecessary to state them – everyone already knows them.
> …
> Paradigms are the sources of systems. From them, from shared social agreements about the nature of reality, come system goals and information flows … (Meadows 2008:163)

For Meadows, systems are born of paradigms, and hence, to intervene in a system at the level of the paradigm is to completely transform the system (ibid). Both Thompson's "social imaginary" and Meadows' "paradigm" emphasize the

importance of the social construction of the “real”, which is in a sense the primary subject of analysis in Inayatullah's “critical futures”. To truly intervene in an imaginary is to cause a culture to question how the “real” world of the present has come into being, and how it might be otherwise.

Whether they speak in terms of imaginaries, stories, or images of the future, the practitioners considered in this study are generally aware that they are dealing also in a currency of signification; that as much as the products of these practices act directly at the level of individual experience, the true reach of their influence lies in their reverberation through imaginaries. Yet there is something of a paradox here (alluded to in 4.2.2): if a large part of what makes the experience of this work compelling is to be found in the physicality of a direct, first-hand encounter with it, then one must ask what is lost when the work is encountered in the form of such second-hand “reverberations”. Do material objects make for particularly compelling signifiers even when their materiality cannot be experienced? This remains an open question, and one that deserves further inquiry.

Critique and vision

Intervening in imaginaries often entails elements of both critique of the status quo and the offering of visions of how things might be different. Often these are like two sides of a coin: the creation of artifacts that postulate an alternative to the norm acts inherently to critique existing assumptions (Rendell cited in Maze and

Redstrom 2007), and conversely, an intentional critique often takes the form of an artifact that proposes an alternative, as for example in the work of Dunne and Raby (e.g. Dunne and Raby 2001). Bleecker has written of design fiction as a practice that is generally critical of the lack of imagination, both in product variety and in notions of progress, that characterizes the majority of commercial design practice: design fiction “casts a critical eye on current object forms and the interaction rituals they allow and disallow” (Bleecker 2009:8) and strives to “create an alternative to the programmed myth that there is only one future on the flat graph that goes up and to the right...” (Bleecker 2009:25). The Near Future Laboratory's *PSX* project (figure 8), for example, seems to critique the gaming industry's lack of imagination merely by proposing an alternative – a world in which video game playing must be fueled through real-world physical activity. Superflux too acknowledges the influence of critical design on design futurescaping (Jain et al. 2011), and Jain speaks of the need for designers to question their own practices (see section 4.1.3). With *Human Cheese*, Simun offers up a critique of human food culture by simply manipulating one variable (the source species) of an otherwise common practice (the consumption of coagulated animal milk). Whether or not this is intended to function simultaneously as a vision for an alternative is unclear, although it seems unlikely. In future fabbing, explicit critique seems unlikely to be relevant, but collaborative making is a means toward the creation of shared vision among workshop participants.

Assertions of agency

The theme of human agency emerges on several levels. The term "agency" here is used to mean the capacity of individuals to influence and shape the social, political and technological worlds in which they live, as opposed to those worlds being predetermined entirely by external forces.[1] This notion of agency is easily illustrated in terms of the well-known agency vs structure debate in the social sciences, the central question of which is the relationship between individuals and society: do individuals determine society, or are they determined by it? In the former case, individuals are free to make choices and act independently; in the latter, this freedom is illusory. Contemporary theorists generally take a more nuanced view, in which neither extreme is accurate, but rather, individual and society co-determine one another in an ever-evolving feedback process (Burr [1995] 2003). In this view, individuals have some degree of agency and yet they are never entirely free from constraints imposed by the structure ("the institutions and frameworks of meaning handed down to us by previous generations" (Burr [1995] 2003:187)) of the conditions in which they live (ibid).

To attempt to disrupt discourse and intervene in imaginaries, as discussed above, is clearly an assertion of agency on the part of practitioners. However, in these practices, it is also an attempt to enable the agency of those who participate in the experiences. Scenarios work to enable agency in those who experience them by showing the breadth of possible futures and the inevitability

[1] Agency as a metaphysical problem is not relevant here, nor are distinctions between different variations – technological, social, economic – of determinism.

of none. Experiential scenarios augment this by adding depth to each individual scenario, in the form of visceral knowledge of what life in that scenario might feel like. Broadening and deepening participants' knowledge of possibilities enhances their ability to work usefully with those possibilities, enabling their agency. As another example, consider again Simun's *Human Cheese* project, which asks each participant to make an individual choice of whether or not to consume human cheese, or at least to consider how they feel about the prospect. In asking one to make such a choice, the work raises an awareness of how one's individual choices act collectively to establish notions of normal.

For design-oriented practices, the act of design itself can be viewed as an assertion of agency. As Nova says about the initiation of the Near Future Laboratory: “It was a way for us to be actors, to produce certain kinds of alternative futures.” (Nova, personal communication 2011) For Jain, this appears as the desire to play a role in shaping the journey from science to technology. With future fabbing, merely engaging non-designers in the act of making raises participants awareness of their ability to play an active role in the construction of their world.

Communication and engagement

To have any hope of intervening in imaginaries and enabling agency requires first being able to capture and then retain people's attention – that is, to engage them. And to engage people, one must be able to communicate in a manner that

reaches them. Several practitioners speak of materialization of the speculative as a means of enriching communication in order to engage specific audiences. For Candy, it is the non-specialist audience, to whom traditional foresight methods – consisting of more cerebral presentations of future worlds – don't seem to connect with very well:

> The field of futures or foresight has been on foot for something like half a century,without really making a mainstream impact on how the proverbial man in the street thinks about the future, which suggests a disconnect between the material that we're working with and the wider cultural project of improving that discourse. … The most influential and vivid images of the future still come from entertainments, and so there's a reconciliation there that has to happen between the educational and the entertaining... (Candy, personal communication 2011)

Simun shares a similar perspective, noting that for any given project, she could "write an essay" instead of creating an immersive experience, but that the former is unlikely to reach the audience that she is interested in reaching.

For Smith, it is people in a corporate setting, many of whom are suspect of the value of foresight to begin with. The remedy to this skepticism is to engage people in the foresight process. Future fabbing serves to get people actively engaged in the process, while generating prototypes that facilitate communication around speculative concepts.

Social change

To recap this section so far, the motivations discussed have included enhancing people's ability to work with possibilities and seek out new ones, disrupting

discourses and provoking debate, meddling in imaginaries with critiques and visions, enabling agency, and striving for engagement. Why do any of this? On some level, many of these practitioners express a desire to contribute to some form of social change through their practice, as noted throughout section 4.1. This is briefly summarized here.

Dunagan is perhaps most explicit in this regard. While he is careful to state that the goal with experiential futures is to help people think "more deeply and more usefully about the future" (Dunagan, personal communication 2011) in order to work towards *their* preferred world, rather than to advance his own preferences, he does acknowledge that responsibility to future generations is an important ethical underpinning of the work. Likewise, Candy, while not stating a particular agenda, indicates that he believes "good quality futures thinking" is "badly needed, on a wide scale" (Candy, personal communication 2011). In addition to voicing his criticism of "up and to the right" progress, Bleecker has expressed an interest in "a willfulness to create different worlds, perhaps more habitable, mindful of all the good things for which one might strive." (Bleecker 2009:84) Jain too speaks of Superflux's desire to create more positive alternate futures, and Simun, of her desire to have people consider more deeply the implications of the things they do and the choices they make.

4.2.4 Intended Audience

Figure 24 summarizes the various audiences primarily targeted by each practice. The darkness of the dot indicates the relative degree to which a practice targets an audience, based on an assessment of the emphasis of the practice and its documented work.

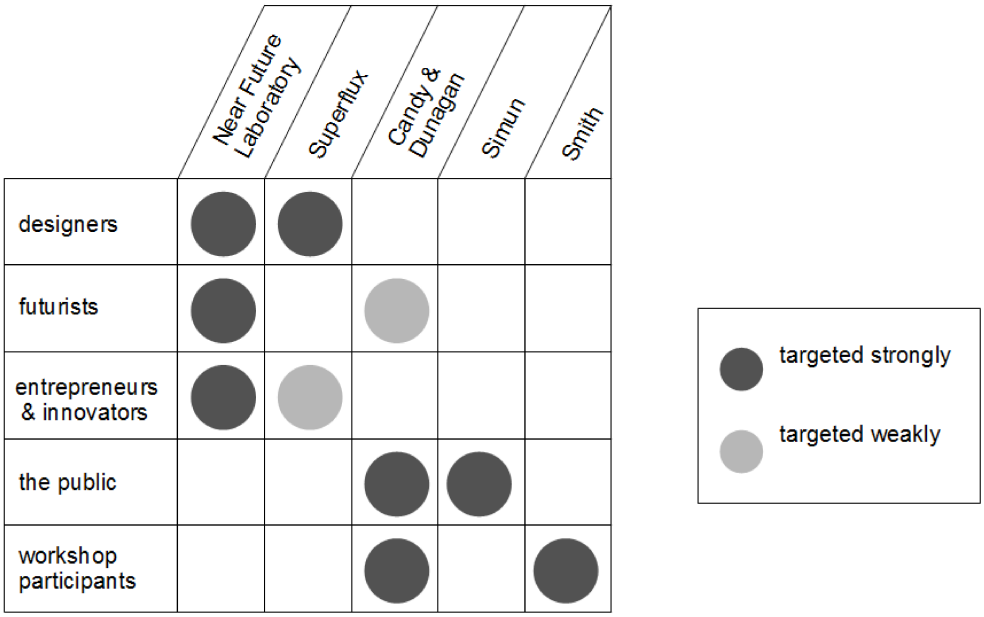


Figure 24: Intended audiences

Of note here is mainly just the divergence of audiences: Candy/Dunagan and Simun's interest in engaging the public, versus the Near Future Laboratory's emphasis on experts, versus Superflux's interest in reaching other designers in the tradition of critical design.

4.2.5 Points of differentiation

The majority of section 4 has been spent discussing common themes among the practices. This final section serves to round things out by briefly summarizing the features that most distinguish each practice within the context of the five practices considered.

The Near Future Laboratory is the only practice that focuses exclusively on digital technology and culture and the creation of working electronic prototypes. It is also the only practice whose conceptual framework draws heavily upon the interplay between science fiction and science fact (see Bleecker 2009). The time-frame under consideration is the “near future”.

Superflux is unique in that it also operates as a professional design consultancy. Superflux shares with the Near Future Laboratory an interest in the future of digital technology and culture, but the focus seems to be more strictly on design and less on the development of functioning prototypes.

Candy and Dunagan's practice has its theoretical basis in the discipline of futures studies, and a corresponding emphasis on improving futures thinking. Of the practices considered here, it expresses the greatest concern for the affective and sensory dimensions of experience, given its objective of having people feel, on a visceral level, what it might be like to live in a prospective future world. There is an emphasis on immersive experience, and some projects take the form of

unannounced interventions that rely on an element of surprise. The time-frame under consideration tends to be relatively long, from 20 – 40 years.

Simun's practice is not explicitly concerned with the future at all. She views her work as putting forth propositions that could equally well represent alternate presents. There is an emphasis on creating immersive experiences.

Smith's is the only practice that by definition takes the form of a participatory workshop where the participants are involved in creating prototypes of speculative artifacts, and also the only practice whose outputs take the form of low-fidelity mock-ups assembled quickly from readily available materials.

4.3 Putting the pieces together

The questions posed in section 1 will now be addressed by assembling what has been discussed in section 4.2.

Why the emphasis on material representations in particular? In what ways are material representations of particular use in working with possible futures? Primary for all of these practices is the belief that material representations are a powerful means for enabling humans to work with possibility. The phrase *working with possibility* is used to stand in for several aspects of the relationship between humans and the possible worlds with which they contend, including 1)

the notions of breadth and depth (as per Candy) of possibilities (awareness of the the variety of possibilities, and the level of detail of our knowledge of a given possibility); and 2) manipulation of the often rigid and fixed line between that which seems “possible” and that which seems “impossible”. Material representations are used to add depth and substance to what might otherwise seem ephemeral, offering a sense of what it might feel like to live in a given world (1), and to blur the line between the speculative and the real, allowing the “impossible” to seem possible or perhaps even probable (2). Material prototyping is also used to enable hands-on seeking out and discovery of new possibilities. The combined effect is one of opening up mental space for alternatives to current reality and the “official future”.

Beyond working with possibility, practitioners see material representations as a means to enrich communication around speculative worlds, and in so doing, deepen stakeholders' engagement in the foresight process. Material representations facilitate discussion of speculative entities, both among stakeholders, and between practitioners and stakeholders, by giving concrete form to the abstractions of language. They deepen stakeholders' insight into speculative worlds by engaging the sensory and emotional dimensions of their experience. This helps to get them involved in and excited about the work of foresight, possibly inducing them to care about a subject that might not otherwise be of interest. Material representations may even make it possible to reach audiences that simply could not be reached through traditional methods.

Yet another means of deepening engagement afforded by material representations is to have stakeholders participate directly in a process of designing and creating prototypes for elements of possible future worlds. This forces them to consider more carefully the nuances of a given scenario, and reinforces in them a sense of their own role in creating the future.

What are the key motivations underlying these practices? What are practitioners hoping to achieve? Section 4.2.3 provides the makings of a shortlist. While none of the practitioners identify themselves as being engaged in the creation of art *per se*, much of this work shares with art the desire to provoke, to disrupt conventional perceptions and call for a rethinking of conventional mindsets; to intervene in imaginaries, be it that of a small workshop group or in a larger cultural context; to offer up alternative possibilities as both a means of critiquing what is and seeding vision as to what could be. It seeks to contribute to social change by affirming the agency of all involved, reminding us of both our power and our responsibility to shape our futures.

Where do these practices fit within the larger contexts of the design and futures disciplines? Considering first the context of design, the distinction between the design-orientation and the experience-orientation (developed in 4.2.2) must be taken into account. Those practices dominated by a design-orientation can be readily understood as extensions of the notion of prototyping, but with differences

in parameters and intent. Parameters refers to the far greater license to design for a speculative world as opposed to the world of the “here and now”. Intentions are varied, but clearly they are discursive rather than utilitarian. In contrast, those practices dominated by an experience-orientation don't function as prototyping practices, but they do share the discursive intent. With respect to discursive intent, it is difficult to make any generalizations as to how these practices (both design- and experience-oriented) differ from more long-standing speculative and discursively-oriented design practices. Certainly some have much in common with the critical design of Dunne and Raby, for example, if merely in the sense that speculative alternatives to current reality are manifest in designed objects. Yet each practice differs in its conceptual framework and overall emphasis. Whereas critical design is intended primarily as a critique of commercial design (Dunne [1999] 2005), these practices (with the exception of Simun's) take “the future” as their primary object of interest, and where critique plays a role it tends to be secondary.

In the context of futures, it must first be noted that only two of the practices – experiential futures and future fabbing – have been explicitly conceived of and deployed as foresight methods. However, others such as design fiction and design futurescaping could potentially function as creative foresight methods if deployed as such. Considered in terms of Popper's typology of *creativity*, *interaction*, *evidence* and *expertise* (described in 2.1), all of the practices rely heavily on the *creativity* capability, and to varying degrees, the *interaction*

capability. The *creativity* capability dominates strongly in each case because the practice relies heavily on the ingenuity and skill of a few individuals, be they the workshop participants (as in the case of future fabbing) or the practitioners themselves (as in the other cases). In all cases, there is an element of *interaction*, be it between collaborating practitioners, participants in a workshop, or those who experience and discuss the work. Elements of *evidence* and *expertise* are incorporated too in each case, in the form of research, weak signals, and knowledge of science. Placed in Popper's Foresight Diamond, the practices would be proximate to *science-fiction*, *essay/scenario writing, role-play/acting* and *scenario workshops*.

The practices can also be considered with respect to Inayatullah's typology (described in section 2.1) which divides the futures discourse into the predictive, the cultural, and the critical. While the practice of creating material representations of speculative worlds is not intrinsically tied to any of these perspectives, it is difficult to imagine it being employed to gain predictive or empirical insight. At the very least, the five practices considered here employ materialization of the speculative in ways that are more compatible with the cultural and critical perspectives, probing culture and asking us to question the way things are, focusing less on anticipating the future and more on the creation or elaboration of alternatives.

As for why these practices are emerging now in the disciplines of design and futures, several hypotheses were advanced in section 2. From the design perspective, it was proposed in 2.1 that the increasing accessibility of tools for creating, sharing, discussing and debating design fictions is creating an increased interest in discursively-oriented design practices. This hypothesis was not pursued further in the context of this work, and would make a good candidate for further research. From the futures perspective, it was proposed in 2.2 that the increasing recognition of the need for reflexivity in futures, and the corresponding recognition of design as a future-shaping force, has prompted foresight practitioners to look toward design methodology. This hypothesis was not strongly supported by evidence from practitioner interviews. Of the two practices (experiential futures and future fabbing) that have been explicitly deployed as foresight methods, only the latter can be said to draw *design for* a speculative context (the design-orientation) into the foresight process. Experiential futures, while it makes use of design methods in the creation of experiential scenarios, has more of an experience-orientation, and is best understood as a means for deepening stakeholders' engagement with the various scenarios explored during a foresight process. While an experiential scenario may certainly inspire participants to reflect on their role in creating their future, this is not an inherent property of the method any more so than it is for traditional scenarios. Whether there will be more uptake of design-oriented practices as formal foresight methods remains to be seen.

5 Conclusions

5.1 Summary

This research project began with the recognition of a set of emerging practices in futures and design, each concerned in some way with the materialization of the speculative, and set out to inquire into this trend, and to understand the methodological possibilities offered by these practices. Insight was developed through literature review and an in-depth study of five specific instances of practice, whose commonalities and differences were considered from the four perspectives of product, process and roles, motivations, and intended audience. From these investigations, a number of conclusions were drawn about the way these practices work and how they are being employed, discussed in detail in section 4.3. To summarize these conclusions in brief here, these practices are being employed to:

1. Enhance our capacity to *work with possibility*, by adding depth and detail to scenarios, and blurring the lines between the speculative and the real.
2. *Seek out new possibilities* by taking an open-ended, exploratory design ethos into the realm of designing for highly speculative worlds.
3. Increase *engagement* of audiences, both narrow and broad, with foresight processes and outcomes, by enriching the *communication and exchange* of speculative ideas.

4. *Provoke*, *disrupt*, *critique*, and propose alternative *visions* of the future.
5. Enable and affirm individual *agency* with respect to the design and creation of the future.

Each of the above points represents a possible application for materialization of the speculative as method.

It is worth taking a moment here to consider these applications in light of the rather daunting global challenges currently faced by humanity. It may be tempting to think that materialization of the speculative does not stand up as a *serious* design or foresight method in the face of *serious* design and foresight challenges. A serious design method, one might argue, would offer some means of articulating a problem, evaluating available data about its conditions, and prescribing, based on the data, some form of resolution. A serious foresight method would tell us something well-substantiated about the possible, and ideally, the probable ways our world might look in the future, and thus provide us with some insight into how we ought to act in the present in order to adapt to or avoid a particular scenario. To simply "materialize the speculative" accomplishes none of the above.

Yet, to look at it this way is to miss what is offered. As the above list suggests, materialization of the speculative offers methods not for operating on problems *per se*, but rather for enhancing the abilities of humans and human systems to work with those problems. It is about enabling the human mind to work with

possibility – the apprehension, understanding, and evaluation of possibilities – and how we might make better decisions in the present by having a more complete sense of the alternatives and engaging more fully with each. It is about questioning and perhaps challenging the most fundamental assumptions upon which problem definitions are founded, so as to create new possibilities by seeing the familiar with new eyes. It is a means of catalyzing discourse around possible futures and the design of those futures, by facilitating the communication and exchange of speculative ideas, and disrupting cultural imaginaries with new, perhaps provocative incarnations of possible worlds, or new design concepts that embody ideas about alternative ways that the world could be. It is about how to get more people more deeply engaged in thinking about their futures and the role of their own agency in shaping them. It is ultimately about understanding that the course of the future is influenced in no small part by the collective thoughts, understandings, beliefs, values and practices - in short, the human cultures - that are behind it. This is essentially a restatement of Meadows' proposition that cultural paradigms are one of the greatest leverage points for effecting change in a system, a proposition that seems to be assumed by Nelson in his statement that the challenges of our particular moment in history require us to “develop the capacity to engage consciously in the evolution of existing human cultures” (Nelson 2010:3). If we accept Nelson's view, then we must seek out and develop methods that help us to engage in this evolution. Materialization of the speculative appears to offer a variety of means for such engagement.

5.2 Further research

This work leaves a number of jumping off points for further research, enumerated here.

The question of why these practices are emerging *now* was one of the main research questions posed in section 1. Several hypotheses were proposed in section 2 (and discussed further in section 4.3), but this question feels unsatisfactorily addressed and calls for further inquiry.

The notion of *cognitive estrangement* was mentioned briefly in section 4.1.2, in conjunction with science fiction. The role of cognitive estrangement (and related notions like the *Verfremdungseffekt*) in materialization of the speculative is in need of further elaboration.

Section 4.2.1 focused on the question of why a speculative world expressed through material artifacts might be experienced as more “real” than one expressed verbally or through other media. The suggestion was made, drawing upon the ideas of Gibson, that completeness of perceptual information plays a large role in experiencing an object or world as “real”, and that materialization simply offers more complete perceptual information than other representations can. This hypothesis was made tentatively, and remains to be thoroughly investigated. Along these lines, psychologists have found that an object

represented pictorially is experienced as being psychologically closer[1] than if it were described verbally (Amit, Algom and Trope 2009). Among the reasons given for this finding is that pictures are subject to the same perceptual processes that would be applied directly to the referent objects, and the very act of perception implies to the perceiver a sense of physical presence. Perhaps this type of experimental work could be generalized to show that a tangible object is experienced as being psychologically closer than the same object represented in an image. Moreover, the whole question of what makes simulated experiences "real" deserves deeper consideration. Phenomenology would seem to be a natural starting point here, and recent scholarship around virtual reality and telepresence (e.g. Lombard and Ditton 1997) might have much to contribute as well to this understanding.

Section 4.2.2 looked at the processes followed by the practices, but did not consider in-depth the methods used by each practitioner. A deeper consideration of methods would make a good candidate for subsequent research. This section also considered the roles of production and consumption, and these were found to be more complex than they perhaps initially appear. This topic ties in to questions of intended audience and the means by which the work is disseminated to reach that audience, all of which remain to be further explored.

[1] The phrase *psychologically close*r refers here to the notion of *psychological distance*, defined as "a subjective experience that something is close or far away from the self, here, and now." (Trope and Liberman 2010:440)

As Sterling has pointed out, the notion of “relational aesthetics” may be of interest here (Sterling, personal communication 2011).

Section 4.2.3 considered material objects as signifiers, and asked how much the first-hand physical experience of the materiality of these objects contributes to the power of their signification. The above question of what makes experiences “real” may have implications here.

In section 4.3, it was noted that the evidence considered in this study has not shown much uptake of material design-oriented practices in formal foresight methodology. In what ways might the act of designing for a speculative context help stakeholders to explore and understand possible futures? Understanding the utility of such practices as foresight methods, and how they might be developed and employed, presents a significant opportunity for further research.

From a methodological perspective, one of the key limitations of this work is that data gathered through practitioner interviews, while providing much insight into the workings of these practices and practitioners' motivations, does not provide a sense of the efficacy of these practices in achieving the desired objectives. More empirically-based investigations could be useful in addressing this.

And finally, another possible research direction, of particular interest to the author, would be to investigate further the potential correspondence between the

forms of designed objects and systems, and the cultures that design and use those systems. Perhaps Inayatullah's CLA method, which analyzes issues in terms of four layers – litany, social causes, discourse/worldview, and metaphor/myth (Inayatullah 1998) – would be useful too as a framework through which to analyze existing or proposed designed systems. Might we, through such analyses, increase our capacity to recognize culture manifest in the forms and structures of our designs? And if so, can speculative designing help us to foresee?

6 Bibliography

Amit, E., Algom, D., & Trope, Y. (2009). Distance-dependent processing of pictures and words. *Journal of Experimental Psychology: General*, *138*(3), 400-415.

Bleecker, J. (2007a). PSX. *Near Future Laboratory*. Retrieved January 6, 2012, from http://nearfuturelaboratory.com/projects/psx/

Bleecker, J. (2007b). Slow Messenger. *Near Future Laboratory*. Retrieved November 30, 2011, from http://www.nearfuturelaboratory.com/projects/slowmessenger/

Bleecker, J. (2009). Design Fiction: A Short Essay on Design, Science, Fact and Fiction. Retrieved November 21, 2011, from http://www.nearfuturelaboratory.com/2009/03/17/design-fiction-a-short-essay-on-design-science-fact-and-fiction/

Bleecker, J. (2010). Design Fiction Panel at SXSW 2010. Retrieved November 21, 2011, from http://www.nearfuturelaboratory.com/2010/03/18/design-fiction-panel-at-sxsw-2010/

Buchanan, R. (1992). Wicked problems in design thinking. *Design Issues*, *8*(2), 5-21.

Burr, V. (2003). *Social constructionism*. Routledge.

Candy, S. (2006). “Hawaii 2050” kicks off. *The Sceptical Futuryst*. Retrieved November 20, 2011, from http://futuryst.blogspot.com/2006/08/hawaii-2050-kicks-off.html

Candy, S. (2007a). Found futures. *The Sceptical Futuryst*. Retrieved December 2, 2011, from http://futuryst.blogspot.com/2007/05/found-futures.html

Candy, S. (2007b). McChinatown. *The Sceptical Futuryst*. Retrieved December 28, 2011, from http://futuryst.blogspot.com/2007/10/mcchinatown.html

Candy, S. (2008). The compleat Wired future artifacts gallery, 02002. *The Sceptical Futuryst*. Retrieved November 20, 2011, from http://futuryst.blogspot.com/2008/09/compleat-wired-future-artifacts-gallery.html

Candy, S. (2010, June 1). *The futures of everyday life: Politics and the design of experiential scenarios*. PhD dissertation, Political Science, University of Hawaii at Manoa.

Candy, S. (2011). The legacy of the Biofuture Robot Dog. *The Sceptical Futuryst*. Retrieved December 2, 2011, from http://futuryst.blogspot.com/2011_01_01_archive.html

Clute, J., Langford, D., & Nicholls, P. (2011). Definitions of SF. *Encyclopedia of Science Fiction*. 3rd edition (online). Retrieved from http://sf-encyclopedia.com/entry/definitions_of_sf

De Bono, E. (1973). *Lateral thinking: creativity step by step*. Harper & Row.

Dilnot, C. (2008). The Critical in Design (Part One). *Journal of Writing in Creative Practice*, *1*(2), 177-189.

Diodato, V. P. (1994). *Dictionary of bibliometrics*. Routledge.

DiSalvo, C. (2009). Design and the Construction of Publics. *Design Issues*, *25*(1), 48-63.

Dourish, P., & Bell, G. (2009). Resistance is Futile: Reading Science Fiction Alongside Ubiquitous Computing. *Personal Ubiquitous Computing*, (forthcoming).

Dunne, A. (2005). *Hertzian Tales*. Cambridge, Ma.: MIT Press.

Dunne, A., & Raby, F. (2001). *Design Noir: The Secret Life of Electronic Objects*. Birkhäuser Basel.

Gaskell, G. D. (2000). Individual and Group Interviewing. In M. W. Bauer & G. D. Gaskell (Eds.), *Qualitative Researching with Text, Image and Sound: A Practical Handbook for Social Research* (pp. 38-56). Sage Publications Ltd.

Gibbs, G. R. (2008). Thematic coding and categorizing. *Analysing Qualitative Data* (pp. 38-46). Sage Publications.

Gibson, J. J. (1979). *The ecological approach to visual perception*. Houghton Mifflin.

Grand, S., & Wiedmer, M. (2010). Design Fiction : A Method Toolbox for Design Research in a Complex World. *Design Research Society*. Retrieved from http://www.designresearchsociety.org/docs-procs/DRS2010/PDF/047.pdf

Harold, C. (2004). Pranking rhetoric: “culture jamming” as media activism. *Critical Studies in Media Communication*, *21*(3), 189-211.

Heim, M. (2000). *Virtual Realism*. Oxford University Press; New edition edition.

Houde, S., & Hill, C. (1997). What do prototypes prototype. *Handbook of Human-Computer Interaction* (2nd ed., Vol. 2, pp. 367–381). Elsevier Science Pub Co.

Inayatullah, S. (1998). Causal layered analysis: Poststructuralism as method. *Futures*, *30*(8), 815-829. Retrieved from http://www.metafuture.org/Articles/CausalLayeredAnalysis.htm

Inayatullah, S. (2004). Deconstructing and Reconstructing the Future: Predictive, cultural, and critical epistemologies. In S. Inayatullah (Ed.), *The Causal Layered Analysis (CLA) Reader* (pp. 55-83). Tamkang University Press.

Jain, A., Ardern, J., & Pickard, J. (2011). Design Futurescaping. *Blowup: The Era of Objects (Blowup Reader #3)* (pp. 6-14). V2_Presents. Retrieved from http://www.v2.nl/events/blowup-the-era-of-objects

Johsnon, B. D. (2009). Science Fiction Prototypes Or : How I Learned to Stop Worrying about the Future and Love Science Fiction. *Intelligent Environments*.

Johnson, B. D. (2011). *Science Fiction Prototyping: A Framework for Design*. Morgan & Claypool Publishers.

Kirby, D. (2009). The Future is Now: Diegetic Prototypes and the Role of Popular Films in Generating Real-world Technological Development. *Social Studies of Science*, *40*(1), 41-70.

Lombard, M., & Ditton, T. (1997). At the Heart of It All: The Concept of Presence. *Journal of Computer-Mediated Communications*, *3*(2). Retrieved from http://jcmc.indiana.edu/vol3/issue2/lombard.html

Lukic, B., & Katz, B. M. (2010). *Nonobject*. MIT Press.

Manos, M. (2011). Impractically, Practical. Retrieved November 20, 2011, from http://issuu.com/mattmanos/docs/impracticallypractical

Maze, R., & Redstrom, J. (2007). Difficult Forms : Critical Practices of Design and Research. *International Association of Societies of Design Research* (pp. 1-18). The Hong Kong Polytechnic University.

Meadows, D. H. (2008). *Thinking in Systems: A Primer*. Chelsea Green Publishing.

Milojević, I. (2002). A Selective History of Futures Thinking. *Futures of Education: Feminist and Post-Western Critiques and Visions*. PhD Thesis, School of Education, The University of Queensland.

Nelson, R. (2010). Extending foresight: The case for and nature of Foresight 2.0. *Futures*, *42*(4), 282-294.

Pang, A. S.-K. (2006). Artifacts from the future. *IFTF's Future Now*. Retrieved August 26, 2011, from http://future.iftf.org/2006/06/artifacts_from_.html

Popper, R. (2008). Foresight Methodology. In L. Georghiu, J. C. Harper, M. Keenan, I. Miles, & R. Popper (Eds.), *The handbook of technology foresight: concepts and practice* (pp. 44-88). Edward Elgar Publishing.

Ramos, J. M. (2006). Consciousness, culture and the communication of foresight. *Futures*, *38*(9), 1119-1124.

Rittel, H. W. J., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy sciences*, *4*, 155-169.

Russell, B. (1997). *The Problems of Philosophy*. Oxford University Press, USA.

Saffer, D. (2009). Prototyping, Testing, and Development. *Designing for Interaction: Creating Innovative Applications and Devices* (2nd ed., pp. 169-192). New Riders Press.

Slaughter, R. A. (1995). *The Foresight Principle: Cultural Recovery in the 21st Century*. Praeger Paperback.

Sterling, B. (2005). *Shaping Things* (p. 152). The MIT Press.

Sterling, B. (2006a). Speaking at California College of the Arts. (video). Retrieved November 21, 2011, from http://fora.tv/2006/09/26/Bruce_Sterling

Sterling, B. (2006b). *Visionary in residence: stories*. Running Press.

Sterling, B. (2009). Design Fiction. *Interactions*, *16*(3).

Suchman, L., Trigg, R., & Blomberg, J. (2002). Working artefacts: ethnomethods of the prototype. *The British journal of sociology*, *53*(2), 163-79.

Tester, J. (2007). The case for human-future interaction. *IFTF's Future Now*. Retrieved November 19, 2011, from http://future.iftf.org/2007/02/the_case_for_hu.html

Thompson, J. B. (1984). *Studies in the theory of ideology*. University of California Press.

Trope, Y., & Liberman, N. (2010). Construal-Level Theory of Psychological Distance. *Psychological Review*, *117*(2), 440-463.

Wodiczko, K. (1999). *Critical vehicles: writings, projects, interviews*. MIT Press.

7 Appendices

7.1 Appendix A: Interview protocol

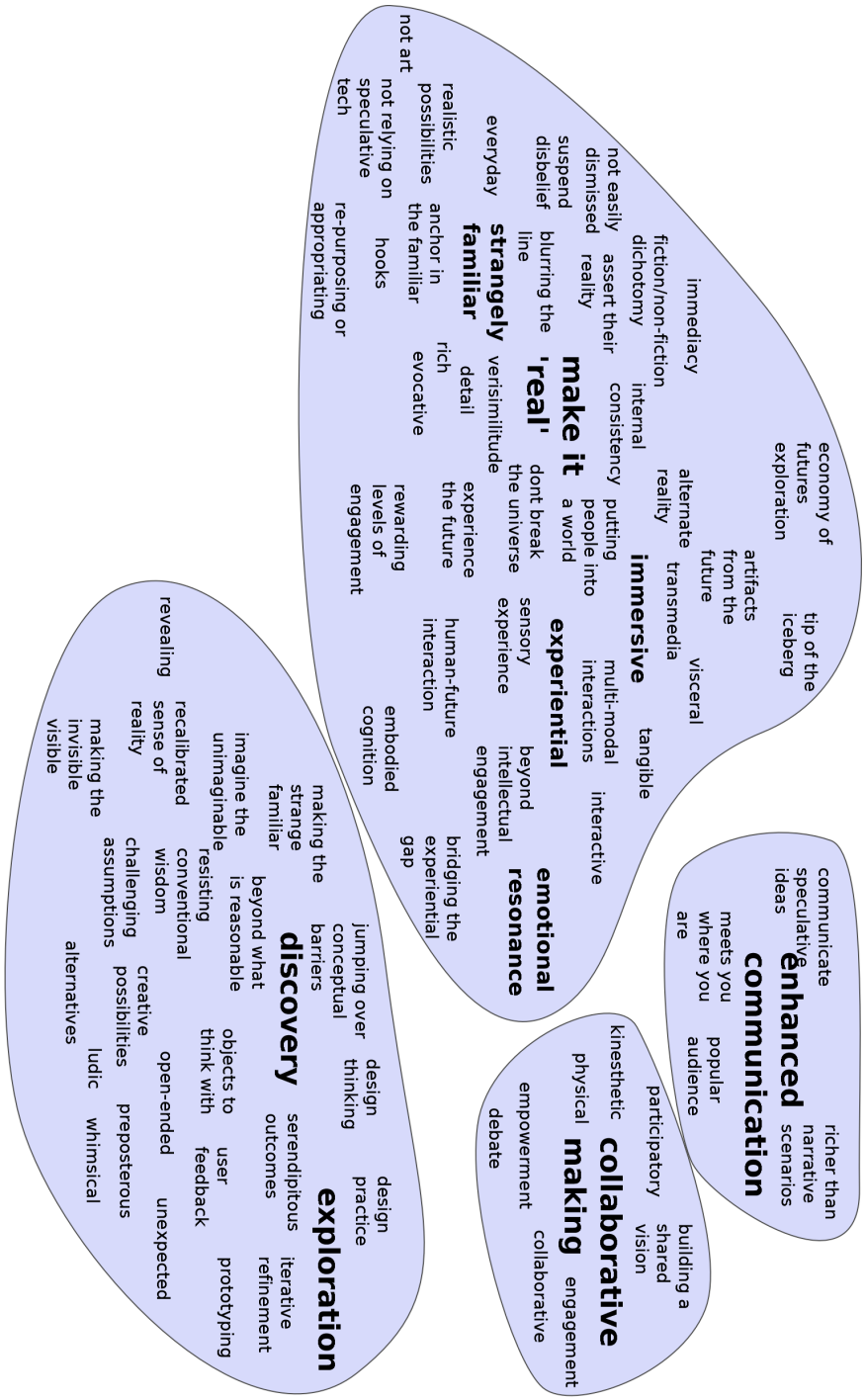
- How do you refer to your work? What's the history of the term?
- Why do you this work? Why is it important to you to do this kind of work? What is it ultimately that you hope to accomplish?
- Who are you trying to reach with your work? Who is your intended audience?
- And what effect do you hope your work will have on them?
- What role does the choice of medium play in your work?
- What is the role of 'making' in your work?
- What is the role of 'story' in your work? Do you think that stories play a large role in shaping the future?
- Do you see your work as political? Or as having a political dimension to it?
- How do you characterize the success of a project?
- What do you see as your most effective piece of work, and why?
- Whose work do particularly admire? Do you have any favourite pieces or practitioners? Who has influenced you?

7.2 Appendix B: Interview records

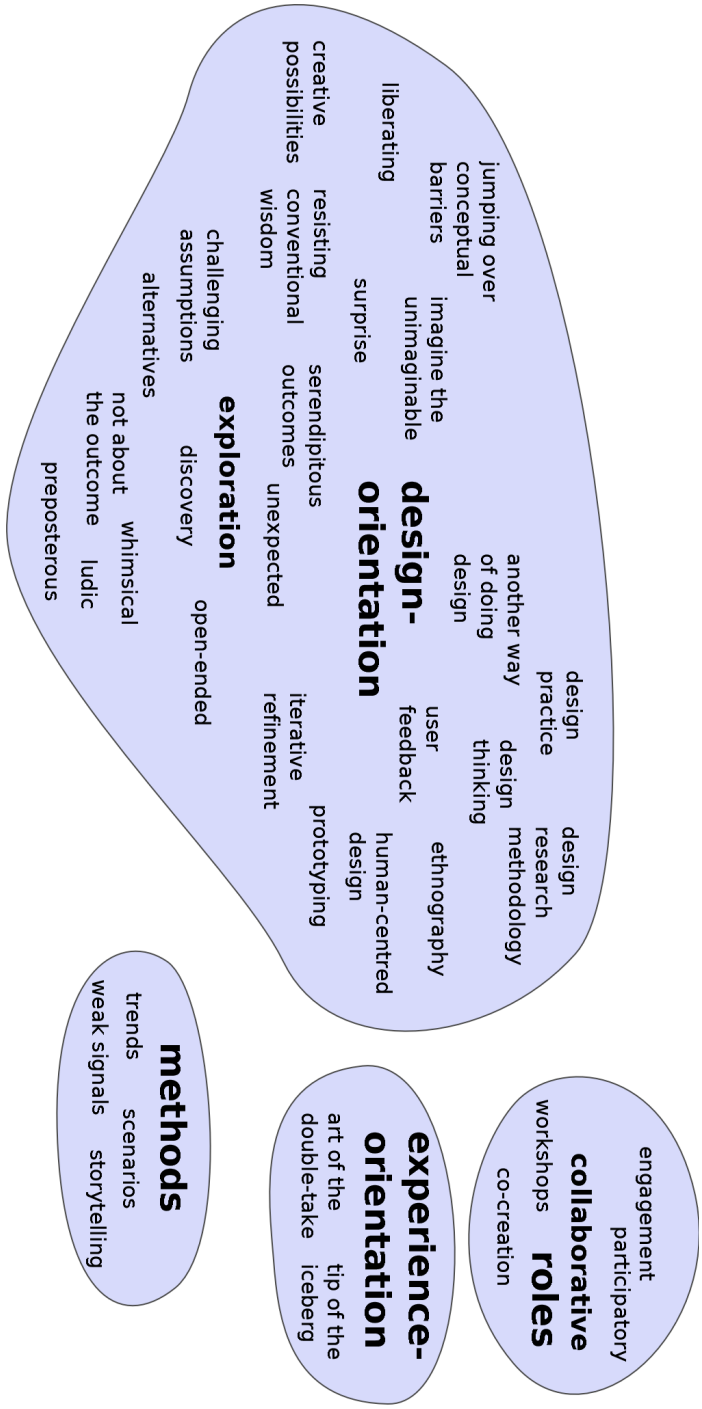
Practitioner	Type	Date
Scott Smith	Voice	2011-07-29
Nicolas Nova	Voice	2011-08-23
Julian Bleecker	Voice	2011-08-26
Anab Jain	Voice	2011-08-30
Jake Dunagan	Voice	2011-09-21
Stuart Candy	Voice	2011-09-27
Bruce Sterling	Email	2011-10-24
Miriam Simun	Voice	2011-10-25

Table 3: Practitioner interviews

7.3 Appendix C: Product theme map



7.4 Appendix D: Process theme map



7.5 Appendix E: Motivations theme map