Everyday Futures

Speculative Thinking in the Domestic Sphere

2014

Thesis
Documentation

Yian Ling Cheong
Masters of Interaction Design

Aisling Kelliher
Advisor

Carnegie Mellon University

Everyday Futures

Speculative Thinking in the Domestic Sphere

A thesis submitted to the School of Design,
Carnegie Mellon University, for the degree of
Master of Design in Interaction Design.

Yian Ling Cheong   Date
Master of Design 2014

Aisling Kelliher   Date
Associate Professor, School of Design
Carnegie Mellon University

Acknowledgements

Contents

1 Abstract

In this paper we introduce the idea of everyday futures, which include people's dreams, goals, wants and needs both in the near and distant future. These everyday futures can be embodied as digital, physical and hybrid artifacts and have a rich variety of qualities and associated behaviors. To investigate, we conducted a large online study and in-depth interviews exploring how people embody and interact with their everyday future ideals. Initial findings reveal five experiential stages of everyday futures and point towards opportunities to enrich the futuring process.

Besides personal futuring in the domestic sphere, futuring is also professionally practised by futurists and speculative designers. In this paper, we explore how future studies and design methods can be support everyday future-oriented thinking, by introducing the Manoa method and design fiction method to a small group of participants over eight weeks. The results indicate success and challenges that can offer value to speculative and interaction designers.

2 Introduction

From a young age, children learn to think about the future. We save up for a rainy day, make birthday wishes, or think about what we want to be when we grow up. As we move into adulthood, we continue to think about the future all the time - we plan for the day ahead, fill up the calendar with appointments, look forward to the next vacation, dream about retiring young, or even speculative what happens after life.

In this paper we introduce the idea of everyday futures, which encompasses people's dreams, ambitions, goals, wants, plans and needs both in the near and distant future. While some of these everyday futures are only thoughts in our mind, many of them are also expressed through artifacts, such as wishlists, bucket lists, coin banks, photographs, and planners. A rich variety of experiential qualities and associated behaviors are embodied in these digital, physical and hybrid artifacts. A larger number of tools and applications (e.g. Mint.com, Amazon wishlist, Getting things done workflow, Google calendars) available in the market are targeted at helping people in their near term planning, but there are fewer examples that consider long term futures. Most of the tools are heavily efficiency-focused, emphasising success and fulfillment of goals. Apart from the pragmatics of future planning, we see opportunities in examining other experiential qualities in everyday futures, such as imagination, reflection, curiosity, and exploration of self. Instead of focusing on goal-getting, we would like to enrich the speculative process of everyday futures with those qualities.

At the same time, futuring is also carried out as a profession. Futures practice involves a clear understanding of the present, a projection of vision(s) of the future, and an examination of the potential consequences. Researchers, engineers, science fiction writers, futurists, designers and other future-focused professionals - each play a different role in this timeline of future creation. Our research focuses on expanding the scope of future studies within the context of a particular form of speculative design practice. Futures studies is a scientific research discipline which adopts a pluralistic approach to envision possible, probable and preferable futures (Bell, 1997). It contemplates multiple futures to reveal conflicting visions and facilitate dialogue around them. Methods used by futurists are known to be systematic, rigorous and expert-led. Designers engaged in speculative design practices tackle similar problems as futurists, but with a critical or edgier angle. They do not try to predict or forecast the future, but instead suggest ideas about what the future might be like (Dunne & Raby, 2013). These ideas do not solve problems, but instead pose questions which are intended for open debate and discussion. Methods employed by speculative designers are imaginative, technology-focused, and critique-based. Both futures studies and speculative design practice have been successful in channeling so-called wicked problems (Rittel, 1973), and are intended to instigate debate and discussion among diverse

populations. However, the outcomes from futures studies and speculative design work are most commonly encountered in text-based reports and galleries respectively. Consequently, the conversations around those interactions are primarily taking place between a relatively selective or expert group of individuals. There is scant documented evidence that the research generated has reached a broader set of people dealing with the future as part of their everyday lived experience.

As futurists, designers, and non-experts alike carry out futuring activities on distinct yet related paths, we are interested in discovering the areas of overlap and integration between futures in the professional realm and the domestic sphere. Futures oriented thinking in the domestic sphere can be enriched by adapting methods, used professionally in both disciplines. At the same time, futurists and designers can also expand the reach and impact of their work with opportunities to engage a wider variety of audience.

Our research describes a series of studies designed to understand how non-experts think, conceptualize, and embody ideas about the future. We begin with a large scale general survey inquiring into how multi-cultural individuals embody their future goals via physical and digital artifacts. From this endeavor to create a taxonomy of future-oriented goals and their material expression, we move to an in-depth home-based study with a targeted group of individuals. This study aims to provide rich 'thick descriptions' of contemporary approaches to domestic futuring. Insights gleaned from this study lead us to our final exploratory study where we introduce methods from futures studies and speculative design practice into a small group of selective home environments over a number of weeks. The results and findings from our studies indicating the successes and challenges of integrating structured, professional methods into the domestic environment can offer value for design researchers, design fiction practitioners, and interaction designers who are interested in:

(1) exploring how futures and design methods can support everyday future oriented thinking
(2) extending design fiction beyond the gallery,
(3) creating participatory or co-design speculative practice,
(4) understanding how deeply personalized design can be an effective research method.

3   Related Work

The future, in essence, refers to a time that is still to come.   By itself, it does not mean much. However, once paired with a context, its meaning surfaces, for example, ''my future', or 'the future of our environment'. The 'future' is also often interpreted as a state or scenario, but in our research, we are more interested in the exploration process of the future, called 'futuring'. In our related work, we create a general understanding of how three different groups of people participate in futuring. First the futurists, who engage in trendwatching and scenario planning; then the designers, who embody ideas for the future in the material world; and finally ordinary people who think, plan and engage in diverse practices related to their own futures (Figure 1).
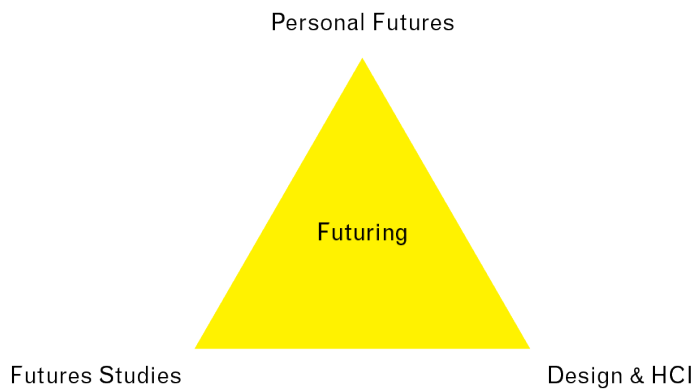
Personal Futures

Futuring

Futures Studies   Design & HCI

Figure 1: Scope of related work

3.1   Futuring in Futures Studies

Conceptualizing and representing visions of the future is typically the purview of forecasters, trend reporters, policymakers, writers, artists and moviemakers. Beginning in the 1960s, the discipline of futures studies proposed a multifaceted understanding of possible, probable and preferable futures through the development of alternative scenarios for 'how things could be' (Bell, 1997). Futurists are interested in tackling wicked problems on a global scale by studying how social, technological, economical, environmental and political forces shape the world. Most research produced by futurists is encountered as textual documents for supporting decision making in areas like government planning and large corporation strategy. More recently, future studies practitioners extended their activities to incorporate materials, methods and practices from design and the arts (Davies & Sarpong, 2013). HCI researchers also recognized that they could benefit from integrating systematic approaches

from futures studies with regard, for example, with long term thinking (Mankoff et al., 2013). We similarly see possibilities for integrating futures frameworks more generally into the domestic sphere. In our study, we explore how methods in future studies can not only tackle the wicked problems of the world, but also the wicked problem of the self.

3.2   Futuring in Design & HCI

The First and Second Wave of HCI primarily focused on utilizing engineering and cognitive science to optimize efficiency and functionality between man, machine and information in the workplace (Harrison et al., 2007). In the past decade, the Third Wave of HCI emerged and recognized that information and communication technology has spread beyond the workplace, and entered our homes and everyday lives (Wakkary & Maestri, 2007; Bell et al., 2003; Taylor & Swan, 2005). This shift in focus towards contexts of everyday life is also coupled with new research interests, encompassing elements such as culture, sociality, emotion and experience (Norman, 2004; Hassenzahl & Tractinsky, 2006).

The Third Wave also incorporated speculative approaches such as ludic design, ambiguous design, critical design, and design fiction (Gaver, 2001; Gaver et al., 2003; Dunne, 2000; Sterling, 2009). As designerly ways of thinking grew to be more valued, a part of a designer's job moved from thinking about what the next product 'should be' to imagining what they 'could be' (Zimmerman et al., 2007). Critical and speculative design practice and research is a fundamental part of this development, particularly within the realm of conceptualizing mid- and long- term futures. Dunne and Raby advocated the use of critical design more as an attitude to challenge present assumptions and ways of working, revealing possible future implications of science and technology in order to stimulate discussion and debate among people. Extending this future oriented design practice, Bruce Sterling and Julian Bleecker popularized another way of imagining the world through design fiction, which borrowed ideas and findings from science fiction combined with factual presentation (Bleecker, 2009). Design fiction is an explorative approach that seeks to extend speculation of the future. It chooses to inspect the future through the creation of prototypes from the future, called diegetic prototypes, accompanied with storytelling. These design fictions are typically presented via online media, e.g. Near Future Laboratory's Corner convenience, Curious Rituals and Superflux's Song of the Machine[1]. Common in all these projects is the desire to portray how technological futures will play a part in altering our everyday life.

Fitting with the idea behind the Third Wave of HCI, both critical design and design fiction approaches are gaining traction within HCI research (Mankoff et al., 2013; Tanenbaum, 2012) and point to the value of incorporating speculative and futures focused in interactive

---

[1] http://nearfuturelaboratory.com/projects/curious-rituals/;
  http://nearfuturelaboratory.com/projects/corner-convenience/
  http://superflux.in/work/song-machine

systems research. While these approaches generated a rich body of speculative physical and digital artifacts, they are primarily created by experts and encountered in gallery or exhibition spaces, with some exceptions like design fiction movies by Near Future Laboratory which are available online. Given that some of the stated overarching goals of this future focused work are to facilitate dreaming, provoke conversation and inspire imagination, an opportunity exists to extend the reach of this practice to a broader group of participants and audiences.

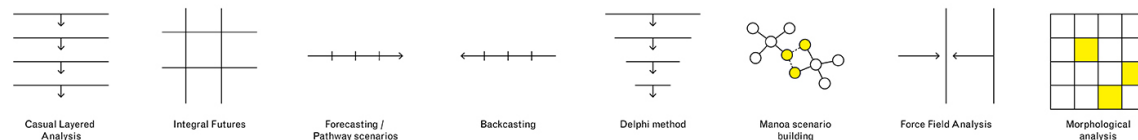## 3.3 Methods for Futures Studies, Design & HCI
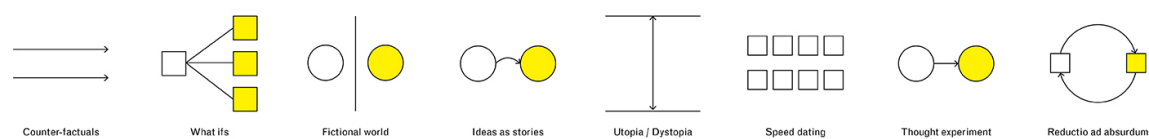
Figure 2: Summary of popular, forward looking methods used in Futures Studies and design, drawn primarily from (Mankoff et al., 2013; Dunne & Raby, 2013, Davidoff et al., 2007).

Methods used in Futures Studies is a big part of futurists' research because of the indeterminacy nature of the 'future'. To counter skepticism, futurists test and document their methods in different contexts (Curry & Schultz, 2009; Bishop et al., 2007), analyze the prospects of change (Miller, 2006), and based on that suggest a wider and deeper set of futures instead of predicting only one (Dator, 1998). Mankoff et al. completed an extensive survey and analysis of academic methods employed by futurists (Figure 2), which emphasize the field's systematic rigor in examining the past and present to derive insights on possible futures. This rigor is a result of being expert-led, close monitoring of the present world, sophisticated models of stimulation, and critical reflection. By applying one of the methods (Delphi) in their own research, the authors demonstrated how HCI methods can be enhanced by futures approaches. There is also one documentation of how futures studies methods have been translated into practical steps for everyday future-oriented practices (Wheelwright, 2006).

Speculative design, being a newer discipline, has yet to have similarly deep and extensive research into its methods. Speculative work tends to be more outcome-driven than process-driven, leaving little documentation about how an idea is formulated. However, speculative designers are beginning to see the need for such toolkits to be assembled (Dunne & Raby, 2013). Methods from adjacent fields, like critical design and HCI are commonly associated with speculative design. As a result, a designer's toolkit is enriched with methods that inspire ideas in less analytical, more generative ways to make imaginative leaps into the visions of the future (Gaver et al., 1996; Djajadiningrat et al., 2000; Blythe & Wright, 2006; Sanders & Stappers, 2012; Davidoff et al., 2007; Reeves, 2012).

These methods from future studies and design are primarily practised within academia and field experts. However, action research has shown examples of how such methods can be introduced to everyday people. The Utopia project demonstrates how participatory design can bring stakeholders together in the design process to solve their needs together (Ehn, 1988). Futures workshops brings people through a process of critique, fantasy and implementation (Müllert & Jungk, 1987). Superflux[2], a design practice, actively engages the public by inviting the public to their workshops, creating collaborative design environments. Critics raise concerns that participatory design is being conducted without its original intention of including direct stakeholders in the design process. Now, participants are often included to create 'multi-disciplinary' teams and they are not directly invested in the design issue. In our research, we aim to maintain the principles of participatory design and focus on how futures and design methods can inform the practice of Everyday Futures in the domestic sphere, by engaging individuals directly.

3.4 Personal Futuring in the domestic sphere

In our work, we concentrate on everyday futuring that happens in the domestic sphere, which includes individuals or groups of people living together in home environments. We define everyday people as non-specialists whose professional work is not planning for the future. These people carry out future-oriented thinking, in the form of plans, goals, daydreams, aspirations, hopes, worries, predictions, expectations and other scenarios which may or may not be realised in the future (Friedman & Scholnick, 1997).

Evidence that people are concerned about their future is shown in the popularity of self help books, financial and retirement planning, insurance policies s etc. For managing short term futures, there are applications like Evernote, Mint, Remember the Milk, Eisenhower, Asana, Wunderlist, just to name a few. All these tools and information are heavily influenced by research from business management (Allen, 2001; Drucker, 1954). Management leaders are very successful in translating rather dense theories into everyday practice. Their strong focus on achieving effectiveness, efficiency, productivity and success reminds people to prepare for

---

[2] http://superflux.in/

their future in an agile manner in order to minimize uncertainty. On the other hand, the recent trend over the Mindfulness movement advocates, 'Stopping worrying about the future. Focus on the present'[3]. No matter which stand a person takes, both schools of thought show that people are grappling to make sense of the future.

Concepts regarding an individual's future are often complex and highly dependent on each person. For example, there is no clear definition of 'near' and 'far' future, as both are relative concepts that vary from person to person. Because of the intricacies in the concept of the 'future', psychology researchers dissected it for deeper investigation. Research from cognitive psychology has an extensive understanding of future-oriented thoughts and behavior in areas such as planning, judgment and decision making, emotion, mental stimulation, optimism, accuracy and bias in prediction, personal beliefs, etc. (Aspinwall, 2005). People's motivation to carry out future planning is shaped by their life stage, events, belief, personality and external social trends (Wheelwright, 2006). People are also innately weak at thinking about long-term futures, as the brain naturally focuses on the present and near future (Mankoff et al., 2013). In developmental psychology, researchers examined future-orientation in the aspects of social and cultural psychology of time, value placed on past, present, future outcomes by young students and adults, dilemma between short and long term rewards, and also proactive management of aging, retirement and health (Aspinwall, 2005).

We can find strong theoretical representation from both business management and psychology research in practical everyday applications. Many of the books and tools in this arena are commercially marketable and have documented impact on diverse audiences. However, when we look to research from design, HCI and future studies, we find fewer examples with similar global reach and appeal.

PERSONAL FUTURING   FUTURING IN DESIGN & HCI   FUTURING IN FUTURES STUDIES
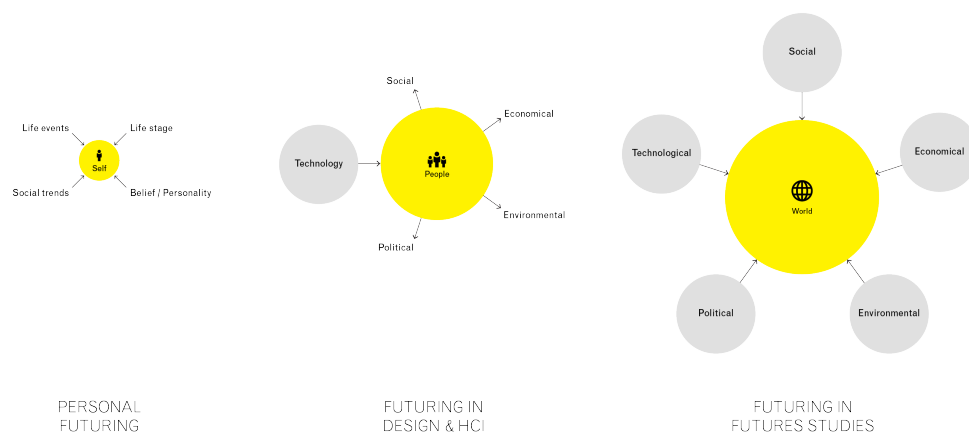
Figure 3: Summary of the scopes of futuring in domestic sphere and professional realm

[3] http://www.psychologytoday.com/articles/200810/the-art-now-six-steps-living-in-the-moment

From our related work review (Figure 3), we can see some opportunities for futures studies, design and HCI to play a part in everyday futures. Firstly, the Third Wave of HCI has already moved successfully to the domestic sphere. Academic methods from futures studies and design have also proven to be useful in thinking and exploring ideas of the future. There is a need to support personal futuring that can go beyond pragmatic considerations. Therefore, our research aims to investigate how the futuring needs of everyday people can be met by employing current and modified methods used in futures studies and speculative design. To scaffold our research, we plan to answer these questions:

1. How do everyday people think and plan for their future?
2. How do futurists and speculative designers think about the future?
3. How can the approaches used in future studies and speculative design play a role in the everyday practice of speculative thinking in the domestic sphere?

In the next section, we will describe the methods we use to investigate these questions.

4 Overview of Method

400 participants

Online Survey

12

Home Interviews

4

Manoa approach
3 weeks

4

Design Fiction approach
5 weeks
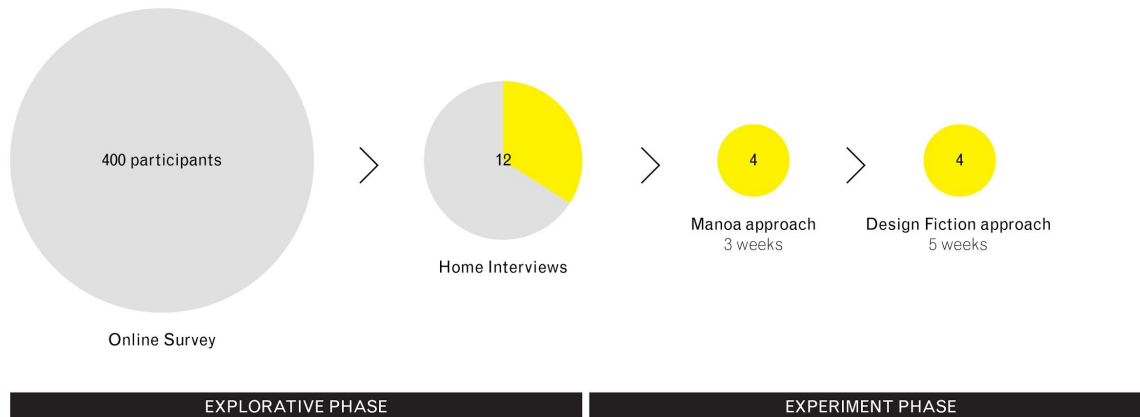
EXPLORATIVE PHASE

EXPERIMENT PHASE

Figure 4: Overview of method (explorative and experimental phase)

The study began with an exploration phase (Figure 4), to understand how people carry out personal futuring in the domestic sphere. First, we decided to use the lens of physical and virtual possessions to broadly examine how people embody their future aspirations. We decided to use a crowdsourcing platform to quickly derive a taxonomy of objects via a survey protocol. In addition to this initial exploration, we also wanted to more deeply understand particular practices around future oriented objects. We therefore conducted a series of in-depth home interviews and guided tours with participants in the Pittsburgh area. Following analysis of the data collected from this stage of our research, we selected four of our home interview participants to engage further with us on an experimental study. Over the course of several weeks, the four participants first employed a futures method instrument for considering their dreams and aspirations, followed by a custom-designed and personalized speculative design activity. The participants used diaries to document their experiences during this time, with additional interpretative data collected via debrief interviews at the conclusion of the study.

5 Explorative Phase - Survey

5.1 Method

The exploration phase started with an online survey on Mechanical Turk, as a quick way of gathering data from a wide variety of people. The survey's intent is to collect evidence that people manifest future intentions and thoughts through a large variety of artifacts. Participants completed a microtask of five phrasal templates describing an object (physical or digital), its location, its associated future ideal or goal, and whether the goal was individual or collective (Figure 5). Each participant was incentivized with a 25 cent payment when he or she completed the survey. Over the course of several days, 2000 artifacts were collected from 400 respondents. Of these responses, slightly over 50% were deemed relevant and of value to the study. The rest were either incomplete, irrelevant to the survey or incomprehensible.

Figure 5: Phrasal template used in online survey

5.2 Results

Our survey data revealed a range of physical, digital and intangible representations with verbal, visual, numeric, diagrammatic, 3D and pre-verbal properties (Table 1). The most common manifestations were verbal or text-based artifacts, ranging from to-do-lists, post-it notes and whiteboard messages for short-term goals, with journals, wishlists and bucket lists fulfilling longer term ambitions. Visual artifacts such as Pinterest collections or catalogs were evident in relation to future purchase goals or ideal travel destinations. Numeric artifacts were primarily associated with quite concrete, accountable goals such as weight loss or desired savings. Diagrammatic artifacts such as roadmaps and charts were frequently used when people had planned steps to reach their goal. Over a quarter of the identified artifacts were physical objects such as dirty clothes or a set of weights, which acted as contextual reminders to embark on a task (laundry) or represented a concrete commitment to pick up a

hobby or skill. A small number of pre-verbal, intangible artifacts were also mentioned, such as mental notes or ideas.

Property	Object
Numerical	Scoreboard, bank statements, calendar, contact book, budget sheet
Textual	Whiteboard, journal, post-it note, draft messages, emails, bookmark tabs, hyperlinks, google docs, word documents, mobile application, travel itinerary, spreadsheet, notepad, curriculum, timetable, wishlist, bucket list, to do list, checklist, planner, recipe, inspiration quote
Pictorial	Catalog, picture board, Pinterest board, shopping cart, photograph
Diagrammatic	Map, chart, flowchart, roadmap
Actual object (to name a few)	Money jar, Dress, set of weights, vintage car
Intangible	Mental note, idea

Table 1: Properties of objects collected from online survey

The overall future goals and ideals of the survey participants were organized according to 13 primary categories, with leisure, work, home, material consumption, health, money, self-improvement, food and travel as the leading classifications (Figure 6). Also evident to a lesser extent were future goals oriented around relationships, family, holidays and the environment.
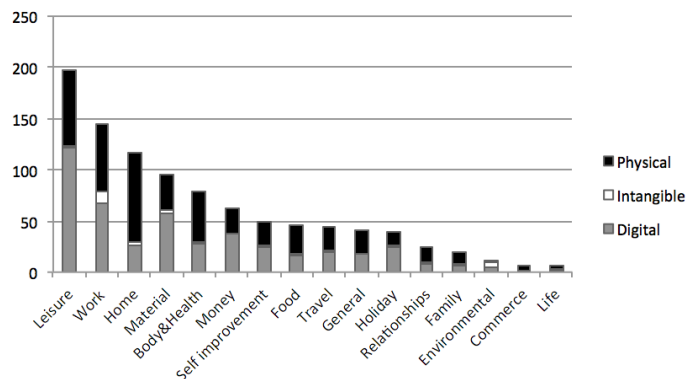

Figure 6: Categories of future goals collected from online survey

5.3 Findings

1   Objects represent initiative

Every object collected in the survey instrument embodies some sort of initiative that a user took to articulate their future goal. We notice three possible methods of initiation: (1) appropriated, (2) acquired with intention and (3) intentionally made.

Types of initiation	Examples
Appropriated	"There is a vacuum cleaner in my house to remind me to clean for the coming festival."
Acquired with intention	"There is a set of weights in my closet that I use towards my goal of getting healthier and stronger."
Intentionally made	"There is a written list on my mirror of books I want to read."

Table 2: Types of initiation represented by objects

Appropriation involves making associations between an object and a future goal. The object may be a direct representation (e.g. the bill to pay) or an abstract association (e.g. family photo as a reminder to call someone). People can also express their first commitment towards their future goals through acquisition of objects. Many examples (e.g. books to be read someday) show a need for further user effort and interaction with the object to achieve the initial goal. Besides appropriation and acquisition of objects, we found 63% of the objects were intentionally made. Although we did not ask for further description of each object, we suspect the effort spent on making these artifacts may vary greatly, e.g. a short reminder on a post-it note versus a spreadsheet of a financial budget for the year. The most common items made are lists in both digital and physical medium. The ease in creating lists and minimal resource commitment might be why it became the preferred method to articulate dreams and goals.

2   Small Task / Big Task / Material / Hobby / Habit / Skill / Ambition

The phrasal template was kept intentionally open-ended to survey the breadth of both the types of objects and the future goals they embodied. Our findings revealed that people differ in their interpretations of their 'future' in terms of scale, clarity and priority. Scale of future goals can range from small tasks, such as finish reading a book, to larger ambitions, like winning a tournament, to immeasurable aspirations, such as becoming a good father. A small and near term goal to a person might be considered as a lofty dream for another. This directly links to the clarity and priority of the goal as well. While the study did not require participants to spell out details, some responses were significantly more specific in quantity and time frame as compared to others, for e.g. making a million dollars in 5 years versus becoming rich. It is challenging to determine the scale of a future goal while coding due to perception differences.
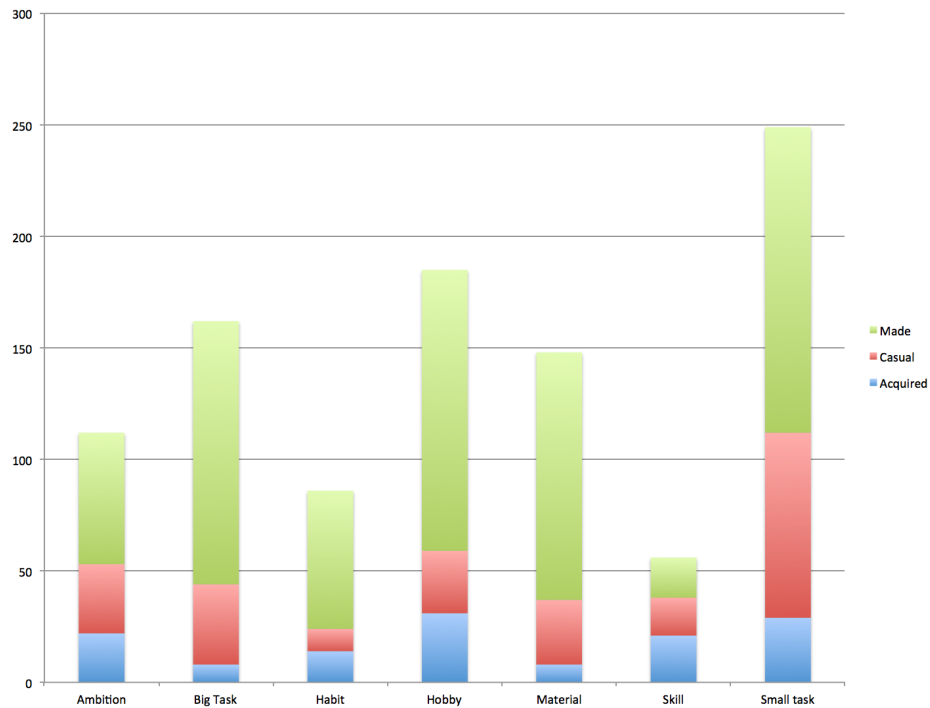
Figure 7: Scale of future goals

The survey supplied us with an extensive taxonomy of digital and physical artifacts, accompanied by their future goals. However, the short answers were not able to give us in-depth notions about the materiality, interactions and meaning (Shove et al., 2012) behind each artifact. Therefore, we conducted in depth interviews in people's homes so that they can show and share with us stories around each object.

6 Explorative Phase —
Home interviews

6.1 Method

To gather more detailed and verifiable information about future thinking in specific audiences, a field study was conducted in 12 homes with 15 individuals. The 9 female and 6 male participants ranged in age from 20 - 80 years old and were at a variety of life stages (e.g. studying in university, preparing for marriage, raising young children, empty nesters, preparing for retirement, legacy planning). Semi-structured interviews were held in the participants' homes and lasted 1 to 1.5 hours. Two of the interviews were conducted with married couples. The home visits comprised of a short interview through directed storytelling, followed by a touchstone tour around personal inventories (Csikszentmihalyi & Halton, 1981; Odom et al., 2009). To prepare the participants for the touchstone tour, we started with an interview to let participants describe their attitudes towards the future and share prior life experiences about goal achievement. Next, participants were prompted to show us some artifacts that they used during that earlier experience. Participants then continued to lead a home tour, identifying other physical and digital artifacts that embodied some aspect of their future.

6.2 Results

Figure 8: Laying out pictures collected from interviews for synthesis

109 objects were identified and documented from the home interviews, with an average of nine to ten objects from each participant (Figure 8). 52 physical and 57 digital artifacts were noted. Most of the artifacts were individually-owned, while participants who lived with other

family members tended to have artifacts, which were collectively owned (e.g. shared grocery list or common calendar on the fridge). Most individually-owned artifacts were also hidden from public view as participants considered them personal and private (e.g. secret folders of wedding-related ideas, futures wheel for ten year life planning). We also encountered numerous incidents where individuals came across artifacts in their possession that they had forgotten about or given up using.

6.3 Findings

Table 3 gives an overview of all the artifacts collected from the 12 homes. Each horizontal line represents a household,(although one household is depicted on two lines as the two household members were interviewed separately for scheduling reasons).. Combining our observations from the survey and the home interviews, we distilled the data into 5 identifiable types of futures thinking encountered in the domestic sphere: imagine, explore, appropriate, distill and plan. These categories differ in (1) formal qualities, (2) interaction, and (3) experiential qualities (Table 4).

Imagine | Explore | Appropriate | Distill | Plan

PARTICIPANT

F / 20s
part time work
lives with boyfriend

M & F / 20s
engaged, living together
male working
female in grad school

M / 30s
graduate student
planning for PhD

M & F / 20s
married / no children
husband working
wife in grad school

M / 30s
1 child
just moved to city

F / 30s
works as lecturer
started non-profit

F / 30s
finished grad sch
started a new career

M / 40s
single
remote working

F / 40s
married with 2 children
busy with work & home

F / 50s
married with 8 children
housewife / homeschool

M / 50s
married with 8 children
works from home

F / 60s
semi-retired
socially active

F / 80s
retired
host guests

Table 3: All artifacts collected from home interviews participants

1 IMAGINE

From our Mechanical Turk study, we identified artifacts that were not physical or digital, but rather intangible. An example includes, "I have groups of thought in my head of the kind of girl I want to marry." Some ideas from this stage tended to be randomly inspired, vague, or beyond individual immediate control, thus are not vivid enough for more concrete articulation. To some, these articulations can be conceived as pure fantasy or daydreaming, but to others, these statements demonstrate constructive tendencies for increasing creativity and releasing tension (Singer, 1975).

2 EXPLORE

In the 'Explore' stage, people were searching for ideas about what they might like or enjoy in the future. They did not have a very clear idea of the future they wanted and thus were shopping for ideas. Consequently, artifacts collected in this stage were primarily conceptual and abstract future representations. Most of the artifacts encountered in our study at this stage were digital, giving individuals a convenient way to gather, curate and keep track of their future thinking.

One of our participants started a Pinterest account with her boyfriend, where they collect images of land, cabins, dogs, etc. that they like. Secretly, she also kept a folder called 'dreams' on her computer desktop, with images of wedding dresses and wedding rings that she liked. Rich online information, attractive visuals and convenient bookmarking tools have motivated people to make big collections with reduced effort. Browsing and curating these collections becomes a reflexive activity that is largely driven by emotional motivations.

Responses such as, "I have forgotten that I kept that", were commonly heard during the interviews. From this, we can see that people may not be overly attached to these artifacts as they represent initial visceral responses to ideals they have. One participant reflected, "I learnt about what appeals to me as I pinned." In this sense, articulation of everyday futures becomes a way for people to explore themselves, by creating loose boundaries and visions of what ideal futures can look like. Even though far off in time and vague, many of the participants expressed that they derived pleasure and a sense of optimism when browsing through these collected artifacts.

3 APPROPRIATE

During the "Appropriate" stage, we observed that people began to think in a more grounded manner, by imagining themselves in their ideal futures, and shortlisting suitable ones for themselves. These futures may or may not be inspired from things they have explored earlier. For example, a participant who was preparing for her wedding, said, "At first, I just 'pinned' dresses I like. As I looked at online boutiques, I start to pin those that are within budget and will look good on me."

Artifacts (both physical and digital) encountered at this stage were often created entirely by the participants, as opposed to gather from external sources. People customized their inspirations of preferable futures, by crafting them into possible ones for themselves. For example, one participant created a unique wheel-like diagram, which consisted of different sized year rings with 12 slices, representing different categories in her life, e.g. family, career, etc. Each space was filled with 'directions' she might want to follow. "These are not goals, ... These are meant to be intentions or directions you might go, things that seem to be attractive, interesting, pulling things, they are not goals per say." The participant completed this exercise yearly because she enjoyed the reflective experience as she realigned her future projections with her current situation. She did not see this exercise as representing a commitment that was necessary to complete, rather it was a reflective activity.

While people explore their interest areas divergently, they also mentally negotiate with themselves. One participant started a notebook, where she and her boyfriend drew multiple blueprints for their dream garden. Reflection on action occurs as they shared their envisioned futures with each other. These artifacts became living documents of their futures, drawing them back repeatedly for additional iteration.. Another participant explained two pages at the back of her planner, "I call this my bucket list. They are not very specific but I know I need to do them. I did it around Christmas time last year. And in summer-August, I updated it by sticking this piece of paper on it."

It is interesting to note that in our study, objects in the 'Appropriate' stage were usually taken out towards the end of the interview. They were often hidden away from view as well, e.g. behind the shelf or in a box next to the couch. Participants seemed to view these artifacts as personal and private, as they spoke vividly about their identity and personality. Some of them were slightly abashed about their dreams, such as owning a house with fresh daffodils in the porch, or having a second honeymoon..

4   DISTILL

In the "Distill" stage, we encountered people becoming selective about the futures they really needed, in contrast with what they wanted.. Many of the intentions observed in the 'Imagine', 'Explore' and 'Appropriate' stages did not make it to the Distill phase.

The majority of the artifacts we recorded were editable digital text documents . One participant showed us an online shopping cart filled with items, which she revisited occasionally to evaluate if she still needed them. Another participant who was a mother explained a desktop file named 'Rachel's to dos', which she diligently filled up through the year, with possible Christmas gift options for her children. Many lists were also concise and specific, created with pragmatic consideration of real-world constraints.

5 PLAN

In the 'Plan' stage, are participants were clearly en route to executing their futures. Most of the future goals embodied in the artifacts encountered were for near-term planning, thus usually concrete and actionable. Some people adopted lightweight strategies, like writing reminders on their hands, while others preferred structured strategies, such as planners with complex categorization. Writing plans and lists was used by several of the participants to offload thoughts in order to safely forget.

Several participants demonstrated how templates were useful in giving loose boundaries for decision-making and also invited experimentation. One parent described her monthly meal planner, "I fill this up, and see the overview for the month. When it is getting boring, I will fill up some slots with new recipes I would like to try." Besides wanting to see the big picture of their plans, people looked for artifacts, like calendars and templates, which afforded customization. Their desire to optimize their tools and workflow revealed their need for a sense of knowing and control in their daily lives.

Types of everyday futures	Examples of artifacts	Formal Qualities	Interaction	Values / Experiential qualities
IMAGINE What am I thinking about?	Thoughts, ideas, vision in the head of dream job, vacation or partner	Random Intangible	Inspired Imagined	Freedom Self-indulgence Hopefulness Imagination
EXPLORE What do I like?	Pinterest boards of future homes, bookmarked links of universities, binder of recipes, inspirational quotes	Conceptual Abstract General	Browsed Curated	Optimism Pleasure Self-exploration Stimulation
APPROPRIATE What suits me?	Sketches of future garden, diagrams of career goals, whiteboard writings of life philosophy	Intentionally vague	Created Appropriated	Reflection on action Flexibility Sense of purpose Grounded hopefulness
DISTILL What do I need?	Honey-do-lists, un-checked out shopping carts, someday-maybe lists of home projects.	Vivid Concise Specific	Negotiated Eliminated Selected	Rationality Pragmatism Resolution Judgment
PLAN What do I do?	Synchronized calendar across devices, shopping lists, packing lists, post-its of to dos, writings on hand for reminders	Concrete Actionable Structured	Planned Tracked Optimized Habitualized	Optimization Efficiency Completion Accomplishment

Table 4: Characteristics of five types of everyday futures

OVERALL

Imagine

Explore
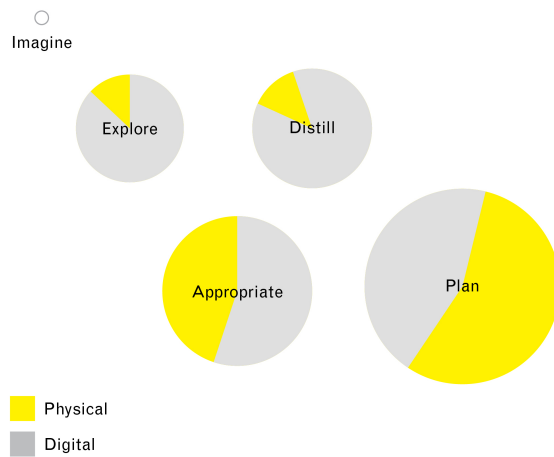
Distill

Appropriate

Plan

■ Physical
■ Digital

Figure 9: Number of artifact examples from each type of everyday futures

From these home interviews, we collected rich stories about people's future thinking and planning practices through their artifacts. The artifacts gave people a handle on their unseen future. Each person employed a different combination of artifacts to manage a variety of types of everyday futures.

We found the largest number and variety of artifacts from the 'Plan' category. The plethora of tools in the market gave people plenty of options to cope with day to day planning. 'Explore' had the least number of unique artifact examples. Pinterest was the most commonly mentioned exploration tool that people use. The lack of similar tools and the popularity of it confirms our earlier point that there is a need to address other needs of everyday futures, other than efficiency and accomplishment. When people use Pinterest, they feel inspired, optimistic and experience great pleasure. In 'Appropriate', we found people using Pinterest in more reflective ways as compared to 'Explore'. They took time to contextualize preferable futures on Pinterest into possible ones for themselves. We were also impressed by the examples of physical artifacts created from scratch by our participants (e.g. sketches and futures wheel). The time and effort they spent on appropriating futures without dedicated tools showed that people are willing to dwell and immerse themselves in the activity. They were not looking for efficient, quick fixes or shortcuts.

Unfulfilled futures were prevalent across all home interviews participants. Pieces of these unfulfilled futures played an inspirational role in informing the decisions made along the way. Participants reflected that this exploration of alternate futures becomes also an exploration of self. Dreaming and planning about the future offers more than a pathway to achieving goals. There are other experiential qualities that accompany it, which make the means as critical as the end.

7 Introduction to 4 individual case studies

Findings from the survey and home interviews have revealed that future-oriented practices in the domestic sphere are not entirely goal-driven. There are opportunities to introduce new tools and methods that are more experience-focused. In our experiment phase, we selected two methods that are typically used in the professional realm of Futures Studies and Design, to introduce to our participants. We were curious to see if the Manoa method from Futures Studies research and a Design Fiction approach from speculative design practice could fill in the experience gap in everyday futures.

We recruited four out of the fifteen individuals who took part in our home interviews to participate. They varied in life stage (e.g. applying for graduate school, finishing up graduate school, began a new job, approaching retirement), personality (e.g. idealist, realist), planning styles and strategies (e.g. casual and lightweight, rigorous and detailed). They were also available and open to testing out both methods over a period of two months.

The following table (Table 5) summarizes the four participants and gives a preview of their responses from the two methods that they encountered in the experiment phase.

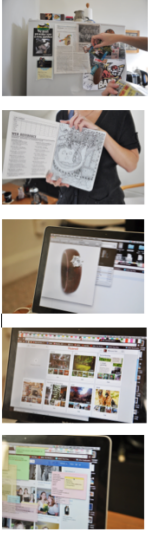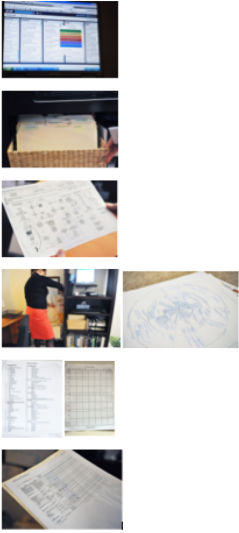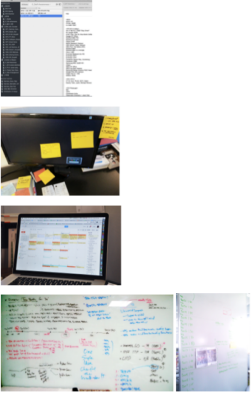| Participant	A	B	C	D
Demographics	- 60s - Approaching retirement - Managing business with husband - Stays with husband and daughter	- 20s - Living with a partner - Applying for graduate school - Working in REI and attending part-time classes in university	- Mid 30s - Living alone - Just completed graduate school - Just started a new job	- Early 30s - Completing graduate school - Deciding between doing a PhD or apply for a job
Interest	- Community building - Gardening and local food - Cooking and eating healthy - Reading self-help books - Involved in City of Asylum to support cross-cultural exchange between writers - Travelling - Yoga - Learning Spanish	- Outdoors - Farming - Cooking - Drawing	- Yoga - Eating & living healthy	- Design theory - HCI - Service Design - Music - Philosophical writings - Reading
Planning Habits	- Dependent on iPad for calendar and notes - Lightweight strategies - Claims to be a procrastinator - Prefers more stress-free ways of planning	- Avid Pinterest user - Does a lot of planning/dreaming with her partner - More artifacts from far future planning than near future planning - Prefers light-weight/ non-rigorous planning strategies (e.g. Pinterest, stickies)	- Meticulous - Organized - Detailed - Rigorous - Willing to put in effort to get organized (e.g. making template)	- Planning as a reflection exercise - Include personal values in planning - Social circle informs his future planning
Current Tools	- iPad 	- Sketchbooks - Pinterest - Digital Stickies - Notes on fridge - Files and folders	- Futures wheel drawing - Lifestyle tracking template - Trello - Meal planner - Packing template - Projects folders - Getting work done workflow - Bill templates	- Evernote - Post-it notes - Inspirational quotes - Whiteboards

Future Goals (from Manoa Approach)	- Cook healthy and 'succulent' food - Home improvements, like insulating the sunroom, rethinking storage - Better workout through yoga and tennis - Get US citizenship - Read about Buddha path and meditation	- More camping and backpacking - Do more photography - Buy land for homesteading - Become a gear tester for REI	- Buy a house in Pittsburgh - More certainty about career – feel more in charge of destiny - Abundantly healthy body - Confident about cardio ability - Reduce energy spent on work - Purchase a smart phone	- Form a happy family - Produce work with a lasting impact - Be a good teacher
Design Fiction approach	Urban Cultivators An experience prototype of rural farming from an urban setting	MicroFutures A photographic toolkit to construct scenes of the future	Building futures A toolkit to create diagrams of their imagined future data.	Postcards from the future Stamped postcards with future-related questions to be handed out to people

Table 5: Overview of four individuals involved in experimental phase

8 Experiment phase —
Manoa Approach
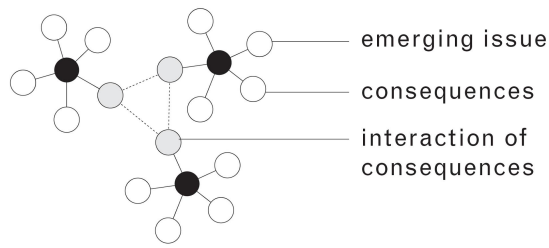
Figure 10: Diagram explaining the Manoa method from Futures Studies

8.1 Method

First, the future studies method, called Manoa scenario building is introduced to the 4 participants. When applied in Futures studies, the Manoa approach starts by identifying three to five emerging issues of change (Figure 10). Next, experts brainstorm and map out potential impacts stemming from those issues. These impacts are then overlapped to see how they work together. Supported by existing data, new and sometimes surprising scenarios are derived from the cross-impacts. For an everyday application, we adapted the Manoa approach by asking participants to map out the consequences of a significant event that they had experienced before, and then on another map, they mapped out the imagined consequences of a future goal that they have. Over 3 weeks, participants built on the initial maps they created or started new ones. Personalized diaries with photos taken from their earlier home interviews were provided for them to capture any thoughts, conversations or actions that extended from this exercise.

Figure 11: Personalised diaries for each participant

8.2 Results

Participant A
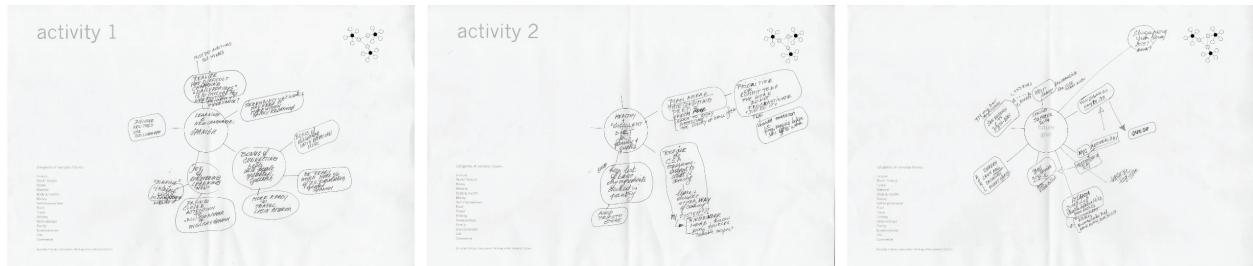
Figure 12: Manoa exercise with Participant A
Left to right: Past experience – Learning a new language, Spanish, Future goal – Cooking healthy and 'succulent' meal for family and friends, Future goal – Spring Summer 2014 holiday planning

Participant A reflected upon her current experience of learning Spanish and wrote down the joy and challenges that resulted. While plotting out imagined consequences from her future goal of cooking healthier meals, it was very natural for her to formulate barriers (e.g. hassle of looking for recipes each meal) and thus, actionable strategies concurrently. She also creatively used the mapping technique to plan her upcoming summer holidays, which involved coordinating events, family and friends across the country (Figure 12).

Figure 13: Recipe folders - picture taken by participant at a friend's place

The activity inspired her to download new mobile applications to cope with learning Spanish and meal planning. During a dinner, she took a picture of her friend's recipe folders and was motivated to emulate her method of organization (Figure 13).

Future goal:
-    Cook healthy and 'succulent' food for family and friends
-    Home improvements, like insulating the sunroom, rethinking storage
-    Better workout through yoga and tennis
-    Get US citizenship
-    Read about Buddha path and meditation

Participant B
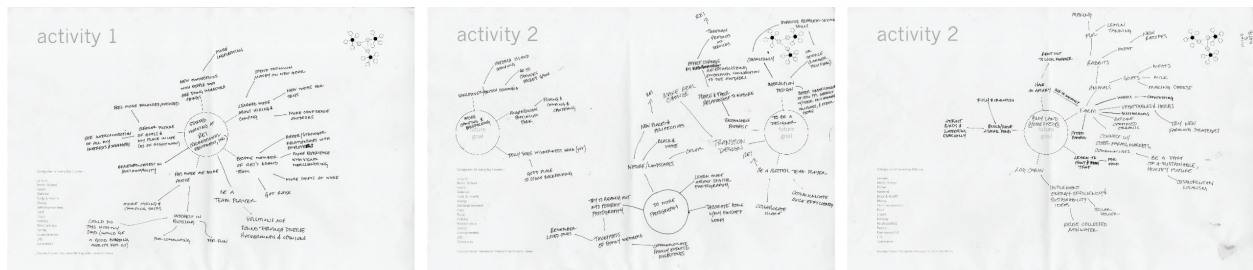
Figure 14: Manoa exercise with Participant B
Left to right: Current experience – working in a sports company, Future goal – camping & backpacking, becoming a designer, do more photography, Future goal – buying land for homesteading

Participant B reflected on how her current working experience in a sports company has led her to learn more about herself and her interest in the outdoors. Consequently, she started to imagine herself achieving other goals like doing more camping and backpacking, becoming a designer, doing more photography and becoming a gear tester. She also made a map with her boyfriend, illustrating their common goal of buying land for homesteading. To their pleasant surprise, they found that their skill sets though very different, could fit together to amplify each other's strengths (Figure 14).

After work one day, she revisited the map to add how her current work has made her into a better team player. Inspired to be more assertive regarding future goals, she decided to move beyond her comfort zone and met with the company's CEO to actively network. She also fulfilled her interest in cycling since then.

Future goal:
- More camping and backpacking
- Do more photography
- Buy land for homesteading
- Become a gear tester for REI

Participant C
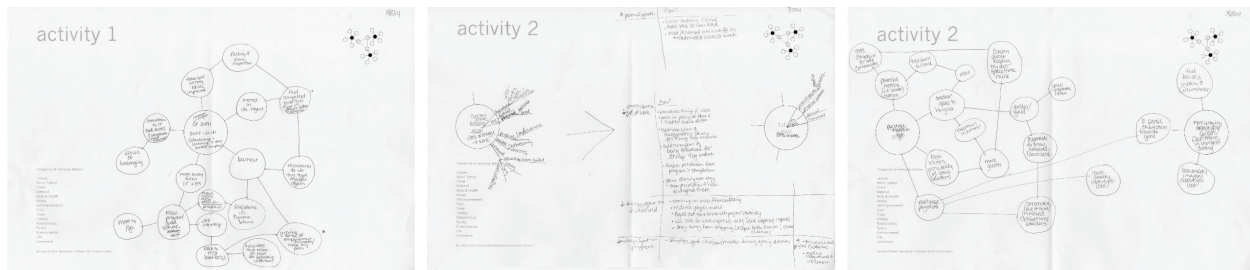
Figure 15: Manoa exercise with Participant C
Left to right: Past experience – An experience with a big project, Future goal – Comparison of current and ideal energy spent on work, Future goal – Connecting 'purchase of home' with 'career certainty'

To start, Participant C recounted a major project that she had embarked on. Despite having negative experiences, she also presented positive consequences, like sense of empowerment, as well. Using the same mapping approach, she compared and evaluated two diets that she has been trying out. Employing similar comparison techniques, she assessed how she can reduce the amount of energy she spends on work currently to achieve better personal wellbeing. She also drew a few map connections between having more career certainty to purchasing a house (Figure 15).
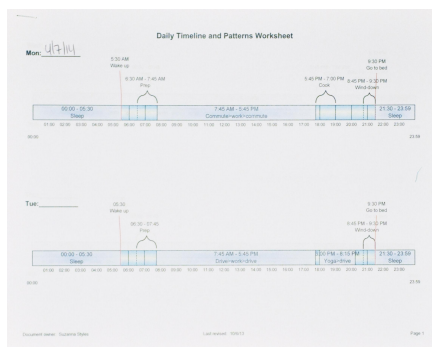
Figure 16: Self-made templates for tracking her lifestyle to identify patterns in health symptoms

While doing this exercise, she pulled out previous similar exercises (Figure 16) she had done, and decided to continue that practice. Her diary entries indicated her desire to do future reflections quarterly instead of yearly. She also noticed a common theme of 'control over career' in all her maps.

Future goal:
- Buy a house in Pittsburgh
- More certainty about career – feel more in charge of destiny
- Abundantly healthy body
- Confident about cardio ability
- Reduce energy spent on work
- Purchase a smart phone

Participant D
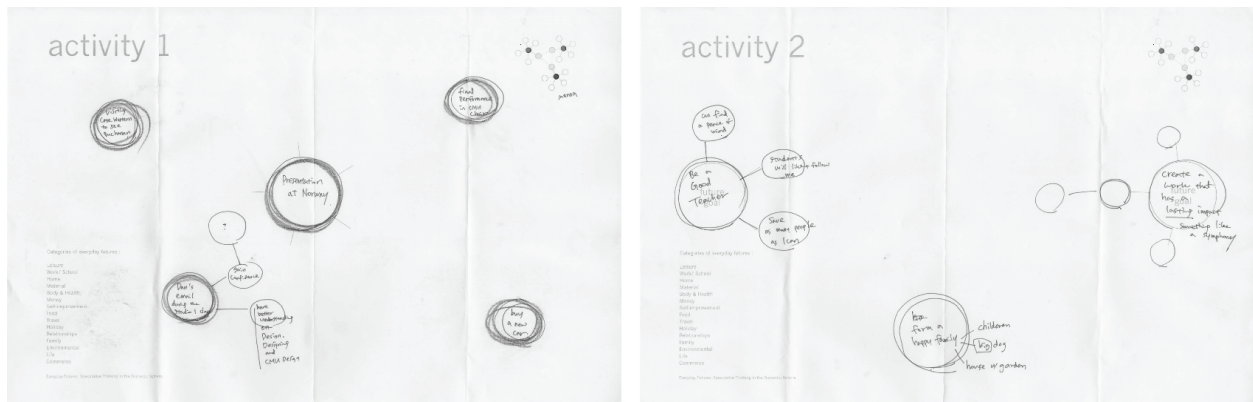
Figure 17: Manoa exercise with Participant D
Manoa approach (past experiences) – 5 past experiences listed
Manoa approach (future goals) – 3 future goals identified

When mapping out past experiences, Participant D easily expressed five recent events that he found significant, including a trip, two presentations, a purchase, and an email conversation. Without expanding on the consequences of past experiences, he moved on to map his future goals, namely being a good teacher, forming a happy family, and creating lasting, impactful work. Further expansion on these future goals is also lacking (Figure 17).
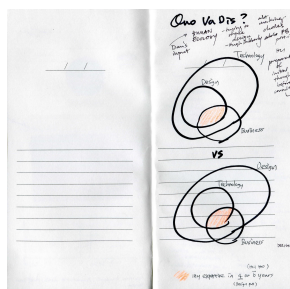
Figure 18: Recorded in diary – A Facebook post that participant used
to gather friends' responses regarding future career direction

However, this participant found the diary studies more compelling. He made new notes in Evernote, posted two diagrams about his career focus on Facebook (Figure 18)to solicit responses, and talked to a list of people with expertise and experience regarding his future direction. His last entry reflects an emotional response towards his undecided future, along with some 'wants' and 'do-not-wants'.

Future goal:
- Form a happy family
- Produce work with a lasting impact
- Be a good teacher

8.3 Findings

Consequences vs Options
In this first activity, it was natural for all participants to recall their past experiences and map out the resulting positive and negative consequences in their lives. During the second activity, the participants were supposed to imagine consequences of their future goals, but it was common for them to explore options instead. For example, Participant B has the goal of buying land to start homesteading. The branches on the map reflect things that she would like to grow and rear on the land instead of the potential benefits or consequences of homesteading. Having little or no experience with the intended future goal may contribute to the challenge of imagining consequences. The future goals of participants may still be at an infancy stage, and thus lack the needed clarity to predict consequences.

The slight derailed use of the method helped us discover how it can be adequately used for both reflective and planning purposes.

Bringing clarity and interconnectedness
By writing and expanding future goals on a map, participants gained greater clarity of their thoughts. These thoughts moved from being intangible to tangible and fragmented to collected. Several of them appreciate the freedom to express thoughts on big, blank pieces of paper. Besides laying the goals and consequences out, participants also drew lines to represent interconnectedness between them. "Before this, I think of my plans linearly. I do this, then that. Now I can see how my plans link together and in fact it becomes simplified," said one participant.

Even though mind maps are not entirely new and we are not using the Manoa approach as rigorously as professional futurists, our participants have found it deeply helpful in visualizing their future goals. This method works well as it provides some structure for thinking and also great flexibility to accommodate different situations of use. We can see this method fitting well into 3 out of the 5 types of everyday futures. In 'Appropriate', 'Distill', and 'Plan', people have general future directions but are still wondering which goals will be more suitable for themselves. Mapping options and consequences through the Manoa method can help them survey the landscape and also see how goals complement or oppose each other, allowing choices to begin to narrow.

While there are examples of how the Manoa method has led to further action taken by the participants, there seems to be little evidence to prove that it has led to inspiration of new goals. In our home interviews study, we found two types of everyday futures, i.e 'Imagine' and 'Explore', where people immersed themselves in the pleasure of imagination and self-exploration. If the Manoa method tends to move people towards being more action-oriented, we wonder if design fiction methods can play an inspirational and generative role to support the other two types of everyday futures.

9 Experiment phase —
   Design fiction approach

Based on our synthesized understanding of each participant's future planning practices and future goals reflected through the Manoa method, we customized a unique design fiction piece for each of them. The design fictions were introduced to the participants after they completed their 3-week experimentation with the Manoa method. We wanted to create very open-ended design fictions that are intimately relevant and useful to each individual, to invite their participation in further contextualizing the designs for themselves.
The following case studies elaborate detailed accounts of each design fiction. Meanwhile, they continued to record their further accounts in the diaries. When the participant was ready, after about 5 weeks, they presented new artifacts that they made and shared their design fiction experience. The participants described their process of interaction, afterthoughts by comparing with current practices, and the activities or artifacts that extended from the activity. All diary entries, created artifacts and notes from the final interviews were analyzed for further findings. To conclude, each participant was compensated with a $70 gift card.

The following section will explore the design fiction experiment through 4 individual case studies. We will describe in detail their personalized design fiction piece, the results and findings from their interactions with their own design fiction.

Case Study A

9.1A Methods

Participant A is in her 60s, semi-retiring while managing a business with her husband. Her current stage of life gives her the capacity to be very active among her community. She serves on multiple boards of different non-profit organizations, providing them consulting services. Her future goals include mastering Spanish, travelling, gardening and cooking healthy food for her family and friends.

Figure 19: Design fiction experiment with Participant A
Left to right: Indoor greenhouse with herb plant and mobile phone, Items placed in the green house, Digital newsletter sent to participant via email.

The design fiction 'toolkit' for this participant includes (Figure 19):
-    A small indoor greenhouse with a herb plant and mobile phone
-    Items placed in the greenhouse every other day (e.g. pomelo fruit, avocado, photo of family and farm, Urban Cultivators newsletter, etc)

This design fiction draws inspiration from experience prototyping (Buchenau & Suri, 2000). The participant was informed that she was specially chosen to be an urban cultivator. She owns a plot of farmland in Elqui Valley, Chile and the farmer taking care of her farm is called José (enacted by the researcher). Through the mobile phone, José gives her farm updates in Spanish and asks her for further instructions when the harvest is ready. Urban Cultivators, as a fictional organization, also sends her online newsletters in English, informing her about ideas carried out by fellow urban farmers who are in the same program (e.g. a picnic using superfoods grown by an urban cultivator from Denver and farmer from Peru). The greenhouse is also a portal for her to receive physical objects from José or other urban farmers. We recruited her daughter to place the items into the greenhouse in secret. Her role was to participate in the narrative by collaborating with José. Using her produce in Chile, she aims to extend her reach to serve his family and community.

9.2A Results

Figure 20: Results for Design fiction experiment generated by Participant A
Left to right: Greenhouse set in her home, Herb plant being transferred into her garden, New objects appearing in the greenhouse, Text message conversation in Spanish between participant and the imaginary farmer, Online research (more than 15 hyperlinks) compiled by participant, Photos of springtime sent from participant to farmer, Relevant articles read by participant sent to farmer

Upon receiving the design fiction, she took pictures of the box on her dining table and transferred the herbs to bigger pots and placed them outdoors (Figure 20). The participant was subsequently introduced to the farm through pictures of the farm area, the farmer's family photo and also sample fruits from the farm. She was pleasantly surprised to receive the photos and included them in her own scrapbook. Through the design fiction experiment, the participant was continually asked questions about techniques of farming fruits, especially in the arid Chilean region. She also proactively shared details about her own family and showed pictures of what spring gardening is like in her own neighborhood.

When challenged to devise next steps for her crops that are ready for harvest, she took time to do online research regarding existing community farms. She returned with more than 15 hyperlinks, containing examples of food systems and services from overseas, Pittsburgh, and her own experiences. She describes this process as "an exploration on how Jose's family can better their life in the broad sense of eating well and eating healthy." She finds the need to familiarize herself with the situation in Elqui Valley, so that her suggestions can effectively 'blend in their customs and their eco-system to yield better results.' Besides communicating with Jose, her personal farmer, the participant was also eager to contribute to the 'Urban Cultivators' newsletter with events from her own hometown.

Communication with Jose started off using phone messaging, but quickly was converted to emails as it was more convenient for the participant. Half of the participant's responses were in Spanish and the others were in English.

9.3A Findings

Comparison with current practices
The participant has been hesitant about starting farming in her backyard because of the expected commitment, thus there is no equivalent practices to compare to. This design fiction thus becomes an experience prototype (Buchenau & Suri, J. F, 2000) applied in the domestic sphere, for her to gain understanding about what alternate types of farming can entail, e.g. impact on community, environmental challenges. Designed from a more 'eccentric' angle, it becomes hard to form a direct comparison with the participant's current practices, if there is any.

However, we see her efforts in integrating the design fiction into her domestic sphere. Transferring the herbs into her garden pots and pasting the photos in her scrapbook showed concrete gestures of her accepting the imaginary narrative behind design fiction readily. She also made it a point to keep the indoor greenhouse in the prominent place in the house, so that she would be reminded of the project. The physical embodiment of the design fiction has facilitated this initial engagement, while the subsequent interaction through digital means has sustained the interest.

Engaging the future through discovery
The design fiction, being customized for the participant at an individual level, allowed us to engage her interest precisely at more than one level. Leveraging on her interest in community, food, Spanish as a language, and adjusting to her technological preferences, the design fiction was able to solicit her invested participation for the entire period of the study. The interactive experience was unlike one-off encounters with design fictions in exhibits, but was a sustained, two-way communication. In addition, the conversation with the imaginary farmer was enriched through the use of physical artifacts, images, and text that are delivered to the participant every other day.

Besides supplying the participant with information, the design fiction also encompasses a mission of serving the community through her harvest. It also poses challenges, such as lack of water supply or harvesting too much produce, to invite the participant in problem solving. The participant enjoyed that interaction as it kept her motivated to participate on an intellectual level as well. "You gave enough space for the person who is in agreement to go along with it, who has to use a little of bit of their open mind and creativity."

The non-static nature of this design fiction expands the possibility of how design fiction can engage people's everyday futures as a discovery process instead of as a single encounter. What if imaginary futures can run in parallel with real life for a more experiential depiction? How can futures be prototyped to offer new insights for decision-making?

Impact

Being an avid reader, the participant actively finds opportunities to apply new found knowledge during her services in her community. Helping Jose carry out her imaginary farming business gave her an opportunity to piece together past experiences and readings, which was originally fragmented in her mind. Through the study, she has also become more active in scanning her daily life for related information as well. She began wondering about 'farm to table' practices and how she can practice more of that herself.

The herbs given to her at the beginning of the design fiction experiment have kickstarted her farming goal in a small way. However, besides practicing farming on her own, it can also be as valuable if she uses her knowledge from this hands-on design fiction in her local community spheres. We also see potential in expanding such 'experience prototype-design fiction' into other arenas of the domestic sphere, to allow everyday people to expand their options before full commitment.

Case Study B

9.1B Methods

Participant B is in her 20s, working part time in an outdoor gear company, while applying for graduate school. She lives with her boyfriend and they share similar interests in gardening and outdoor camping. Much of their future planning happens on Pinterest where they share boards and pin ideas of their future home, projects, etc. Her future goals include doing more camping and outdoor activities, becoming a designer, and picking up photography once again.

Figure 21: Design fiction experiment with Participant B
Microfutures toolkit with materials and instructions

Her toolkit includes (Figure 21):
-    mini figurines
     (a set of colored figurines in camping postures and a set of generic white figures)
-    box with white paper as backdrop
-    loose materials (felt, potpourri pieces, wood shavings, pom-poms, etc)
-    tools (scissors, glue, tape, play-doh)
-    8 idea cards with environmental future ideas (e.g. Foragers by Dunne & Raby, Oogst 1000 Wonderland by Tjep, Plantagon by Sweco, etc)[4]

The participant was asked to imagine herself as a voyager from the future. Using the materials in the toolkit, she will construct scenes from the future and take pictures of herself represented by the mini figurines in those future scenarios. She then writes a short narrative describing her experiences from the future.

This design fiction borrows ideas from 3D prototyping, storytelling and encourages the participant to think of 'What if' scenarios.

---

[4] http://www.dunneandraby.co.uk/content/projects/510/0
[4] http://www.tjep.com/studio/works/architecture/oogst-1000
[4] http://www.sweco.se/sv/sweden/tjanster/Arkitektur-och-planering/Visualisering/Plantagon/

9.2B Results

The participant used the toolkit to imagine how she might carry out two of her interests in the future. First, she created a scene of underwater camping, complete with water resistant tents, underwater parklands, scuba diving hikes, and submarine shuttles. The idea was inspired by two co-workers who have separate interests, i.e. hiking and scuba-diving, and how she can combine both of them together. Besides using materials in the kit to represent the colorful underwater landscape, she also included her own materials, like plastic and shells to create submarines and structures. In the next scene, the participant created her dream, energy-efficient cabin with cloud irrigated farmland. She started by looking at the shapes of the material in the toolkit and tried variations of how each might become an effective rainwater catching device. Her past experience in farming and the idea cards led her to think about the possibility of generating the right size of cloud, for the right amount water, to water a specific part of the farm. In addition to adding and pasting things together, she also sketched parts of the scene to add further details (e.g. the facade of the cabin).
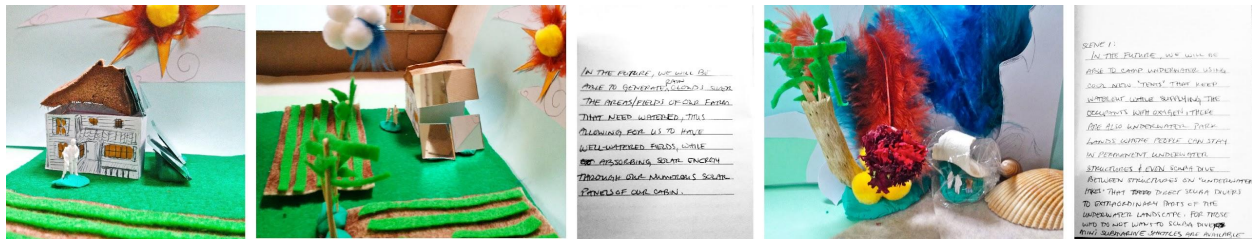
Figure 22: Dioramas generated by Participant B
Left to right: Scene 1 – Future farming and cabin, Scene 2 –Underwater camping

Scene 1 - Underwater camping (Figure 22)
"In the future, we will be able to camp underwater using cool new 'tents' that keep water out while supplying the occupants with oxygen. There are also underwater parklands where people can stay in permanent underwater structures and even scuba dive between structures on 'underwater hikes' that direct scuba divers to extraordinary parts of the underwater landscape. For those who do not want to scuba dive, mini submarine shuttles are available."

Scene 2 - Future farming and cabin (Figure 22)
"In the future, we will be able to generate rain clouds over the areas/ fields of our farm that need water, thus allowing for us to have well-watered fields, while absorbing solar energy through our numerous solar panels of our cabin."

9.3B Findings

Comparison with current practices
It was surprising to see participants directing and creating full dioramas of the future, instead of smaller vignettes, featuring a single snapshot of a specific future scene. When we asked her to compare this exercise to her current Pinterest habits, she revealed a possible reason to why she constructed dioramas.

"(In Pinterest) I only like the shelf at the back of the picture, that's why I pinned that picture. But in my head, I piece all the things that I like together and see my dream home... This activity is a little more concrete, I can do big scale ideas, think bigger, less about the shelves but more about what cool, innovative things can we do for the farm as a whole, as opposed to splitting up Pinterest boards into cabin, kitchen, yard, farm, and it's very segmented. It objectifies my dreams. It's useful but I like being able to put it altogether, and see what the big picture of the future can be."

The participant reflected that Pinterest tends to be more single object-oriented, while creating dioramas gave her a good opportunity to move away from smaller, fragmented pieces of details to construct her dream from a big picture perspective. The objects in the toolkit being abstract, have also urged her to actively exercise her own imagination to 'create' futures, instead of 'collect' futures on Pinterest. While choosing and manipulating the materials, there is constant reflection in action, as she internally evaluates based on her personal aspiration, preferences, knowledge, past experiences, technical considerations and remote inspiration (e.g. conversation with friends, idea cards from toolkit).

Time and effort
The participants usually loves to share future dreaming experience with her boyfriend, as she did for the Manoa maps. However, she only showed him pictures of what she made, instead of involving him in the construction this time round. The time and effort needed to make the dioramas are the main contributing reasons.

Impact
The design fiction exercise has grown her interest in homesteading and she has since continued to grow her Pinterest boards. As this project was carried out consecutively, with the Manoa method preceding the design fiction, she evaluated that both experiences together have inspired her to be more assertive about going after what she wants in the future. More immediately, she has bought a bicycle to kickstart her goal of going outdoors more. The design fiction on future farming has compelled her to consider choosing to live in the outskirts of a city when she starts full time work in 3 years' time.

Case Study C

9.1C Methods

Participant C is in her 30s and has completed graduate school a year ago. She started a new job and lives alone in an apartment. Her future goals include buying a house, getting more confident of her fitness and health and attaining a better work-life balance.

Figure 23: Design fiction experiment with Participant C
Building futures toolkit with booklet and materials

The toolkit includes (Figure 23):
- A booklet with
    - time-related data point titles like, months and days spent in the house, hours spent in each room,
    - spaced-related data point titles like, house layout and neighborhood location,
    - people-related data point titles like, surrounding community.
- Colored paper with varying sizes of rectangles and circles.
- Scissors and glue
- Housing Futures 2024 – a futures report on housing by Cabe and Riba
- 2014 Pittsburgh Today & Tomorrow - a regional annual report with the facts and future about their region

This design is inspired by Nicolas Felton, who generates annual reports of his previous year, in the form of infographics. While Felton understands more about himself and his routines through documenting daily data, we wonder if a person can do the same by forecasting their future data instead of present data. Given a blank booklet designed with only data point titles, it is up to the participant to use the medium and materials to create diagrams of their imagined future data. We are also curious to see how futures and regional reports, which are related to housing and published publicly, will inform the participant's process and future plans.

The nature of this design fiction bears similarity with paper prototyping procedures that designers use to test initial ideas quickly.

9.2C Results

Figure 24: Visualizations generated by Participant C
Left to right: Layout of future house (1), Time spent in every room, Time spent a year in the house, Location and community around the house, Schedule of a week, Layout of future house (2)

The participant completed all the data point titles with her own infographics (Figure 24). She was excited about the playful, crafty medium initially, but in the end found writing and drawing more efficient. Throughout the exercise, she considered back and forth her present and ideal state, thinking about what she is unsatisfied with now and what she would like to change. First, she came up with a home layout that she described as, 'traditional and conventional'. Inspired by an experience in a relative's house, she originally wanted to layout a double-storey house, but in the end, found out that the single storey layout was sufficient for her. Besides dreaming about having outdoor and gardening space, she conceived an idea whereby half of her bedroom is sectioned into yoga, closet and bath area. Feeling the need to think out of the box, she created another layout which she modelled after Spanish architecture, by placing the green space in the middle and 'wrapping' the rooms around it in a U-shape.

Next, she used color-coded circles to visualize her daily hours spent in each room of both her current and future home (Figure 24). The circles in her current home are clearly separate, while according to her future home layout, the circles can overlap with one another, indicating that she would like her rooms to feel like a blended space. She carried on visualizing her ideal week of activities. She found it similar to an exercise she did several months ago, where she track her activities and health symptoms everyday to investigate the cause of unwellness (Figure 16).Flipping the idea of tracking, she started making her 'week' infographic with what she ideally want- 8 hours of daily sleep. After filling in her week with other activities, she calculated that it left only 39 hours for work, which is unrealistic.

Being very satisfied with the location of her apartment now, her infographic for ideal 'Location' and 'Community' reflects high similarity to her current state.

The participant found the Housing futures report confusing and did not learn much from reading it. The ideas in the report, such as 'the housing of the future will be adaptable and flexible', were too abstract and she could not relate it to her own future house. However, the report reminded her about some considerations, like energy saving and living with aged parents, and she reflected those in her second home layout.

9.3C Findings

Comparison with current practices
Life planning is not entirely new for the participants for she practices a yearly ritual of future goal setting. Starting from a year out, she thinks about what is possible and desirable for herself, and begins to write down 'intentions' until ten years out. The design fiction requires her to reverse her thought process by leaping into the future directly to think about the ideal first. Engaged by the novelty of the idea and materials, she jumped right into the exercise. However, the booklet revealed the participant's repeated attempts to use the colored paper medium, but giving up midway to use pen and markers. It was initially fun, but she found it a lot more efficient to create the diagrams by drawing. Even while drawing, she was tempted to revert to using a spreadsheet, which she is proficient in. In the debrief, she commented that it is still important for the toolkit to look and feel engaging from the start. If the design fiction was designed as a spreadsheet, she might not have been that interested as it will lack novelty. She also found that the crafty and imprecise nature of the materials makes the activity 'forgiving', 'liberating' and 'inspirational'.

Raising questions
As she did backcasting from her ideal state, she found that the infographics, being a simplified representation of her life, was graspable and useful in raising questions for herself. For example, after allocating 1.5 hour each day for food preparation, she wonders if that is the best way to spend her time and if she would really like to do that every single day. "It makes think about, "what I am willing to give up?... It brings up questions for me to think about what my values are, think about honestly how do I want to spend my time."

In the future, the participant would like some time set apart for personal growth and education and that resulted in a need to reduce working hours. Upon further reflection, she noticed that she enjoys her work because she is developing professionally and is given creative freedom. As things in her life can double up in this manner, she feels that the diagrammatic representations are too absolute, lack in the flexibility to represent the actual complexity and haphazardness of life.

Impact

This design fiction has encouraged the participant to leave constraints behind and create vignettes of imaginary futures in a light-hearted manner. In the process of making, it has challenged the participants to question her present and intended future. Why I am doing what I am doing? To have the future I want, what do I have to sacrifice? This activity was carried out at a good time where the participant is in a very early stage of planning and is still uncertain if she really wants to buy a house. Therefore, it provided her with a whimsical, stress-free way to engaging hypothetical futures. A longitudinal study will be needed to see how the impact of this study manifests in her future decision-making.

Case Study D

9.1D Methods

Participant D is in his early 30s, and is completing graduate school. He is at a crossroads, deciding between further studies or applying for a job. He wants to create work that has a lasting impact and also settle down in the next few years. He also has the desire to teach as a profession.
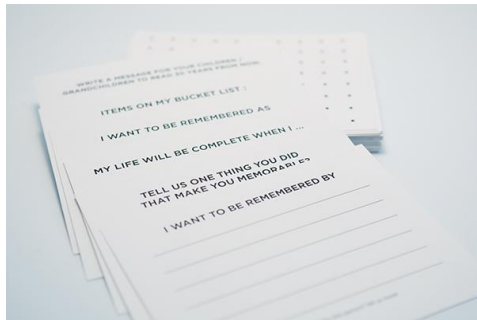

Figure 25: Design fiction experiment with Participant D
Empty postcards of the future

Borrowing research techniques from cultural probes (Gaver et al., 1996), the participant is given 40 stamped postcards with his address written on one side (Figure 25). Each postcard is printed with one open-ended, future-related question, such as 'I want to be remembered by…', 'My life will be complete when…' or 'A message to my grandchildren…' Some postcards are left empty for the participant to fill in his own desired questions. The participant then hands out the postcards to family, friends or even strangers to be filled up and sent to his mailbox. Personal reflection is recorded in the diary upon receiving and reading these postcards.
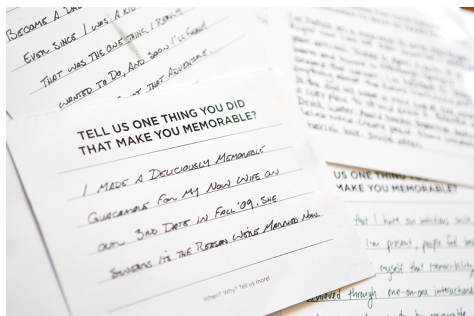
9.2D Results

Figure 26: Postcards received by Participant D

By the end of our experiment period, the participant collected 5 postcards (Figure 26). Cards received were anonymous. Most of the cards mentioned family members and depicted events that accrue meaning from smaller daily experiences (e.g. making meals for wife, being memorable through one-to-one interactions). One exception includes a card with a bucket list of 'once-in-a-lifetime' experiences. The participant was not particularly motivated by the generative part of this study and did not find time to formulate his own questions.

9.3D Findings

Comparison with current practices
The participant regarded the postcards as a tool to mediate conversations between people. Before our experiment, it had already been part of the participant's practice to be proactive in building relationships with people whom he respects through coffee and lunch meetings. Being very comfortable with asking future-related questions on a personal basis, he therefore highly values the human experience that is only achieved through face-to-face interactions. He feels that the postcards as a tool support the interaction but remove the interpersonal connection to a large extent.

Anonymity
The participant felt that the anonymity of the postcards has limited the potential impact of this design fiction. He felt that the impact lies in two factors, (1) how respectable the person is to him, (2) and if the response was written directly for him. Both factors require some sort of understanding to be established between receiver and giver, instead of pure anonymity. He equated the anonymous postcards to public tweets from strangers on Twitter or Facebook, which he tends to only glance quickly. The participant pointed out that his strong sense of self-awareness and identity might be the reason that he directs his attention to a more specific set of audience.

As this design fiction was only carried out on one person, we wonder if the space for imagination created by anonymity will appeal to another person who has just embarked on a malleable stage of life for self definition. Prompted from this experiment, we also began to question what happens if the medium of design fiction can transit from being physically embodied to conceptually manifested, e.g. a mental framework. How can similar thought provocation continue to manifest when the person departs from the artifact?

Impact
The participant attributed some relationship between the design fiction activity with his recent addition of an email footer, which reads, "We cannot do great things. We can only do small things with great love. - Mother Teresa". He observed that most of the postcards do not indicate 'Big Hairy Audacious Goals' which he has been aiming for, and recalled that quote which he first heard when he was in college. The exercise may not have helped him

readjust his life goals in big ways, but could have helped him revisit some life principles that were overshadowed along the way.

9.4 Overall Design fiction Findings

Design Fiction	Similar processes	Strengths	Weakness
Urban cultivators	Experience prototyping	- integrated with daily life - non-static interaction - sustained interest - personalistic reflection - critical reflection	- long process - requires detailed planning and preparation
Micro futures	3D prototyping What-if Storytelling	- big picture thinking - build to think (Schön, 1983) - no need to be precise - reflection-in and on-action - personalistic reflection	- time consuming - dependent on materials available
Building futures	Paper prototyping Backcasting	- simplifies complex futures - raises questions - no need to be precise - reflection-in and on-action - personalistic reflection	- difficult to express details and complexities in life - time consuming
Postcards from the future	Cultural probes Survey	- low effort - quick to reach large audiences - alternate perspectives - mediates conversations - personalistic reflection - critical reflection	- removes need for interpersonal relationships - anonymity reduces personal impact

Table 6: Summary of design fiction findings from 4 case studies

Embodiment and Ludic engagement
The participants immediately related to their customized design fiction as it appealed to their topic of interest in an intimate way. They felt special and were compelled to investigate their own futures, even when represented with materials that they are not used to. Our range of design fiction also experimented with different ways of embodiment that is enriched by the rich taxonomy collected from the first survey. 'Urban cultivators' embodied the participant's dream of doing urban farming as an experience to be uncovered over time. 'Micro futures'

helped the participant to embody their future cabin in the nature through scaled 3D models. Participant C embodied her future house through paper prototypes of blueprints, and 'Postcards from the future' embodies people's future through cultural probes (Gaver et al., 1996). Participants commented that what they have been using to contemplate about their future (e.g. spreadsheets or textual notes) were dull as compared to their design fiction.

The creative medium used in 'Micro futures' and 'Building futures' with the unique ways of interaction for 'Postcards from the future' and 'Urban cultivators' managed to displace the participants from their usual practices of future-oriented thinking. From our home interviews, we observed that people either put off far future thinking due to the lack of predictability, dream randomly or adopt a deductive and linear process which is circumstance and information-based. The playfulness behind design fictions managed to suspend people's realistic considerations and help them become comfortable working with assumptions and wildly hypothetical futures. This shift from the ordinary has led participants to new inspirational value and thinking, offering new ways of looking at the same goal. Its ludic nature did not trivialize the matter of future planning, but on the contrary, has allowed for risk and stress-free exploration of alternate futures for themselves. The design fiction pieces have supported curiosity, exploration and reflection, which is complementary to the utilitarian purpose of everyday futures. This echoes with Gaver's perspective on the need for ludic engagement in domestic technologies, akin to the role that movies, books, games or artwork play in our lives.

Open-ended and Ambiguous
At the same time, the hands-on, 'making' nature of the design fiction required time and effort. Even though one of the participants enjoyed building her future home layout using the craft materials, she still found drawing with a pen to be more efficient and intuitive. Manipulating creative media may be natural for designers, however, they may also demand a lot of effort from everyday people, inhibiting the reflective experience to a certain extent. It was also unexpected that the participants would build big picture dioramas of her future goals, instead of fragmented vignettes. This shows the importance of keeping the design fictions open-ended and ambiguous in terms of interpretation and operation, allowing participants the freedom to appropriate and ascribe meaning for themselves (Gaver et al., 2003).

The idea of open-endedness was also incorporated when we crafted the design fictions as activities instead of static objects. The activities were brought into homes to invite the participation and allow time for meaningful interaction. They were different from design fictions seen online or onsite which are usually one-off encounters. 'Urban cultivators', in particular, fostered a relationship between the participant and an imaginary character and created two-way conversation to explore narratives of the future. Although the conversation was led by the researcher behind the scenes, questions and challenges were occasionally posed to the participant to invite her to steer the conversation according to her own

interest. The communication represented a process of discovery where the participant understood more about herself and also more informed about possible futures. Even after the study, the participant is still sending related or interesting links that she comes across for the 'imaginary farmer' to read!

Provocation and Reflection
Next, as one of the biggest foci of design fiction is to provoke thinking, we found it useful to document the types of reflections that our participants carried out. Even though Valli's five types of reflection (technical, reflection-in and on action, deliberative, personalistic, and critical) are derived from teachers' education, it still provides us with a meaningful typology to dissect thoughts generated by our participants (see Table XX). Being two of the activities that required some form of construction, participants from both 'Micro futures' and 'Building futures' had to set apart time to carry out the activity. The 'Building futures' participant described that she needed to be in 'a different mind space', in order to become deeply reflective during the activity. Reflection-in and on-action happened as both participants consistently deliberated and made decisions in the process of 'constructing', e.g. choosing materials, deciding sizes etc. Personalistic reflection took place as well, when they listen to their own voice and values before imposing on their intended future (Valli, 1997). In contrast, the other two design fictions are more integrated with daily routines, keeping the moments of reflection throughout the day light and casual. Personalistic reflection was also actively carried out as participants listen to their inner voice and voices of others (e.g. postcards and imaginary farmer Jose). They also demonstrated critical reflection, when they considered and thought deeply about the multi-dimensionality of their future goals (e.g. participant with 'Urban cultivators' thought about her goal mapping into the community and commercial). According to Valli, critical reflection is the most challenging level, thus can be considered the hallmark of a thinking mind. Therefore, our range of design fictions has demonstrated that they have engendered different types of reflective activity at the end of the experiment. A longitudinal study is needed to build more understanding regarding the long-term impact of the design fiction on the individual.

10 Summary of 4 case studies

In Table 7, we summarized the thoughts and actions that resulted from the Manoa and design fiction approach. New thoughts came in the form of

- questions, "Why am I doing what I am doing?"
- confirmations, "I think I am really happy with what I have now."
- considerations, "Maybe I will do that more often."
- interests, "I might start doing more of that now."
- ideas, "I did not know I can do this."

Actions manifested in two primary ways. They either related to the method (e.g. use the Manoa method to plan for summer vacation) or resulted from the method (e.g. picked up cycling after exploring goals).

	Manoa approach	Design fiction approach
Nature	Individual led Generic / easily adaptable	Co-led by researcher & individual Specific / rigid
Outcomes	More actions More applications of method	More thoughts / inspirations More conversations of method

Table 8: Comparison between Manoa approach and design fiction approach

In general, the Manoa approach has led to more actions and the design fiction approach encouraged more thoughts. As mentioned earlier in the findings, the participants tend to use the Manoa approach to work out options instead of consequences of some future goals that they had in mind for quite some long. Therefore, these options tend to be more concrete and actionable. On the other hand, the design fiction, being crafted with specific intention, was not as flexible, but has inspired a lot of new thoughts about their future. One reason is because the Manoa method is led entirely by the individual through the externalization of his inner thoughts while design fictions provided external stimuli for new inspiration. Many of these new inspirations have led the participants to find out more about their alternate futures on their own initiative.

While more applications of the Manoa method were observed, the design fictions stimulated more conversations between the participant and people around them. Being a generic and easily adaptable framework, the Manoa approach gave the participants freedom to apply it into other aspects of their life. The intriguing and out-of-the ordinary nature of the design fictions made it more interesting for sharing shared in conversation with others.

Current practices & tools | Manoa Approach | Design Fiction Approach

Table 7: Summary of 4 case studies

Participant A
- Free-spirited
- Dependent on iPad for calendar and notes
- Lightweight strategies
- Prefers more stress-free ways of planning

Manoa Approach — Participant A

Future goal themes
- Health & Food
- Family wellbeing
- Community life

Thoughts
- Inspired to re-organize recipe folders

Actions
- Used method to plan for summer holiday
- Used method for Spanish learning
- Downloaded new mobile applications

Design Fiction Approach — Participant A

Urban Cultivators
An experience prototype of rural farming from an urban setting

Given to participant

Made by participant

Thoughts
- Wonders more about the process of getting food from 'farm to table'

Actions
- Used more Spanish in daily life
- Went to find out more about the country
- Found and read more links about community farming

Participant B
- Imaginative, does a lot of far future planning with partner
- Dream folder for inspiration about secret futures
- Pinterest boards for future home
- Sketches of future garden

Future goal themes
- Photography
- Outdoor lifestyle
- Design for sustainability

Thoughts
- Did mapping exercise with partner to dream about future homesteading

Actions
- Picked up cycling
- Introduced herself to the company director

Thoughts
- Consider doing life planning quarterly instead of yearly

Actions
- Used the map to evaluate two forms of diet
- Made plans to achieve better personal well-being

Micro Futures
A photography toolkit to construct scenes of fictional futures

Given to participant

- Rain clouds generator & solar powered cabins
- Underwater tents, camping & submarine shuttles

Made by participant

Thoughts
- How she should manage her finances with her new goals
- Start considering areas to live in the city

Actions
- Showed her partner the pictures that she took
- Shared with her co-workers about making dioramas of the future.
- Added to Pinterest collection

Participant C
- Organized, meticulous and rigorous
- Trello for daily task planning
- Meal and travel planning templates
- Future project folders with event brochures
- Futures wheel for yearly planning

Future goal themes
- Purchasing property
- Work life balance
- Security in career and life

Actions
- Added new notes in Evernote
- Posted on career choices on Facebook to solicit responses

Building Futures
A toolkit to create diagrams of your imagined future data

Given to participant

- Infographics of future home layouts, time spent in each room, time spent per week in the house.

Made by participant

Thoughts
- How she should manage her time at work and personal
- Raises questions about her weekly activities
- Considered more variety of options of houses
- Considers energy savings and living with aged parents.

Actions
- Revisited an exercise she did previously
- Active lookout for houses during morning exercises
- Shared with sister the house layout and got feedback on it.
- Visited a real estate website to browse

Participant D
- Reflective, self-aware
- Post-it notes to isolate important goals
- Inspirational quotes to guide principles
- Whiteboards for life planning
- Evernote to consolidate small thoughts about the future

Future goal themes
- Lifelong legacy
- Self awareness
- Purposeful living

Postcards from the future
Stamped postcards with future-related questions to be handed out to people

Given to participant

Made by participant

Actions
- Added an email footer to his settings

11 Discussion

FOR INTERACTION DESIGNERS
Designing for Everyday futures

During the explorative phase of this study, we uncovered five types of everyday futures and the experiential qualities each entailed. In Břdker's paper, she strongly recommended that the Second and Third wave of HCI can be more tightly integrated. Future focused planning tools and applications available in the market are predominantly centered around pragmatic needs, like accuracy, efficiency, tracking milestones, etc. From the home interviews, we noticed that people do not always find a need to fulfill all their dreams, goals or plans. They find much enjoyment in the process of future thinking as well, where they can experience emotional qualities like optimism, a sense of purpose or self-indulgent dreaming. Through our design fiction experiment, we also showed that the exploration of futures itself is fruitful, even without the execution, as people continue to clarify their uncertain future overtime. Therefore, we urge interaction designers to consider experiential qualities and alternate futures when designing future-oriented applications (e.g. for financial planning, job search, wedding planning or weight loss).

FOR DESIGN RESEARCHERS
Designing for one - individualized design

A distinctive part of our study was the case studies where we personalized design fictions specifically for each individual. Even though we were only dealing with a small sample size of 4 participants, it still demanded a great deal of effort to build relationships and understand each individual deeply. Crafting unique design fiction pieces that are relevant to their theme of future goals and appealing to their personality and lifestyle, required significant observation, attention and time.

In the context of everyday futures, where every individual's future is nuanced in very personal ways, it made sense for us to spend the effort to conduct deep interviews and customize designs, catering to their preferences and needs. Even if two of the participants have the same future goal, we understand that the activities need to differ to complement their current habits and interests. Also, while we studied people's artifacts to get a glimpse of their planning practices, we realized that a lot of future thinking is situated intangibly in one's mind. Doing one-to-one design sessions helps by giving more time and attention to uncover unarticulated thoughts that might be missed if more efficient research methods like surveys or focus groups are conducted. Similarly, we suggest such an individualized research process for future topics that are highly subjective, and where thoughts on the subjects are mainly internal, rather than expressed externally.

The experiment was conducted with 4 people over 2 months. The stories we captured are detailed, genuine documentations of real people dealing with uncertain futures. We see the narratives from each individual as mini autobiographies of a section of their life. We can imagine that if design researchers continue to collect and share such stories of individuals, the design community will benefit from a rich and useful resource to formulate personas for future product development (Cooper, 1999). An extensive collection, representing people from different ages, stage of life and cultures, can play a crucial role in enriching future design projects with user data that is not easily accessible.

Despite the process being time-consuming and labor intensive, as a design researcher, this is one rare project that I got to know my participants at such an intimate level. I built empathy and learnt to see them as people, instead of users of my design. Through the time spent in each session, they began to trust me as a friend, and shared struggles about their uncertain futures openly with me. They became less embarrassed to share their closest dreams and some even became more convicted about their goals. One of them asked if I had heard of 'art therapy' and commented that this project can be considered as 'design therapy'!

FOR DESIGN FICTION PRACTITIONERS
What else can design fiction do?

We brought futures and design fiction methods out of the lab or showroom and directly into the homes of people. Instead of tackling the wicked problems of this complex world and presenting responses to people, we tackled the challenging problems of one's self and presented or co-presented responses back to the self. Using open ended and interactive design fictions, we invited participation from the individuals and evoked curiosity, thoughts and discussion.

Through our experiment, we would like to suggest two new possibilities for designers practicing design fiction to have more direct impact in the lives of everyday people, (1) bringing design fiction research into the domestic sphere, (2) create a bottom up participatory approach through open ended design fiction.

There are other examples of critical and speculative design being brought into homes of people, such as the Placebo project[5] and the Drift Table (Gaver et al., 2004)..Although exhibiting designs in galleries and online media can reach more people from the public, we propose a more targeted approach by bringing the designs to the people. Firstly, participants can gain close interaction with the designs for a longer period of time, allowing more thoughts to be generated at different moments of the day. As compared to the few minutes spent in front of an exhibit, participants now have undivided attention with one design,

---

[5] http://www.dunneandraby.co.uk/content/projects/70/0

without the hurry to visit other exhibits. Even though the designs are simply placed in their homes, if given the liberty, people can take ownership of them, integrating them into their environment and lives. They are no longer just viewers of design fictions but co-creators of them.

Design fiction offers a critical lens to look at emerging, wicked problems. Through such visions of the future, we begin to think deeper into our present and take progressive action towards our future. However, such criticality is not easily encountered and practiced in the everyday. In his paper 'A sustainable design fiction', Wakkary attempted to move design fictions closer into the everyday, by suggesting how designers can play the intermediary role of translating future design fictions into blueprints for everyday DIY-ers to realize in their own lives (Wakkary & Maestri, 2007). Similarly, we bring forward opportunities for design fiction practitioners to adopt a facilitator role in co-designing fictions with individuals to reflect and explore their own probable, possible and preferable futures. While there are a plethora of tools to help people work pragmatically towards their future goals, we find that design fiction can add new perspectives by supporting individuals in freely explore alternate goals and consequences. That said, a big part of design fiction is centered on bringing awareness to challenging issues that the world is facing. We suggest starting ground up from people's futures, which they deeply care about, and gradually revealing the bigger world picture within which their individual futures play a part. Our study showed that when approached this way, participants were more intrinsically motivated to expand their thinking from the self to the world around them. Design fiction can therefore serve as the seed of thought that inspires individuals to expand their worldly thinking based on their own interest and beliefs.

12 Limitations & Future Work

The duration of our study is comparatively short, relative to our participants' future timelines. The futures we discussed together ranged from almost immediate plans, to five to ten years out aspirations, and even to lifetime commitments. Given these timelines, the duration of our study is very short for adequately evaluating the full impact of the methods on our participants' futures. In addition, most of the participants found the study 'fun' and 'engaging', but open questions remain about the challenges of integrating and sustaining the use of these methods over time. Periodical check-ins with the participants over a longer period can reveal how participants continue to appropriate or even abandon the methods in their existing practices.

As the focus of our project is still mainly design driven, we spent more time experimenting with the design fiction method and only tried out one method from futures studies. Future work can include bringing other established methods in futures studies into the domestic sphere to provide people with a wider array of future-oriented tools.

13 Conclusion

We argued that work from futures studies and design fiction is currently limited by frameworks of distribution and publication. We revealed the potential application of future studies and design fiction methods for personal futuring. We conducted a survey and home interviews to understand people's futuring practices through personal possessions. Our analysis provided further evidence that there are experiential qualities in everyday futures that can be addressed by our methods. We presented four case studies whereby the Manoa approach and customized design fictions were employed. We ended by describing how our methods has informed everyday futures and also how our method of crafting individualized design fictions in the domestic sphere can be useful for interaction designers, design researchers and design fiction practitioners.

To summarize, everyday people, futurists, designers are all alike, in the sense that we wonder about and prepare for the future. Everyday people dream about the future for themselves, while the latter two professionally dream about the future of the world. This study aimed to find a way to integrate both perspectives. By redesigning established research methods into accessible daily tools, we aim to empower everyday people with alternative ways to question their possible, probable and preferable futures.

14 References

1. Allen, D. (2001). Getting things done: the art of stress-free productivity. New York: Viking.

2. Aspinwall, L. G. (2005). The psychology of future-oriented thinking: From achievement to proactive coping, adaptation, and aging. Motivation and Emotion, 29(4), 203-235.

3. Bell, G., Blythe, M., Gaver, B., Sengers, P., Wright, P. (2003). Designing culturally situated technologies for the home. In CHI '03 Ext Abs on Human Factors in Computing Systems, 1062-1063.

4. Bell, W. (1997). Foundations of Futures Studies, vol. 1, NJ: Transaction Publishers

5. Bishop, P., Hines, A., & Collins, T. (2007). The current state of scenario development: an overview of techniques. Foresight-The journal of future studies, strategic thinking and policy, 9(1), 5-25.

6. Bleecker, J. (2009). Design Fiction: A Short Essay on Design, Science, Fact and Fiction, (March).

7. Blythe, M. A., & Wright, P. C. (2006). Pastiche scenarios: Fiction as a resource for user centred design. Interacting with computers, 18(5), 1139-1164.

8. Břdker, S. (2006). When second wave HCI meets third wave challenges. Proceedings of the Nordic conference on Human-computer interaction: changing roles, 1-8.

9. Buchenau, M., & Suri, J. F. (2000). Experience prototyping. InProceedings of the 3rd conference on Designing interactive systems: processes, practices, methods, and techniques (pp. 424-433). ACM.

10. Cooper, A. (1999). The inmates are running the asylum: Why high-tech products drive us crazy and how to restore the sanity (Vol. 261). Indianapolis: Sams.

11. Csikszentmihalyi, M., & Halton, E. (1981). The meaning of things: Domestic symbols and the self. Cambridge University Press.

12. Curry, A., & Schultz, W. (2009). Roads less travelled: different methods, different futures. Journal of Futures Studies, 13(4), 35-60.

13. Dator, J. (1998). Introduction The Future Lies Behind! Thirty Years of Teaching Futures Studies. American Behavioral Scientist, 42(3), 298-319.

14. Davidoff, S., Lee, M. K., Dey, A. K., & Zimmerman, J. (2007). Rapidly exploring application design through speed dating. In UbiComp 2007: Ubiquitous Computing (pp. 429-446). Springer Berlin Heidelberg.

15. Davies, C; Sarpong, D. (2013). The epistemological relevance of the arts in foresight and futures studies. Futures, 47 1-8.

16. Djajadiningrat, J. P., Gaver, W. W., & Fres, J. W. (2000, August). Interaction relabelling and extreme characters: methods for exploring aesthetic interactions. In Proceedings of the 3rd conference on Designing interactive systems: processes, practices, methods, and techniques (pp. 66-71). ACM.

17. Drucker, P. F. (1954). The practice of management. New York: Harper & Row.

18. Dunne, A. (2000). Hertzian Tales: Electronic Products, Aesthetic Experience & Critical Design. Art Books.

19. Dunne, A., & Raby, F. (2013). Speculative Everything: Design, Fiction, and Social Dreaming. MIT Press.

20. Ehn, P. (1988). Work-oriented design of computer artifacts (Vol. 78). Stockholm: Arbetslivscentrum.

21. Friedman, S. L., & Scholnick, E. K. (Eds.). (1997). The developmental psychology of planning: Why, how, and when do we plan?. Psychology Press.

22. Gaver, W., Dunne, T., and Pacenti, E. Cultural probes. Interactions , ACM Press (1996), 21-29.

23. Gaver, W. (2001). Designing for ludic aspects of everyday life. Ercim News, 47, 20-21.

24. Gaver, W. W., Bowers, J., Boucher, A., Gellerson, H., Pennington, S., Schmidt, A., ... & Walker, B. (2004, April). The drift table: designing for ludic engagement. In CHI'04 extended abstracts on Human factors in computing systems (pp. 885-900). ACM.

25. Gaver, W. W., Beaver, J., & Benford, S. (2003, April). Ambiguity as a resource for design. In Proceedings of the SIGCHI conference on Human factors in computing systems (pp. 233-240). ACM.

26. Harrison, S., Tatar, D., & Sengers, P. (2007). The three paradigms of HCI. alt. chi.

27. Hassenzahl, M., & Tractinsky, N. (2006). User experience-a research agenda.Behaviour & Information Technology, 25(2), 91-97.

28. Inayatullah, S. (1998). Causal layered analysis: poststructuralism as method.Futures, 30(8), 815-829.

29. Mankoff, J., Rode, J. A., & Faste, H. (2013, April). Looking past yesterday's tomorrow: using futures studies methods to extend the research horizon. InProceedings of the SIGCHI Conference on Human Factors in Computing Systems (pp. 1629-1638). ACM.

30. Miller, R. (2006). Futures studies, scenarios, and the "possibility-space" approach. SCHOOLING FOR TOMORROW, 58.

31. Müllert, N., Jungk, R., & Institute for Social Inventions, London (United Kingdom);. (1987). Future Workshops: How to create desirable futures. London.

32. Norman, D. (2004). Emotional Design: why we love (or hate) everyday things. Basic Books.

33. Odom, W., Pierce, J., Stolterman, E., & Blevis, E. (2009, April). Understanding why we preserve some things and discard others in the context of interaction design. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (pp. 1053-1062). ACM.

34. Reeves, S. (2012). Envisioning ubiquitous computing. Proceedings of the 2012 ACM annual conference on Human Factors in Computing Systems – CHI '12, 1573.

35. Rittel, H. W., & Webber, M. M. (1973). Dilemmas in a general theory of planning. Policy sciences, 4(2), 155-169.

36. Sanders, L., & Stappers, P. J. (2012). Convivial Design Toolbox: Generative Research for the Front End of Design. BIS.

37. Schön, D. (1983). The Reflective Practitioner. London: Temple Smith.

38. Shove, E., Pantzar, M., & Watson, M. (2012). The dynamics of social practice: everyday life and how it changes. Sage.

39. Singer, J. L. (1975). The inner world of daydreaming. Harper & Row.

40. Sterling, B. Design fiction. Interactions 16, 3 (May 2009), 20-24

41. Tanenbaum, J., Tanenbaum, K., & Wakkary, R. (2012, May). Steampunk as design fiction. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (pp. 1583-1592). ACM.

42. Taylor, A. S., & Swan, L. (2005, April). Artful systems in the home. InProceedings of the SIGCHI conference on Human factors in computing systems (pp. 641-650). ACM.

43. Wakkary, R., & Maestri, L. (2007, June). The resourcefulness of everyday design. In Proceedings of the 6th ACM SIGCHI conference on Creativity & cognition (pp. 163-172). ACM.

44. Wheelwright, V. (2006). Personal Futuring: A Step-by-Step Guide. Futurist,40(3), 22.

45. Zimmerman, J., Forlizzi, J., and Evenson, S. (2007). Research through design as a method for interaction design research in HCI. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems. 493- 502.