Situated: Reconsidering Context in the Creation and Interpretation of Design Fictions

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IDEO

Design fiction and ethnographic methods strengthen each other by creating a creative but rigorous scaffolding for interrogating expectations and reactions to the future. Design fiction can influence the activities, people, and places in which ethnography is done, and ethnography can create design fictions. Viewers and creators populate design fictions with their own past, present, and hoped for future. The intersection of these methods push ethnography beyond the edges of its thoughtful consideration of the present moment, in order to begin investigating the future.

INTRODUCTION

The uncertainties of the future confront communities, organizations, and businesses. Since the 1960s, they have turned to studying the future with the hope of effecting change by acting towards preferred outcomes. Expanding a time horizon is a perspective shift used to spur action on pressing issues such as technological change and resource shortages. Futurists are fond of Eliel Saarinen's reminder that one should, "Always design a thing by considering it in its next larger context—a chair in a room, a room in a house, a house in an environment, an environment in a city plan,"(Keller 2015). The future and the past offer the next larger context to the present. By contrasting the environment, behaviors, and attitudes of the design fiction with those of the real world it is revealed in, project themes and goals are re-contextualized and therefore better understood. For applied professionals, the fusion of futures thinking and ethnography also offers the tacit allure of growing the scope and impact of the design process beyond the typical product or service development cycle.

Future oriented approaches are increasingly branded and marketed by design firms and other agencies.[1] The US military and think tanks like the RAND corporation began to deploy these methods at the mid-century (Bell 1996). Shell Oil used scenario planning in the 1970s to evaluate long term decisions. "The scenario planning exercise led Shell to adjust its business management practices to hedge against the potential for high oil prices by increasing the efficiency of its refining and shipping operations" (Peterson, G. D. et al. 2003: 363). The company's performance during the oil crisis endorsed the method in corporate settings. In the 1980s and 90s, scholars and designers formalized anticipatory anthropology and futures studies methodologies. These included design fictions, the idea of "designing *with* stories, or within the world of a story" (Lindley, J. et al. 2014: 241). The value of futures perspectives is a call to action, and design fictions are the means by which to induce the first steps. Robert Textor, an anthropologist who pioneered the fusion of futures thinking and ethnography, argued that "Systematic anticipation can thus serve as a powerful means for

[1] As covered in industry-oriented online publications such as Fast Company and The Verge.

clarifying and prioritizing the values held by an individual, a community or a society" (Textor in Mead 2005: 20). However, literature indicates a need to theorize and populate with examples the intersection of ethnographic and future studies methods in applied settings.[2]

This paper argues that in order to diversify the design process, the perspectives of stakeholders should be compared and contrasted among themselves, as well as that of the internal world of the design fiction. Supporting examples include original research commissioned by clients and first-hand experience in a community workshop series. Textor reminds us that, "There are no future facts. There are only facts about the past or present that a researcher... regards as relevant to the future" (In Mead 2005: 19). The facts deemed relevant by viewers in these case studies, even if inconsistent or extraneous to the design fiction, are necessary and relevant to its application. Design fictions do not have to be interpreted as a standalone world. The real world context influences the interpretation and reception of the narrative. This can include aspects of the environment like the informal economy and condition of infrastructure, or the behaviors and attitudes for which participants were screened for. In other words, ethnographic methods recontextualize the scenario described by the design fiction artifacts. For example, exploring a resource short, population dense scenario in urban China allowed a turning inside out of the design fiction into the ethnographic present context. This allowed a team working on a mobility project to amplify signals of the future that were weak in the present. Analysis of team, client, and participant reactions led to insights and final recommendations.

Because ethnography treats context as an inductive and guiding source of knowledge, design fictions activate and are activated by ethnographic methods. The use of the methods in combination explores assumptions by highlighting differences and similarities in the context of the real and design fiction world, including in the surrounding environment, structural factors, and positionality of the researcher and participants. An ethnographic approach can be influenced at different phases by the creation, selection, and interpretation of design fiction. First, the design fiction can inform the questions and activities in a research plan, including participant and site selection. Second, ethnography can help frame and illustrate a range of design fictions. Granularity, texture, and stories from the field can be adapted into the design fiction and then interpreted back out. In this case, the design fiction is a time machine that represents present expectations and desires for the future. Third, the design fiction serves as a scaffolding for analysis and synthesis, through which to compare and contrast observations and interpretations among team members. It focuses interpretation efforts and insists on a question that must be acknowledged by the group.

OVERVIEW OF APPLIED FUTURE-ORIENTED APPROACHES

Design is a forward-looking and optimistic process, particularly when considered through a capitalist lens. Brown and Wyatt describe this as: "Design thinking—inherently optimistic, constructive, and experiential—addresses the needs of the people who will consume a product or service and the infrastructure that enables it" (2010). Incorporating futures perspectives in design ethnographies expands the scope of impact beyond typical product

[2] Lindley, J. et al. 2014 on design ethnography approaches and Greenman, A. et al. 2006 on an "ethnographic walking tour" to enhance foresight exercises.

cycle timeframes and avoids "tempocentrism" in resulting recommendations.[3] In consulting and corporate strategy, companies seeking to establish multi-year visions have engendered an interest in forward-looking but predictive methods such as forecasting and trend research.[4] Anticipatory ethnography provides an alternative to singular predictions by embedding the generative potential of multiple futures within organizational decision-making.

The design field's focus on problem-solving assumes that market-based solutions can and will be found. Critical design, which emerged in the 1960s in relation to avant-garde art, began questioning practitioners' relationship to their discipline and the larger economic system. Emerging out of this movement, speculative design holds that traditional design supports the status quo by introducing new products to resolve "'problem' of technological alienation" (Mitrovi 2015). Practitioners like Mitrovi believe that, "speculative design envisages and anticipates the future, at the same time helping us to understand and re-think the world of today." The corporate adaptation of speculative design, which can represent market-neutral or market-agnostic worlds, provides an opportunity to examine how the methods express themselves in applied settings.

Design fictions are a type or subgenre of speculative design, often in the form of videos, installations, magazines, or other mediums, which imply an internally consistent world story. For example, the firm Superflux produced a video featuring lime green colored smart objects like a fork and a cane that illustrates how these objects might control the behavior of an elderly man (2015). The video implies the world that these objects belong to, as well as its social and political dimensions, without overtly explaining the designed objects and their function. In another example, the Near Future Laboratory produced their own version of an IKEA catalog. The catalog uses images and descriptions that reflect the economic and technological forces that inform the everyday by featuring "self-subscribing" products and services (ikea.nearfuturelaboratory.com). "While both design fiction and speculative design operate around the basis of some form of prototype, speculative design typically creates objects outside of a defined future context, and doesn't include an accompanying narrative" (Dunne and Raby 2014 cited in medium.com). Futurist Bruce Sterling is a main proponent of design fictions as "diegetic prototypes," primarily objects but even services and interactions that are taken for granted as functional and native to the world around them (slate.com). He cites the iPad-like object in Space Odyssey 2001 as one of the best design fictions in a science fiction movie because, "You see an iPad in this movie and your response is not just, 'Oh, what's that's that?' But 'That would be cool if it existed.'" A design fiction includes its own context: the environmental, behavioral, and attitudinal factors that impact the interaction between human and object or system. It allows us to wonder how the world might evolve from the present context to the one it portrays.

While speculative design combines commercial and artistic practice, futures perspectives have a similar mixed background of military and corporate strategy, social science, and other fields. Futures perspectives developed through applied approaches by the military and think tanks like the RAND corporation (Bell 1996). As described earlier, "In the early 1970s, Shell Oil used scenario policy planning to evaluate long-term decisions" (Peterson, G. D. et al. 2003: 363). Jim Dator, a political scientist at the forefront of developing future studies, describes it as a field that "is interested not in itself furthering any

[3] Textor describes tempocentrism as akin to ethnocentrism, in which we take for granted the situations and values of our own time frame (2005:17).
[4] See profile on Tellart in The Verge, an online tech-oriented publication (Chayka 2017).

particular view of the future, but rather in furthering both narrowly professional as well as broadly participative inquiry into the future" (1998). Others like Robert Textor merged future studies with anthropology through methods such as the Ethnographic Futures Research interview protocol, which focuses on participant expectations for optimistic, pessimistic, and probable scenarios of the future. "EFR aims to produce meaningful anticipations of the future grounded in a specific sociocultural context," (Ketudat, S., & Textor, R. B. 1990). EPIC papers such as Lindley, J. et al. (2014) on "Anticipatory Ethnography" have considered "connecting the dots" between design ethnography and design fictions, though indicate a need for practical examples to advance the theory. These approaches are branded by design firms and other agencies, including in projects like the Museum of the Future in Dubai. "In Tellart's imagined future, the UAE of 2050 has it covered. In the projection, Emirati scientists combine the genes of jellyfish with mangrove roots, one of nature's best desalinators, to create an 'organic filtration plant that allows you to produce drinkable water out of the ocean,' Scappaticci explains" (The Verge 2017). Expanding a time horizon is a perspective shift used to increase awareness of pressing issues such as technological change and resource shortages.

Anthropology and future studies intersect at a desire to affect positive change. Textor argued that, "The proposal is made that an anticipatory dimension to anthropology should be developed for the purposes of increasing anthropology's capacity to: (1) explain sociocultural change, and (2) contribute to the making of effective proactive public policy" (1985). Hybrid techniques[5] have shown potential to engage communities in conversation and action around the future. Lindley, J. et al. argue that "We believe design ethnography and design fiction can be configured to work together so that the problems of one are solved by the strengths of the other, and vice versa" (2014: 238). Past work describes these techniques as a catalyst for participatory conversation that can lead people to take action towards preferred outcomes. For example, Stuart Candy describes working on an installation with the University of Hawaii around the four future scenarios of Hawaii in 2050: "None of these was intended to be taken as either advocating or predicting a particular path; the aim was instead to promote a broadened sense of what the possibilities could be" (2008). The artifacts that design fictions produce – objects, sketches, and spaces – are the primary stimuli for discussion of the potential futures of a place, community, or topic.[6] The AAA awards the Robert B Textor and Family Prize for Excellence in Anticipatory Anthropology. [7] The hope is that this type of work will result in structural or individual change like policy decisions or consumption choices. For corporate organizations, design fictions can serve as a generative tool of design that also provide organizational benefits, such as cross-disciplinary collaboration and alignment on strategy.

INTERSECTING DESIGN FICTION AND ETHNOGRAPHIC METHODS

The benefits of integrating design fiction into an organization's research and design toolkit

[5] Including anticipatory anthropology, anticipatory ethnography and speculative design
[6] At the launch of the speculative design major at the University of California, San Diego, Benjamin Bratton argues that these objects pose an alternative to the mainstream (2016).
[7] "Such contributions will allow citizens, leaders and governments to make informed policy choices, and thereby improve their society's or community's chances for realizing preferred futures and avoiding unwanted ones." (AAA website)

include minimizing organizational risks, catalyzing cross-disciplinary collaboration, and creating a more holistic understanding of the experience surrounding a potential product. Combined with futures perspectives, as in scenario planning or critical uncertainties exercises, the navigation of multiple potential futures is an input into organizational strategy decisions. These methods can account for tempocentrism by expanding to a time frame that encourages teams to think beyond the next product development cycle. Like speculative design, design fiction can spur discussion and action. To go back to the Hawaii 2050 event, Candy described that, "It is planned as a kickoff for a series of community discussions about what I and my futures colleagues describe as possible, probable and preferable futures for the islands, all of which should culminate in A Sustainability Plan for Hawaii" (2008).

Intersecting design fiction with ethnographic and qualitative research provides more specific benefits. First, defining what the team hopes to learn and how the design fiction relates to these goals begins the work of team alignment and rapport. Second, the design fictions and their artifacts function as boundary objects, allowing interpretation by different communities and introducing non-verbal questions that we may not know how to ask (Cooper-Wright 2012). Third, design fictions as a tool for participant feedback offers a defined means of input for the conversations design fictions claim to create. Fourth, the methods and tools of design fictions become a mode of inquiry in and of themselves. One can as easily explore an element of the design fiction with participants as the fiction itself. In other words, the scaffolding of the fiction is as generative as the self-contained artifact.

This paper focuses on ethnography with and around design fictions – the world around the concept or idea – as a process to generate and diversify design solutions. This stands in contrast to the high-production installations produced to communicate an organization vision (Chayka 2017). Previous work argues that situating a design fiction by providing the context that makes it a standalone and believable world is key to its interpretation. "A healthy design fiction 'situates' the viewer in a prospective future so they can envision it in a meaningful way" (Lindley, J. et al. 2014: 241). This paper responds that comparing and contrasting the real context of the viewer to that of the internal world of the design fiction is a relevant and effective means of interpretation. Contextual factors may include but are not limited to the environmental factors around the viewer, or their behaviors, attitudes, and demographic criteria. Differing perspectives among audiences – research participants, design team members, and clients – recontextualize the design fiction and generate additional insight and ideas. Unlike linear or even iterative product development, this process introduces multiplicity and branches within the development process that may mitigate risk by preparing the organization for multiple outcomes.

CASE STUDIES

This paper considers examples from three case studies to argue for a fusion of design ethnography and futures approaches which foregrounds context as a site of contestation by multiple perspectives. Two examples are on the topics of personal mobility and home kitchens, and use ethnographic methods such as in-context interviews, participant observation, and open-ended concept feedback. The third is a community-based workshop series on the social impact of augmented and virtual reality technologies. The creation and debate around the potential futures is examined, including the analysis and synthesis of these perspectives alongside the creation of the potential futures into actionable outcomes.

The case studies below represent three different ways in which speculative design has been adapted as a generative tool. By having the methods of design fictions become a site of discussion, production, and contestation, the design fiction itself is not the only provocation. Specifically, the world of the design fiction becomes a research tool, rather than a finished communication. Design fictions shift the uses of ethnography in several ways: 1) by influencing the questions, activities, and participants that are included in the project, 2) populating design fictions with stories and characters, 3) providing a prototype that serves as a tangible prompt around a key project theme, throughout research, analysis, and synthesis.

Concept Kitchen 2025

Concept Kitchen 2025 is a collaboration between IKEA, IDEO, and students from Lund and Eindhoven universities "to explore the social, technological, and demographic forces that will impact how we behave around food in 2025" (2015). Based on the students' research into attitudes and perceptions around cooking and eating, concept products were built with guidance from IDEO designers. In 2015, a full-sized kitchen was built with IKEA, exhibited at the Salone Del Mobile in Milan and EXPO Milano (see Figure 1). The kitchen represents an assemblage of speculative design objects, but the collaging of products and the common themes across design principles can be argued to form a design fiction. The research process began with ethnographic interviews with participants such as utensil makers and sustainable architect, selected in order to glean insight into what the future of food, family, and home might bring. Secondary research included in the brief to students filled out STEEP-like details (social, technological, environmental, ecological, and political signals). Students then conducted individual and group explorations into topics such as food and water waste.

During the second phase, extreme users such as an arctic explorer and insect diet proponent helped explore the changing relationships with food. In combination with observation and in-context interviews, boundary objects focused discussion on key project themes such as avoiding waste. This primary research, combined with trends and drivers, helped the team design with the implications of the future in mind. For example, what happens when drones make shopping easy and delivery almost instantaneous? (See Figure 2 induction cooling shelf, which creates visible storage to encourages the preparation of fresh food). The students' ideas were synthesized into principles that structured the final kitchen, such as Mindful Design: "Crucial to the success of the project was preserving the tactile creative pleasure of the kitchen. Technology could easily make the space feel robotic and sterile, but this project was guided by the need to use tech to enhance the kitchen's warmth."

The resulting exhibit and the interactions it implied was a "tangible communication of the behaviors of the future," in the words of one of the IKEA team members. An IDEO designer described how having subtle behavior changes come across in an exhibition was particularly challenging. For example, "The Mindful Sink pushes us to be more conscious of our water consumption with a basin that pivots left and right. It must be tipped to one side to drain toxic, or 'black' water, and the other for safe 'grey' water, which can be filtered and used in a dishwasher or as nourishment for the cooking herbs that grow above the sink" (see Figure 3.) Bleeker writes that, "A narrative that focuses too much on the technological gadgetry quickly loses its critical value by no longer providing the provocations that design fiction can offer" (2009: 27 cited in Levine 2016). The Concept Kitchen 2025, its name

recalling concept cars, some of the original speculative design objects, lives closer to a design fiction by uniting the concepts through human centered but future oriented design principles such as Mindful Design.

Figure 1. Concept Kitchen 2025 website imagery

Figure 2. Concept Kitchen 2025 induction cold storage concept

Figure 3. Mindful Sink concept

Augmented Realities Workshops

The second example is a series of workshops with design and social impact community members in Chicago, which pivoted around "critical uncertainties" and visual prompts in order to have participants create their own design fictions. The workshop asked participants questions to probe on the potential of augmenting social impact through VR / AR / MR technology. In order to situate the technology in social, economic, or other contextual factors, a 2x2 was drawn around the critical uncertainties selected. The first critical uncertainty was whether individual or collective action is key, and the second if technology becomes more immersive or more augmenting of the real world. A demo of Google Tiltbrush was available so that participants could experience the technology first-hand. Prompts in the form of images and a set of cards with emotions and activities were made available to the group (see Figures 4 and 5). After small group activities, a facilitated conversation took place. Key questions surfaced included:

- How might experiences of different bodies and genders inform social impact work?
- How might experiences that substitute for the real address or exacerbate inequality? e.g. VR travel for those who can't afford it in real life
- When and how does the experience begin and end? Why does it matter?

The participants were given the raw materials to form a design fiction, and began taking the first steps in delineating those worlds. Ideas included time limits and immersion rooms that would help future users control the amount of spent plugged in. These got as detailed as particular interactions regarding how one begins a non-gendered interaction in a VR / AR / MR experience, by perhaps molding one's own body out of a clay-like substance. By giving participants with related work and life experience the elements of a design fiction – technical as well as social contexts, immersive prompts, and a space to debate – new forms of the technology began taking shape based on the issues these worlds would confront. The context of their lives as designers and activists was funneled into these potential futures.

Figure 4. Augmented Realities workshop image

replace	sadden	excite	amuse
confuse	shake	globalize	localize
remember	attach	mark	store

Figure 5. Augmented Realities workshop cards as prompts

While the Augmented Realities workshop was not an ethnographic research interaction, it does suggest other uses of the method in more structured projects. Having the raw materials of a design fiction available on hand, in this case VR, images, and card prompts, encourages investment by the group in their feedback. During research, these materials create a tangible reminder of what we need to learn, and encourage the team to engage in framing the problem space. Like Concept Kitchen above and the personal mobility case study below, there are also implications for participant and site selection. We can consider the environmental, behavioral, demographic, or other criteria that signals indicate may play a significant role in future worlds. Finally, people populate design fictions with their own past, present, and hoped for future. These methods push ethnography beyond its thoughtful consideration of the present moment, in order to begin investigating the future.

The Future of Personal Mobility

The third example demonstrates the benefits of this approach in a multi-phase program, in which the design fictions were able to inform not only prompts but also participant and site selection. This is the turning inside out of the context – the story of the design fiction into the stories of the real world - that allows the design fiction to be a tool for inquiry as well as a final product. This project dealt with personal mobility within a 15-year time horizon. Methods were informed by an anticipatory anthropology protocol, elements of scenario planning, speculative design, and ethnographic futures research (based on Textor's work). The first phase used secondary and ethnographic research to create a set of four potential futures around mobility. For each of these futures, an animated narrative around a central character described their mobility story. For example, one narrative followed the lives of a family in a resource short, informal settlements. Communal bonds and technological changes like cryptocurrency and 3D printing allowed for the adaptation of community resources to move goods, create work, and stimulate the informal economy. This design fiction included the product ecosystem, but did not highlight it as the central element.

Figure 6. Two cardboard circles with removable stars on them that represent a user's profile rank based on data such as social media, job reviews, and operation history. Higher rank gives you more access to tools, job offers, and other rewards. In the activity, the participant was asked to share their status with the interviewer, and in what situations they would or would not do so.

The four potential futures were then used to select locations and participants for additional ethnographic research. Essentially, the team scanned the world for a divergent set of environments, behaviors, and attitudes highlighted in the design fictions. The design fictions were also used as prompts in the field, particularly with subject matter experts. Informed by Textor's EFR protocol, discussion questions included participants' reactions to the fictions – the optimistic, pessimistic, and likely implications of such a future. For example, Nairobi represented a location with a high rate of informal settlements and informal economy. Infrastructure barriers encouraged technological leapfrogging like mobile payments, the design fiction turned inside out into a best guess current context. The overarching narrative, and ideas linked with these worlds, allowed participants to project

their reaction to the underlying assumptions that informed the idea. On the surface, this looked and sounded like concept feedback. In the background, this allowed the team to tangibly explore the assumptions of the design fictions. Opportunity areas for the long-term emerged, as well as near-term designs representing the first step in these directions.

IMPLICATIONS

Looking across these case studies, implications emerge for the creation and interrogation of design fictions as a qualitative research tool. Rather than a finished provocation expressing the outcomes of a process, making and sharing a design fiction can be a valuable tool for generating insight and ideas. In particular, design fictions and ethnographic methodology shape each other through 1) influencing the selection of research sites and participants with the expertise and experience that provide analogies to the world of the design fiction, 2) using ethnography as a source to create design fictions, 3) introducing an ethnographic approach to analysis by comparing and contrasting the reactions of different viewers who co-create the design fiction, and 4) instilling branching, tension, and contradiction into the design process (as opposed to linear or even iterative processes).

The first productive intersection in these projects came from using elements of the design fiction to select locations and participants for ethnographic research, in order to respond to the challenge of researching future implications in the present context. In the language of futures thinking, this helped amplify the signals of the future that may be weak in the present, whether those signals take the form of technologies like cryptocurrency, attitudes around sharing and self-sufficiency, or a fragmented geopolitical system. The mobility project was able to investigate the assumptions of the design fictions through the context of participants' experiences. For example, this included finding subject matter experts working in relevant contexts, such as fintech in Kenya and energy in Korea. The team also drew on the context of participants' lives to explore the shape mobility might take. For example, shipping and delivery in Seoul, the capital city of Korea, a country recognized for infrastructure investments and high R&D spending. For the Augmented Realities workshop, participants with a background in social impact were invited for the expertise they had based on the context of their work. By reflecting on images and a set of cards listing emotions and activities, they began to infuse the space around the technology with narratives from their own lives. Concept Kitchen 2025 did not fully explore this territory, but revisiting the project might suggest setting up the kitchen in contexts suggested by the themes it explored, such as mindful consumption and multipurpose environments. For example, installing it in a co-op, utopian community, or dormitory and letting residents interact with it there. An EFR-oriented discussion guide could explore its applications: what would people do, store, prepare, and eat in this space? Who would be with them? What are the implications, benefits, or drawbacks of this speculative object assemblage in comparison to how they currently do things? By drawing on the contexts of selected people in selected environments, the narrative is catalyzed as though an additional character has arrived.

Ethnography is also a rich source for creating and populating the narrative of a design fiction. For example, in Concept Kitchen 2025 the student's and participants' aversion to food waste highlighted an emotion centered benefit of just-in-time and on-demand delivery by drones. Stories of political and economic instability in the mobility project played a role in giving the background of self-sufficient adaptations in one of the

future worlds. This made the use of technology such as 3D printing self-evident, rather than the center of the narrative. The creation of the design fictions, telling the story of the world and why people behave the way they do, incidentally turned out to be a powerful tool for analysis. Rethinking patterns or contradictions as a person navigating them in that world helped sensemaking as much as identifying themes and experience mapping.

Speculative design practice and futures perspectives share the hope of provoking people to action. At the intersection of design fiction as a subgenre and applied ethnographic methods, comparing and contrasting individual reactions is a source of analysis and growth for the project. Lindley, J. et al. (2014) suggest studying the process, the audience, or the content of a design fiction. Following their suggestions, the team is part of the process of creating the design fiction. The audience includes other team members, research participants, and the client. During the Augmented Realities workshop, debate arose around whether replicating travel experiences for low income communities who otherwise couldn't afford to travel would alleviate or exacerbate inequality. How would status, such as the social capital of having travelled to an exotic locale, translate to a virtual experience of a place? Is travel or movement in general a right or benefit? Would proposing a virtual alternative treat a symptom, rather than a cause, of economic and social inequality? Would this technology act as an opiate in a future world? Depending on their own class, race, and gender background, participants debated each side. In a next iteration, the values drawn from the present context, could inform a more preferable design fiction. During the mobility project, the design fictions assumed a particular role for the client's product ecosystem. The narrative form allowed an exploration of the team members' personal and professional history: what did they consider the socioeconomic class of their audience in comparison to regional demographic figures? Was this who they wanted to reach in the future and why? The animated, story-based narrative of a future user created just enough distance between the current state and future directions for these conversations. By comparing and contrasting the reactions of different creators and viewers of the design fiction, the inconsistencies and contradictions among their present contexts emerge. Whether a design fiction seems inevitable, preposterous, or desirable in the viewers' eyes is as useful to a project team as the internal consistencies of the design fiction.

Design fictions encourage multiple viewpoints in their creation and interpretations. The openness of the form invites exploration and experimentation. In the projects above, teams co-created design fictions in the mobility project and the Concept Kitchen work. This required a consensus around what moments and themes were important to highlight in the worlds of each projects. The narrative form provides an alternative to analysis and synthesis methods such as pattern recognition, affinity mapping, and customer journeys. In the mobility project, having to write the narratives forced the team to consider what the most important elements were, what tone to take, and the background context such as social or economic signals. In the Concept Kitchen project, individual explorations by the students were a source of information for synthesis along with the primary research. The explorations revealed additional knowledge. For example, the Mindful Sink (Figure 3) offered different interactions to control intensity and temperature of faucet water flow. Design fictions used to illustrate multiple potential futures also provide a framework for analogous research done for inspiration, as well as multiple types of data like primary and secondary research and client documents. In applied settings such as product development, it can introduce branches in the design process. For example, self-sufficiency may mean a product that 3D

prints its own parts and books maintenance appointments in one world and one that locates gig jobs for the user based on location in another. Varying interpretations inform analysis and synthesis, including which design directions to pursue.

The intersection of design fiction and ethnographic methods has limitations, primarily around subjectivity and strategy. Because the design fictions emerge from the team's choices and fascinations, they are likely to include bias and assumptions that should be stated and accounted for during the interview and interpretation process. The design fictions should not be conflated with the strategy, rather the strategy emerges from the organization's negotiating amongst multiple potential futures (Stuart Candy, personal communication). Finally, participant and site selection must be refined so that participant's experience and expertise allows them to meaningfully absorb and react to the content of the design fiction. For example, if a narrative includes on the effects of AI the participant must be familiar with or prompted with additional content within or alongside the design fiction so they can respond to the positive, negative, and likely implications of the fiction.

CONCLUSION

Design fictions could become a ubiquitous research tool beyond provocations or high fidelity deliverables of a future vision. By definition fictional, their openness invites creation, interpretation, and discussion. Design fiction and ethnographic methods together can push and strengthen each other by creating a creative but rigorous scaffolding for interrogating expectations and reactions to the future. Design fiction can influence the activities, people, and places in which ethnography is done, and ethnography can create design fictions. While a design fiction depends on a self-contained world that makes the products, services, and interactions featured recede to allow a viewer's contemplation of that world, its connection to present context is relevant and useful for the applied design process. Drawing connections and comparisons between the context of the design fiction world and that of the creator, viewer, or participant allows ethnography to generate new knowledge and bridge the gap between interrogating the future from the present.

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