

Scenarios and Design: Scoping the dialogue spaces

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Abstract:

This paper discusses the intersections between two futures-oriented domains of practice and research: scenario planning and design. Both are practice-led, with uneasy but productive relationships with theorizing. Exploring their engagement offers ways to address challenges faced by interdisciplinary management research, which struggles to connect research and practice. The authors describe how they brought the two fields together. They outline how they convened, designed and facilitated the fourth Oxford Futures Forum held in May 2014. This brought together leading practitioners and researchers in a collective inquiry based on self-organizing, generative, reflexive making and dialogue. How participants engaged, from responding to the invitation to take part, as well as their practical and discursive encounters with one another during the event, threw up similarities and differences between the two fields. We present nine themes that capture the links and spaces between design and scenarios, yet suggest that they are not a straightforward overlap or a simple relationship, but rather a range of interactions between the fields, including feeding in, bridging, tension and repulsion. The paper's contribution is to suggest how scenario planning can engage with design, resulting in new opportunities for research and projects. These modes of engagement provide a framing to explore dialogues between other management disciplines.

I. Foundations of the Oxford Futures Forum: Engaged Scholarship, Transdisciplinarity, and Reflexive Practice

Scenarios and design are becoming increasingly important in business and public policy, shaping and influencing more and more development and strategy work. An analysis of the intersection between both is thus timely. This paper investigates the links and distinctions between scenarios and design, particularly as explored during the experiences and dialogues at the 2014 Oxford Futures Forum. The Oxford Futures Forum (OFF) is a triennial two-day meeting of practitioners and scholars geared towards nurturing new collaborations in research, practice, and education. Since 2005, the OFF (www.oxfordfuturesforum.org.uk) has sought to confront scholarship from different fields with scenario practice to advance scholarly understanding of why and how scenarios work. In doing so, it fosters the development of new joint projects, publications, exhibitions, events and other activities. In the 2014 OFF, the authors, as co-conveners the event, proposed exploring the new theoretical terrain opened up through focusing on design, a field that is becoming more theorized and also emerges from practice. From the outset, it is clear that the activities and artefacts within scenario work have all been designed, however, mostly with the designing itself remaining implicit. This Oxford Futures Forum sought to make these design choices much more explicit and understandable with the help of world-class designers and design scholars.

Leading with the field of scenario planning, we understand scenarios as structured conceptual systems of equally plausible future contexts, often presented as narrative descriptions and systems maps manufactured for someone and for a purpose, that serve as inputs for further work. Scenarios have been used for over sixty years in public and private work, and have always inhabited a practice-led field since their inception(s) in France with Gaston Berger (Bradfield et al 2005) and in the USA with Herman Kahn (Schnaars 1987). Scholars study these practices and help ascertain with theory which practices work well and why – and which fail, and why. Understanding how scenarios work has thus not been derived from social science theory - instead the practices of scenario planning have been an object of study by social sciences as well as the humanities.

Scholars have suggested that scenario work can be explained in terms of correcting decision-making biases (Schoemaker 1993); supporting more effective learning (de Geus 1988; van der Heijden 2005); changing Belbin team roles (Islei, Lockett, & Naudé 1999); informed by cultural theory (Inayatullah 2009); as social ecology in practice (Ramírez, Selsky, and van der Heijden 2010); and in building new social capital (Lang 2012). Schwartz (1996) and van der Heijden (2005) considered scenarios to be an art, not a science. Despite such diverse efforts, Wilkinson (2009) and Wright et al. (2012) both consider that the practice-led field of scenarios remains under-theorized. We subscribe to Kurt Lewin's view that good theory is 'good' if and in as much as it informs and improves practice, and have written this paper accordingly.

Design also is a practice-led field which has an uneasy relationship with theorizing. Three main research traditions have emerged. Scholars within engineering design have published formal theories and process models that describe designing, but are notable for the lack of agreement about fundamentals such as the object of design (LeMasson et al 2013). Researchers within art and design schools, influenced more by the humanities and by

contemporary art, have developed claims and some knowledge about how designing takes place and what designers do. Such traditions often emphasize the generativity and novelty of design and its orientation towards the speculative (e.g. Dunne and Raby 2013) but rarely attend to the wider discourses and contexts shaping design practice (Tonkinwise 2014a, 2014b). With the challenge of designing computer systems, two fields developed during the 1980s which brought social science perspectives to bear in two ways. Computer supported cooperative work (CSCW) and participatory design (PD) took on theorizing how designing takes place as well as exploring how such theories could shape the design of computer systems. These three traditions have expanded knowledge about design, but the field remains fragmented and heterogeneous in which scholarship is not closely linked to the unfolding of the practices that make it up.

The need then is to develop ways to fill in the space between theory and practice in both these practice led fields. Van de Ven (2007) in his influential book “Engaged Scholarship” explores management practice in particular but yields an interesting track into the dilemmas of merging design and scenarios practice, suggesting that what emerges is a dual challenge: Academics are exhorted to put their theories into practice, and managers seek to put their practice into theory. He suggested that social research is all too often not used for practice or science; that evidence-based practices are often not implemented, and citing Starbuck (2000) suggested that even within research take-up is scant, with papers in management journals average less than one (.82) citation per year.

Van de Ven (2007) seems to suggest that the bulk of management theory is derived from scholarly work – not from advances in practice. However, citing Boyer (1996: 15), he suggests that “Abundant evidence shows that both the civic and academic health of any culture is vitally enriched as scholars and practitioners speak and listen carefully to each other.” (p. 7). It is this co-listening that the principles and design of the Oxford Futures Forum seeks to obtain.

The OFF thus addresses some of the suggestions Van de Ven (2010: 8) offers. As we framed it in the OFF promotional material (call for papers, website, etc.), the gathering was configured to be a “form of inquiry where researchers involve others and leverage their different perspectives to learn about a problem domain.” The spaces for interaction designed for the meeting were meant to nurture relationships based on “negotiation, mutual respect, and collaboration to produce a learning community”. Both practice and scholarship were kept in play, focusing on “studying complex problems with and/or for practitioners” noticing that there are “many ways to practice engaged scholarship” and working to help “identify of how scholars view their relationships with their communities and their subject matter”. With these starting points, the OFF fought to balance Van de Ven’s dual challenge latent in the practice/scholarship divide.

However, the design of OFF intellectually predates Van de Ven’s work and is based on designs for inquiry established several decades before his work erupted in the Academy of Management. It builds specifically on the work of Eric Trist and his colleagues in the Tavistock Institute, particularly in terms of the “social engagement of social science” and on C. West Churchman’s (1972) now classic ‘Designing Inquiring Systems’. This fourth Forum, from which this paper stems, thus *continues* to pay specific attention to design, not only in its thematic focus on the relationship of design to scenarios but also in how the Forum itself

was orchestrated. As a summation of what was learned during OFF, this paper pursues the design principles and forms of engagement deployed in the OFF as a means to trigger movement between practice and theory, which in this case thematically look towards the intersection of design and scenarios.

Van de Ven's engaged scholarship claims that "you can increase the likelihood of advancing knowledge for science and profession by engaging with practitioners and other stakeholders" (2010: 9). However, Van de Ven restricts the role of 'design' only to designing the research itself, and does not extend a role for design to the building of theories, to the formulation of problems, nor to their solution. Following the pioneering work of Herbert Simon, he distinguishes research purposes from those seeking to design and intervene from those seeking to describe and explain. Yet in the OFF the links between scenarios and design are also pertinent for scholarship seeking to explain and describe – extending the scope of roles design (and scenarios) can hold in engaged scholarship.

Deriving useful theories based on practice-led inquiries can be seen as a move towards reaping the fruits of interdisciplinary mergers. Much ink and many pixels have been spilled on the value of transdisciplinarity as a means to generate fresh ideas and ignite usefully unusual concoctions. Marrying two related but divergent schools of thought reinvigorate the scholarly landscape (Barry et al 2008). Yet when the disciplines are practice-led, the challenges of fruitful collisions and mutual learning are multiplied. A key conundrum is how to unearth new, salient research areas from the mixing of two complementary fields. According to Sandberg and Alvesson (2011), who investigated the issue in organization studies, a normal tactic involves looking to the literature to spot "gaps". However, they note that this dominant method regularly fails to challenge the assumptions that underlie existing literature and suggest that it is far more revealing to construct new theories from questioning assumptions, instead of just filling in "gaps". In looking towards the intersections of design and scenarios, we propose that a method for detecting worthwhile research areas, especially in practice-led fields, to create confrontations between scholars and practitioners in two fields in an intensive, designed, live experience.

OFF is thus also a forum that lives up to Donald Schön's work on reflective practice, where the practices of scenarios and designers can be critically assessed by scholars of scenarios and design, ideally together and if not of each other's work. By bringing in design as a core theme in 2014, we asked that scenarios practitioners and scholars design what they were imagining before they could or would describe this (as designers do); and we asked the designers to be more articulate in describing -not only- their designs rather than letting them "talk for themselves"; but also to consider the future contexts these designs might inhabit – as scenario planners would expect them to do. This, as this volume of papers illustrates, proved to be a very fertile and powerful catalyst for learning, insight, and experimentation – for designing better scenario work and for using scenarios to enhance the effectiveness and interest of design.

This article suggests spaces where the field of scenarios and design currently interact and can potentially interact further. We capitalize on the design of the Oxford Futures Forum as a methodological approach for investigating hypothesized spaces and revealing other areas of inquiry in light of the actual exchanges at the Forum. Certainly, most of the spaces we map are overlapping, intersecting or synthesizing the scenarios and design fields. However, based

on the exchanges in the Forum, we note in the section on further research (VI.) that what evolved during the Forum was not a simple merger, or straightforward overlap of design and scenarios, but rather a range of different kinds of interactions between the fields, including some healthy repulsion. Finally, as part of the overall agenda of this special issue, we encourage for the continuation of more and more diverse interactions between scenarios and design communities of practice and research by both cultivating opportunities for further study of the spaces we have identified, as well as extending into spaces we neglected or have been unable to surface.

II. Engagement at the 2014 Oxford Futures Forum

This section of our paper explores the design of the Forum itself, as the method deployed in this dialogue, we believe, represents a worthwhile approach to surfacing new connections between two fields led by practice. On 30–31 May 2014, 70 invited participants working in academia, consultancy, design, government, business and the arts joined together in an open space format intended to support rigorous and practical reflection, as well as methodological invention in both fields. We built upon the inquiry designs developed in the three prior Forums (scenarios and social ecology in 2005, scenarios and sensemaking in 2008, and scenarios and complexity in 2011). The Forum's design is self-consciously interactive and participative, with the substance created and evolved by the participants themselves. However, the 2014 event differed, as we shall explain shortly, in terms of moving away from a unique focus on dialogue by also including a bespoke designed space wherein the hands-on making and the construction of artefacts, performances, images and interactive experiences took place. These approaches in the design of the event were shaped by traditions from the field of Participatory Design (eg Simonsen and Robertson 2012; Sanders, Brandt and Binder 2010).

In considering how to set up an engagement, we were guided by the aim for productive encounters with tangible self-organised outcomes such as publications, projects, and collaborations. In line with the previous three Forums, an aim of the 2014 event focused on scenarios and design Forum was to forge and support an international community of future-minded scholars and practitioners. The event itself designed to stimulate the generation of actionable, impactful knowledge by identifying and investigating academic and practitioner interests at the forefront of scenarios and design, and relating them to each other.

In this way, the design of the participants' experiences at the Forum sought to uncover and push the boundaries of scenarios and designs practices and theory, and to clarify and extend their effectiveness through critical review and transdisciplinary cross-fertilization. By enabling new connections and distinctions, we intended the event to yield productive networking and knowledge creation opportunities, as has been the case in prior Fora (e.g. two books from first OFF in 2005; a set of sense-making scenarios and two published papers after OFF 2008, which saw another workshop based on the Oxford one organised by Arizona State University; so far one paper from OFF 2011). Our hope was that by leveraging the neutral, respected and international convening power of Oxford University, the Forum would succeed in its purpose of facilitating the generation of novel ideas and thereby help to set the foundation for new collaborations.

With those outcomes in mind, we worked to operationalize the principles of engaged scholarship, transdisciplinarity and reflexive practice to investigate these continually developing fields. Engagement at the Forum was shaped through a deliberate and emergent design conceived by us as co-conveners. As detailed below, we designed engagement by adapting traditional conference practices to include novel approaches including: short-listing idea abstracts, sharing images in advance on Flickr, integrating designed artefacts in a professionally curated exhibition, hosting iterative rounds of dialogue convened independently by participants and facilitated by student note-takers, and using social media before, during and after the event.

The 2014 OFF first solicited 250 word abstracts from an invited group of 980 scholars and practitioners working with design and scenarios.¹ The 83 submitted abstracts were reviewed with an eye towards how well the ideas (1) explicitly related scenarios and design to each other; (2) offered an innovative approach or theory; (3) displayed originality in scholarship and/or practice; (4) demonstrated reflexivity or a critical assessment of one's work; and (5) offered clarity. These criteria enabled the organizers to provide initial feedback and peer review on the ideas prior to issuing acceptances to the Forum. Importantly, since the Forum was designed not as an opportunity to present formal academic papers (as would occur at traditional academic conferences) but instead was designed to foster self-organized, generative conversation and making, we asked participants to think in advance about their contribution and what they hoped to explore during the event. Their concise abstracts signaled that the psychological contract, as well as the professional arrangement, was one of participation and contribution – not one of passivity. Knowledge that these abstracts would be publically shared on the OFF website also lent an air of seriousness to the effort.

In addition to the abstracts, we also requested the submission of an image of a designed artefact or event, which we uploaded to a public Flickr web archive. The first reason was to foreground early on that in this Forum, we would highlight and acknowledge the symbolic and material qualities of artefacts associated with scenarios and design. The second reason was to use these visuals as part of our collective inquiry. Prior to the Forum, we also asked participants to fill in key words for nametags (“Ask me about...”) to encourage mingling. Towards this, we also, staged the plenary room with posters of headshots and bios thus creating an opportunity for ambient introductions so as to increase likelihood of informal exchanges.

Also, keeping with the need to move beyond dialogue when exploring practices of design, we felt it important to display exemplars linking scenarios and design in a small exhibit. The exhibit, *Future Things*, curated by authors Kimbell and Selin and assisted by Kerri-Anne Chisholm, showcased ten pieces in order to trigger and deepen the dialogues at the OFF, and to draw attention to the importance of materiality, imagery and experience at the intersection of design and scenarios work (see Figure 1). We asked participants to submit original materials that showed how design work engages with scenarios, and how scenarios work engages with design. Similar to the selection of abstracts, we asked potential exhibitors

¹ The list of invitees were guided by the criteria of whom we considered to be “leading practitioners and researchers who are working productively in both fields and at their intersection” (2013; p.2). The list was drawn from personal contacts of organizers, recommendations from established scholars and practitioners, and participants of previous Oxford Futures Forums, and alumnae from both the Oxford Scenarios Programme and the Consulting and Coaching for Change Programme at the Saïd Business School.

to send an image and a one page description that covered when, where, how and why the artifact was created, and how people engaged with it. We selected those artefacts that we believed raised some of the tensions and opportunities in the encounters between design and scenarios. The main audience for the exhibit was the approximately 70 people attending OFF, as well as other visitors to the Saïd Business School Egrove Park building in Oxford.

Together the artefacts presented a range of posters, objects and digital materials that capture some of the different ways that futures are materialised in scenarios and design practice. Calling them “future things” emphasized how their “object-ness” is tied up with the practices of commissioners, creators and users of scenarios and designs. Drawing on design theorists using the term “thing” (Binder et al 2011; Latour and Weibel 2005), the title of the exhibition recognized the irony of de-contextualising objects from their contexts of production and engagement. Captured in an exhibition, many of the objects were severed from the practices they were part of, although some of the works – notably Ilona Gaynor’s “Paper Moon” – are native inhabitants of exhibitions.



Figure 1 Installation shot showing OFF 2014 participants engaging with one another within the “Future Things” exhibition at Egrove Park, May 2014 (Photo Kerri-Anne Chisholm)

From the outset, curating the exhibition required thinking about how these future things could make sense within the wider Forum. We designed the event to stage the exhibition not just as a curiosity to look at with a glass of wine or cup of tea in your hand, but rather as an

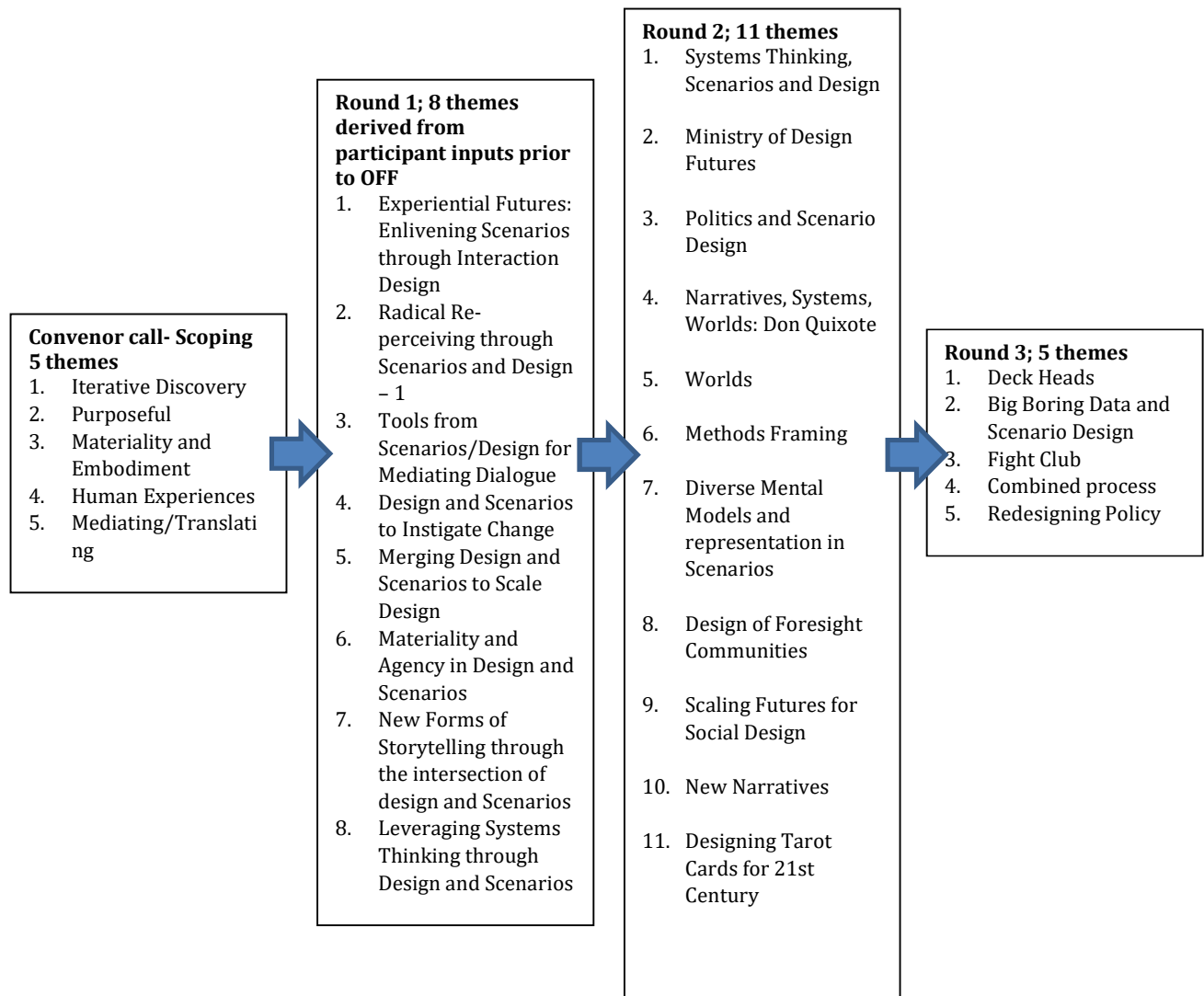
integrated element of the investigations it was set up to carry out. As curators having done this before in other ways², we knew how tricky it is to bring the artefacts as participants in their own right into the dialogues human participants hold. For the OFF, we staged the encounters within the Forum by having participants tour the show in the company of one of the people showing their own work in it, as part of the opening round of introductions. This equalized the people who had sent in abstracts or position papers and those who had exhibited works. Asking all the participants to tour the exhibition in their first round groups, and engage with artefacts in the collection in one another's company, showed that we, at least, wanted the objects to be active participants in the Forum.

The Forum consisted of three rounds of dialogue and differed in many ways from the standard conference design of sequential 'stand and deliver' speeches. The set of initial topics were determined by the organisers based upon an analysis of the selected pre-forum inputs submitted by participants, and as described, included a visit to "Future Things". The next rounds of dialogue were generated through an "ideas market" fashioned as a self-organised, emergent bazaar, where participants were invited to write their topic on a board and collect others interested in the topic. In this way, beyond the initial discussions, the participants collectively generated subsequent topics during the event. After each round, participants relayed their key insights in creative formats from theatrical performances to live game play. For the third round of dialogue, we set up a studio space, with assorted materials (arts and crafts supplies, papers, foam board, etc.) for prototyping ideas and generating material artefacts to support the making of a tangible representation of the dialogue topic.

As has been the practice in previous Forums, note-takers were available to the breakout groups, and a summary report of the Forum's generative dialogues were published on the OFF website (www.oxfordfuturesforum.org.uk). A new addition this time to the documentation of the event was the work of professional and volunteer graphic illustrator Matthias Augustin who captured the different groupings within each round in a visual format. Lastly, to encourage another level of interaction and documentation, we set up a Twitter hashtag (#OxFF2014) that provided an alternative channel for dialogue between people who were tweeting while participating. This enabled participants who were part of the OFF to engage in near real-time with one another via Twitter and with others who were not present.

During pre-forum call for abstracts, we the conveners scoped five themes as useful starting points for triggering generative and iterative dialogue. Table 1 shows how the five initial spaces evolved from analyses of abstracts into the first round of eight themes, then to the second round eleven groups (derived from the 'ideas market'), and filtering down yet again to the third round's five themes. As aforementioned, the expansion from eight initial themes into eleven themes in the second round and eventual contraction into five themes in the third and final round was not orchestrated by us but emerged collectively through the open space interaction at the Forum, and thus, we believe, marks an authentic pursuit of what's currently interesting about the intersections between scenarios and design.

² For example, Selin co-convened the *Emerge 2012* conference and exhibition at Arizona State University (Selin (2014) <http://emerge-dev.asu.edu/>) and Kimbell co-curated *Imagining Business* in 2008 at Oxford. (http://www.lucykimbell.com/stuff/Imagining_business_intro.pdf).

Table 1: Rounds of generic dialogue

III. Findings: Intersections Between Scenarios and Design

At first glance, from the perspective of design research and practice, the intersection with scenarios is uncontentious. Even if designing an object, a designer is designing for future use, perhaps with a specific user in mind. How she grasps the object, where she encounters it, the practices it becomes part of or shapes, what new possibilities it affords or others that it disrupts - these are all already implicated in the work of designing and in the user's own (re)designing in use. A designer designs things for present as well as future situations, and if paying attention to the context of the design, would consider scenarios as a plausible set of contextual conditions of these situations. As in practice these future situations unfold, scenarios step in to help explore how they may depart from how any design team imagined

things would play out. In this way, designers and scenarists are in the same situation, and can use scenarios in comparable ways.

Also from the perspective of scenarios scholarship and practice, scenario sets render explicit the assumptions a design and/or a designer have made of the future context their design is expected to inhabit. They ascertain if alternative plausible contexts need to be considered to ensure the design works as intended.

But the encounter between scenarios and design envisaged in the Oxford Futures Forum went beyond these aspects. It did so by bringing together - we believe for the first time - the leading practitioners and researchers who are working productively in both fields and at their intersection. The intersections comprise the territory where people with design backgrounds are involved in creating future objects for the uses and practices they aim to provoke, amplify or disrupt, where designers surface and render explicit, palpable and tangible and examinable relevant assumptions and differences of understanding or worldview - or even underlying myth, as Inyatullyah (2009) has invited us to surface. This is also the territory where people working with scenarios pay attention to the material, embodied, aesthetic and affective dimensions of their work (Davies et al 2012); where they render explicit the choices they make in deciding how to convene and run workshops, engage stakeholders, render their work understandable, and ensure their scenarios are used and communicated effectively.

Both scenario planners and designers build up and immerse those they work with in potential futures. Each has and can offer unique approaches, views, ideas, and tools to assess an uncertain, unforecastable, messy or wicked or problematic situation. Each regularly sets the stage for courageous conversations, experiments, and even transformation. There is often in this work a shared focus on sustainability and socio-cultural change, bound by intention and fueled by careful study.

Nine Intersections of Scenarios and Design:

We now hone in on nine intersections between scenarios and design culled from a macro analysis of the OFF's rounds of dialogue and assorted engagements. The first five are loosely derived from some of the initial themes proposed by us as conveners, though they are significantly augmented from the conversations and making emanating from the OFF. The additional four themes are a consolidation of what we see are the most salient themes arising from the OFF, suggesting new pathways for engaged scholarship into design and scenarios.

1. Iterative Discovery

In this Oxford Futures Forum scenario and design practices were both understood as iterative processes. Scenario planners build scenarios to help users to rehearse alternative futures and these scenarios are defined and built through a process of co-inquiry that involves multiple phases of research, peer-review, and reflection. Often starting with a review of the users' value creation and the strategic challenges they face, scenario work carries out disciplined imagination of contextual factors shaping uncertainties in the macro environment. The unwieldiness of wildly dispersed factors is then structured in frameworks that enable comparison, even contrast, and understanding between stories. In producing

scenario system diagrams and stories, stakeholders are identified and engaged with, trends and their (un)sustainability are defined and assessed; ideas are rendered, tested, disposed of, and resurrected; and in doing this, clarity and improved intelligibility is manufactured. Ambassador Lam of Singapore (personal communication) called scenarios “bamboo scaffolding” as they are adaptable and temporary (and often disposable) supports for beginning difficult, courageous strategic conversations yielding insight that reframe understanding (Normann 2001), helping to surface new propositions or questions.

Designers have been described as exhibiting divergent and convergent thinking (Buxton 2007), and as opening up and closing down possibilities during their work (Binder et al 2011). Whether “design thinking” is understood as an organizational learning journey (Beckman and Barry 2007), or as a cognitive style (Cross 2006), like scenarios, design practice can be seen to unfold through repeated collaborative cycles of exploration and inspiration, framing and reframing, idea generation, and prototyping. Socio-cultural traditions of design research recognize designing as never unfinished, since it is not the designer’s intent that determines the meaning and outcome of a design, but its integration or otherwise into future practices.

Iterative discovery then evokes the multiple phasic nature of both design and scenario processes, suggesting that both are process-led approaches. During the 2014 Forum one breakout group investigated the phases of discovery that come to bear on both design scenario processes. Sharing terminology and approaches, participants outlined the phases of the development process, highlighting the similarities and differences between a scenarios approach and a design-based approach. For example designers iteratively generate solutions as a way of exploring problem spaces. While they did not come to consensus on a straight overlap between design and scenario processes, their inquiries unpacked some of the intricacies and affinities between the two, and suggested signposts for further research and practical experimentation.

2. Materiality and Embodiment

Again, design’s historical focus on materiality might be seen to be distinct from the conceptual nature of scenarios work. Indeed, a core practice within design is giving tangible form to concepts as a way of manifesting, developing and exploring them. Designers regularly make mock-ups and prototypes to make otherwise vague things concrete (Selin & Boradkar 2010), to help things that have not taken place to become real. On the other hand, the use of scenarios very often is centered on the discursive, or else relatively flat media such as paper, slide decks, screens or wall displays.

Yet again the focus on materiality is richer still. For instance, to instigate organizational change, many organization or interaction designers start with (re)designing spaces, changing or moving furniture, or otherwise disrupting what might otherwise be or remain as “normal” work flows. Along the same vein, the ‘strategy as practice’ research mode (SAP 2010) studies how scenario planning practices such as room set-ups, the use of tools such as white boards, hexagons, post-its, or software support and transform perceptions and conceptions. Hodgkinson and Healy (2008) have assessed such choices in their scholarship on scenario processes design options.

Materiality matters up front and in mundane ways, but how and why it does for scenarios and design (and their intersection) is not clear. What's understood is that the conceptual and the material are interlinked. Interactions with artefacts such as sketches or models can open up new conceptual territory for organizational teams. Design teams focusing on future technologies typically make films to explore and communicate (or 'render') the future interactions people might have with technological objects they design (Kimbell 2014). In the paper to convene the 2014 OFF (Bhatti et al 2013), we used as an example BERG London's film about Nearness (BERG 2014), which set up a playful set of encounters between material and digital artefacts, and by doing so, posed questions about the intimacy of human-computer interaction. In such films, or mock-ups, the materials "speak back" (Schön 1983) when looked at – they don't only passively communicate what a designer intends.

This focus on materiality, native to design, has recently begun to seep into scenario practice and scholarship (Candy 2010; Byrne et al 2012). For instance, the "Emerge" event convened at Arizona State University focused on the rapid prototyping of design fictions, mobilizing hundreds of people over several days to build, visualize and enact alternative futures (Selin 2015). More than moving around the furniture, Emerge sought to build speculative designs to prompt ethical reflection. Similarly, Candy's work (2010) seeks to create embodied experiences of and with the future in order to enable users to reflect differently than one would with two dimensional, or discursive representations of the future.

Participants during the 2014 Forum found that enlivening scenario work with materiality in mind, producing theatre plays, newspaper articles, advertisements, street signs, or product packaging, helps to convey futures more powerfully. Using everyday artifacts as scenarios represents differences between the present and future in a cultural language people can readily engage with. **For example**, a cereal box from 2040 claiming that the cultivation of its ingredients results in a net removal of CO₂ from the atmosphere might be used to express a future world deeply dealing with the issue of greenhouse gas reductions. These so-called "Artifacts From the Future", popularized in *Wired* magazine, hack existing products, services or media to create "mediated scenarios" (Selin 2014).

For instance, one 2014 OFF breakout group experimented with a faux magazine cover (Figure 2) and the performance of a fashion show to explore their innovative thinking about the future of governance. Drawing on scenario thinking and design practices, the group presented future (and present) politicians as fashion models on a catwalk to emphasize the ties between voting and consumption: as voters we are making choices based on the signifiers attached to the politician. The group developed a magazine cover featuring a headline story about "Tailoring Voting" to spark a debate about the ways in which politics is already a form of consumption, wedded more to fashion trends than to substantive debate. As an emerging area of practice, scholarship that makes sense of materiality and embodiment relevant to the intersection of design and scenarios is lagging.

Figure 2: Tailoring Voting



3. Human Experiences

Over the past two decades, professional design has shifted explicitly towards designing experiences. Contemporary design fields focus on the design of interactions and services, not just new artefacts, often aiming to change behaviours - whether they are explicit about this or not. Singleton (2012) went as far as saying that design should reclaim, as part of its DNA, “metis” – a Greek term denoting a form of cunning, which then surfaces concerns about the trickery and plots of design and how it informs human experiences. Whatever the politics and ethics of professional design’s expertise, the take-up of ethnographic research which seeks to track and evidence lived human experience is on the rise within design, innovation, and new product development. Evidenced in communities such as the annual Ethnographic Practice in Industry Conference (EPIC 2014), this rise was taken by we conveners as a manifestation of increased rigour by designers in their thinking through why and how human experience can be explored, represented and intervened into.

When scenario practices explicitly consider human experience, attention often hones in on individual experience as well as group dynamics in workshop settings. This attention concerns being aware of different kinds of participation, of power relations, of the politics of who participates, and of the social psychology of the settings in which scenario work is conducted (Bradfield 2008). Lang (2012) extended that thinking by exploring how scenarios might more richly connect oneself to a new set of other human beings and build new communities.

The 2014 OFF invited richer explorations of emerging forms of scenario practices which seek to create more intimate, human-centered senses of time travel, perhaps luring scenario builders and users to get a refreshed sense of the everyday while also highlighting sensual features of an alternative world, as Radford (2012) proposed with “experiential scenarios”. A particularly thought-provoking presentation by one of the OFF breakout groups that epitomized the intersection of design and scenarios in relation to human experiences was a pre-enactment of the 2025 OFF meeting, centered on the failures of the community.

During a presentation that was staged with constant disruptions throughout with flickering lights and unexpected noises, the presenters painted a picture of high volatility and unrelenting change that outstripped the OFF communities' ability to organize well. Thus by embodying the change through disruption, they gave a more visceral sense of the new reality, an experience for the audiences of disjointed thoughts and frustration. This theme suggests more focused attention of the lived human experience of alternative futures, and the various means through which scenarios and design can enliven them.

4. Purposefulness

The 2014 Forum understood both effective scenarios and good design to rely on a strong guiding purpose. Both were considered to aim at a deeper understanding of how they can help the users or clients to create value. As conveners of the Forum we appreciated that at their core, scenarios and design disciplines both have in common the intent behind Herbert Simon's definition of design as a science of the artificial, as "devising courses of action aimed at changing existing situations into preferred ones" (1996: 111). Influenced by researchers/designers working within Scandinavian Participatory Design traditions and workplace studies (eg Suchman 2003), design is also—as was understood in the 2014 Oxford Futures Forum—about collective action, rather than only a matter of individual skill. Design is also constituted by the activity of wider groups of actors.

Scenarios as understood in the OFF are a set of possible future contexts, designed and specifically manufactured for someone for a purpose and with an intended use. In scenario planning, the future is taken as a conceptual category that allows unique though plural perspectives on the present enabling new pathways of action to emerge. Thus producing scenarios to –say- 2040 does not suggest they will be used in 2039; instead it proposes that looking at the present (and nearer term future) from the perspective of 2040 is helpful. Part of the help so obtained is to contrast at least two and not more than four such perspectives with each other – as well as with those used in the present by the users.

In the Oxford school of scenario planning, we contrast strategy (what one intends to do) with scenarios (possible future homes of those intentions, especially once implemented). It is in this surfacing and contesting of assumptions about the future context—the contexts one's intentions might inhabit—that scenario purposefully supports strategic decision-making. Scenarios can also be used for other purposes, such as assessing values in dispute, as was the case in prior OFF events that focused on sensemaking (OFF 2008) and appreciating complex situations (OFF 2011), but at heart the intended purpose of scenarios takes center stage. In the 2014 Forum, participants relayed experiences with, or conceptions of, new purposes. Some ideas for shared purpose between scenarios and design included keeping critique alive, politicizing futures we are force-fed, feral coaching, and the possibility of constructively ambushing the client with "scary futures". These and other joint purposes should be further tilled.

5. Translating Differences

The sociology of translation (Czarniawska and Joerges 1996; Mueller and Whittle 2011) studies how concepts from one realm are made interesting to and then enrolled and taken up by someone into another realm. Scenario sets designed and framed as structured imaginations can be rendered communicable and memorable through the use of stories,

pictures, performance, props, films, and other artefacts to be shared. It is because they are designed as sets that scenarios allow differences of opinion to be shared, mapped and compared. Along these lines, scenarios have been conceived as designed boundary objects that can help individuals and teams to hold multiple and even contradictory meanings or views simultaneously (Selin 2006) thus making disagreement an asset in developmental ways that avoid regression (Winnicott 1960).

In the design field, Henderson (1999) showed how important visual representations can be for collaboration in teams of engineering designers. From another vantage point, Carlile (2002) demonstrated how knowledge is transformed through creating visual boundary objects. Such research from both fields on translating differences has not extended, to our knowledge, into how designers and scenario practitioners work yet suggests a ripe avenue for further research.

Many of the scenario planners and designers who the 2014 OFF brought together trade in nuanced approaches to capture, manifest, share, render, and communicate unusual, contrarian, and even difficult ideas - and devise inspirational innovations to make them accessible to participants or users. They seek to mobilise and use and enhance creativity. Moreover, both scenarios and design in this OFF sought to translate the imagined 'then and there' with the actual 'here and now'. Both seek to help people in their assimilating and translating complex imagined possibilities into action.

Yet this translation is not always straightforward or without hidden politics. One OFF breakout group developed a "Crit Kit", a series of prompts to review scenarios that could be used to interrogate the assumptions and politics latent in representations of the future. The Crit Kit featured suggestions for critical questions and tags to probe the often-implicit factors that can give rise to one future over another. For instance, glossed over in many design fictions or scenario narratives are religious or political values, a revision of gender roles, the material intensity of a given product, corruption and crime, or attention to technological failure or waste. The Kit would be used enable a surfacing of such political and ethical entanglements and invite these to be scoped back explicitly into the work. Behind the simple Kit were deeper reflections about how the future is co-constructed, often by a certain class of people, thus raising questions which Inyatullah (op cit.) and others have included in their 'critical futures' work such as: who gets to say what constitutes utopia or dystopia? Which values are unwittingly built into these visions? Who is being excluded from the conversation? Bundled up in the Kit were these studied reflections on agency and authority that while not made overt, were made obvious enough through a tried a true design practice of critique, thus uncovering what is often subtly translated in a representation of the future.

6. Re-perceiving: Making Familiar Things Strange

Schön's (1989) emphasis on framing and making moves (or taking action) during professional work, drawn in part from observing an architect teaching a student, has been absorbed into design research. Framing and reframing is now understood as a core characteristic of designer (eg Cross 2008; Lawson and Dorst 2009) and in design practice, the activity of looking at things differently is recognised as a distinctive attribute of what designers do. For example designer Alan Fletcher's *The Art of Looking Sideways* (2001) is a

compendium of the visual design of material artefacts which occasion confusion and simplicity, engagement and reflection, surprise and serendipity.

Because they are situated in the conceptual future and offer broader perspectives than present viewpoints offer, scenarios were thought of in this OFF as designs which invite perspective shifts, and which, when they are successful, manage to avoid the constraints of present politics and past left-overs. Normann (2001) said building scenarios was like building oneself a crane that affords an otherwise impossible point of view and whose hook allows one to come down to earth and compare the view with the here and now reality.

One breakout group explicitly focused on re-perceiving as a topic. Here links and contrasts between the individual to the collective evoked inquiry into how we might stand outside the barriers of our own understanding and experiential constructs. Ramia Mazé proposed the concept of “supervalence” as a pivot point from which we could step outside of our time and space to perceive differently. Here “‘the future’ is not a destination that might be defined and reached with the right methods, but a “supervalence” (Grosz 1999), an outside to an experienced present (Maze 2014). The exploration also focused on how to manage different cultures and different timeframes, as well as different value systems, for instance between technology optimists and dissenters. What is clear is that the role and capacity of design and scenarios to evoke re-perception has been an ongoing theme in both literatures, and continues as an enduring theme of interest.

7. Systems Thinking

Often considered to be primarily concerned with material artefacts, design is a field of practice which has so far wrestled, often uneasily, with system levels and alternative contexts (Systemic Design 2014). Professional design’s origins in craft and designing for industrial manufacturing in which the business model is designed by others, means that many designers are attentive to human encounters with artefacts, ignoring the systems they are part of. However, newer design professions have shifted towards systems thinking. When so-called user-centred design emerged in the 1980s, it expanded the ontologies of design by introducing the concepts of “user” and “task”, adding to the existing entities of “designer” and “object”. Such expansions do not come without a cost, though. The application of design to interactions, experiences, services, systems, behaviours and policies over the past 15 years make it less clear where design’s core expertise lies. Such issues raise questions such as how designers might continue to have responsibility for material and digital “stuff” while also needing to engage with and design for wider contexts and the impossibility of designing complex systems. To our knowledge, such issues on the future of the design profession have not yet been engaged extensively with the help of scenarios, while other professions such as gastroenterologists³ have done so for their own work.

In contrast, scenarios have used systems thinking extensively, and arguably from their very beginning, with RAND having been an early adopter and promoter of the approach. This is not to say that the issues involved have all been sorted. On the contrary, as we write this paper in November 2014, doctoral dissertations are still being produced on this complicated

³ See <http://www.ueg.eu/research/gi2040/> accessed November 2014

relationship⁴. Systems are important for scenarios (as well as for design) because they get us to link factors together in plausibly logical or understandable patterns. These links tend to be a-temporal. If the links are temporal (see 9. below), playing over time, they become stories, while the factors linked in stories become events. Stories and systems complement each other in establishing plausibility (Ramirez and Selin, 2014), which is what bounds the imagination disciplined scenarios channel, depend on, and upon which their usefulness rests.

At the forum, some participants coalesced around the theme “Leveraging Systems Thinking through Design and Scenarios”. They looked into the challenge of systems thinking whereby a process abstracts and sacrifices information for greater understanding, particularly as scale and scope increases. Participants delving into systems thinking seemed to agree that data of the past is becoming less relevant for future predictions and the future is becoming more uncertain. Both scenarios and design can help engage greater number of multiple stakeholders for both framing the problem through experience (rather than reliance on data) as well as designing solutions through iteration and experimentation. With careful use of scenarios and design, the group deemed the combined approaches would enable systems to have the necessary capabilities to manage uncertainty in perceived reality and adaptability to scaling up of solutions.

8. Enabling Multiple Interpretations

Both designing and scenario planning deliberately open up opportunities for multiple interpretations. At the same time, the practices of scenario planning and design also strive to simplify and reduce. For instance, a 2x2 scenarios framework, common in the deductive school of scenario planning, orders the complexity and messiness of practice. Alternatively, from design, a sketch or a user persona foregrounds one perspective and removes other detail. Some of the artefacts in the OFF exhibition illustrated this well. For example, the many elements of the “Paper Moon” installation, from small figurines and models to printed documents and photographs to a modified laser printer to a piece of cake and knife, offered numerous routes into engaging with the work. Their diversity seemed purposefully to provoke multiple aesthetic responses and resist a singular interpretation. Similarly a participatory design game by the Danish cross-ministerial innovation unit MindLab featured in “Future Things”, included several simple objects made of card, foamboard and wood, and offered the teachers at whom it was aimed diverse opportunities to explore concepts related to a new educational policy. At the heart of these exhibits were opportunities to offer lenses from which to derive multiple interpretations.

In the Oxford school of scenarios, this staging of an opportunity to derive multiple interpretations is key. Scenarios are considered as windows into different contextualized futures, as an invitation to try on other perspectives on the situation. Key to the practice, from the early days at Royal Dutch Shell, was a focus on mental models. As Pierre Wack, an early and highly influential innovator of the method suggests:

In times of rapid change and increased complexity, however, the manager's mental model becomes a dangerously mixed bag: rich detail and understanding can coexist

⁴ cf. <http://hull.academia.edu/AnthonyHodgson>

with dubious assumptions, selective inattention to alternative ways of interpreting evidence, and illusory projections. In these times, the scenario approach has leverage and can make a difference. (Wack 1985; 150)

One exercise that was staged by OFF participants was a game that revolved around the multiple mental models associated with contrasting perceptions of climate change. The breakout group working on this proposed different point of views e.g. “Technology can save us”, “We are all doomed”, “It’s impossible to know”. The wider set of all OFF participants were asked to get up from their seats and stand with others sharing that view. The point of this exercise was that these ideas don’t fall along a simple polarization, but rather show up in multiple dimensions, leading to more questions about how register solutions that take into account different mental models.

9. Narratives

For both design and scenarios, narrative is central. One of the observations that emerged from the OFF was the rich variety of ways with which narrative can be created and deployed within design and scenarios.

For designers, a “scenario” is usually understood as a story about a person engaging with a product or service in their day-to-day life. Such design views are grounded in empirical or fictional detail attentive to what goes on now as well as what could go on in the future, in the interactions between people and things. Techniques used in contemporary design practice include creating storyboards and videos that tell a story about someone’s future experience, and the key touch points involved as they engage with an organizational offering or service.

For scenario planners, stories are considered the best way of engaging the imagination with plausible futures. Ramirez (2010) analysed how novels and fiction inform the way scenario stories work to render them effective. Burnam-Fink (2014) and others have explored the connections between science fiction and scenarios. Stories make the imagined unsayable (in the present) communicable; and good stories in our minds become more vivid often than our immediate actual reality. Discussions at the OFF suggested that better designed stories would make scenarios more effective, rendering the investments that manufacturing and using them involves more attractive.

More than that, however, was focus on “new narratives”. Recognizing the narrative is a cornerstone of human sense making, and that the human condition is rapidly changing (in light of information technology, globalization, climate change, medical enhancements, etc.) new myths are and should be created to orient us. OFF participants explored how the form of story is changing with rises in transmedia and new tools. Yet one compelling instantiation of narrative played within the OFF was the creation of a new set of tarot cards that could be used for scenario development. These cards, generated by a group of designers and scenarists experiment using card decks as props in their work, were conceived as producing “metanarratives”, thus harkening back to the ancient way that tarots have been used as a starting point of a story for centuries. What is suggested here, for both designers and

scenarists, is to experiment more with new forms of stories, but also to continue to renovate the power of story to unfold new realities.

IV. New Spaces Between Design and Scenarios: Further Opportunities for Research

As stated earlier, we designed the Forum as a means to generate new ideas at the intersection of scenarios and design. Upon reflection, less than a year after the event, we realize that exploring design and scenarios is more than just seeing the intersecting parts. Of interest too are the multiple ways that the two entities can collide. Transdisciplinarity is more than the straightforward cross-over between two disciplines and mining new territories offers a more nuanced look at both design and scenarios.

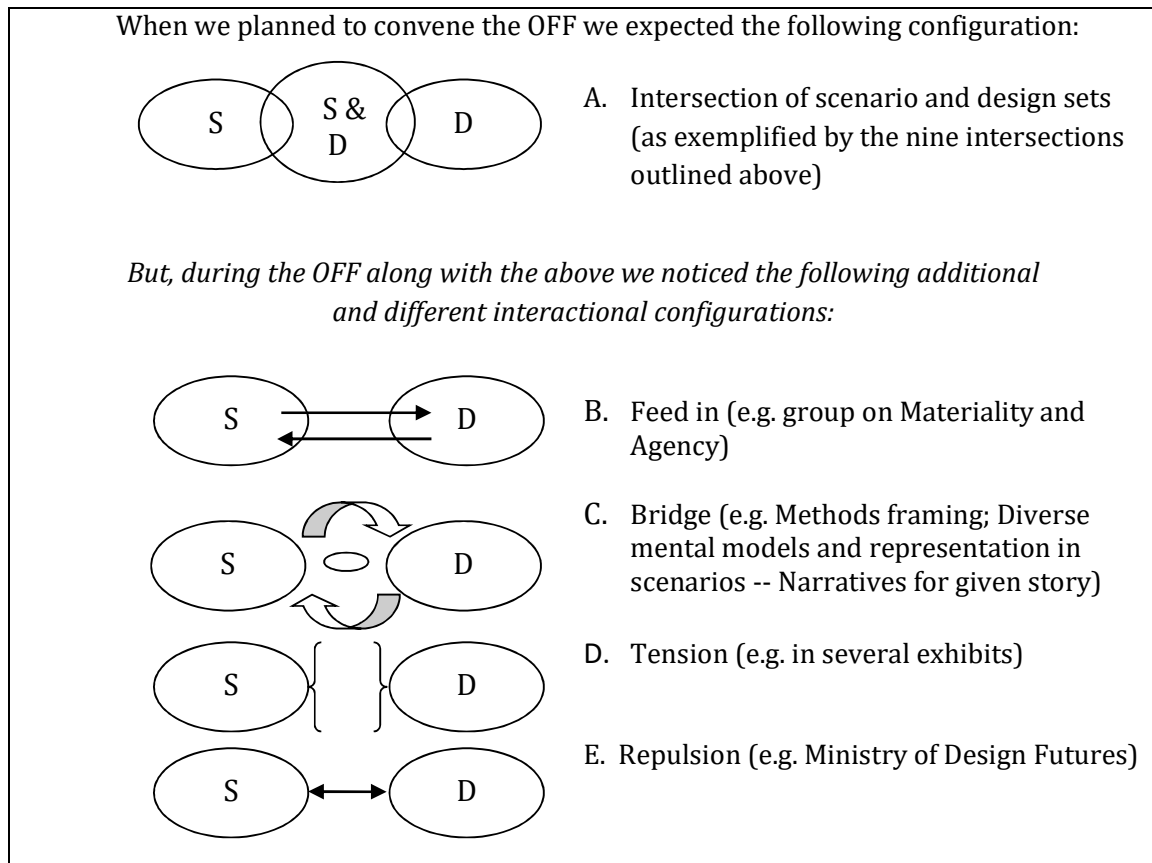
In studying three fields characterized by interdisciplinarity across natural sciences or engineering and social science or arts, Barry et al (2008) question the idea that inter or transdisciplinarity is marked simply by synthesis between disciplines. They instead argue that the pursuit of inter- or transdisciplinarity is marked by both agonism and antagonism to which they offer different modes or logics of interaction. Similarly in retrospect, we as conveners note that spaces of opportunity revealed during the OFF ranged from semi-merging and intersectionality on the one extreme to repulsion at the other extreme. That is, there are a number of different ways to think about the architecture of interaction that occurs between different disciplines.

Figure 3 shows the range of different interaction archetypes we identified as evident in the OFF. On the one hand, some participants saliently associated themselves with the very intersection of both fields (a). Those who were locked into their individual respective field, i.e. scenarios or design, sometimes fed-in (b) ideas, facts, and synergies to counterparts in the other field. Others, wishing to engage more deeply, went for a bridging (c) effort that translated and connected concerns across the two fields. On the other hand, some participants divulged tensions (d) which might be leveraged or consolidated, but also led into outright repulsion (e) that signaled greater distancing between the two fields. The negation of the conveners' initial narrow focus on solely *intersections*, extended also to reveal other relations beyond intersections such as feed-in, bridging, tension, and outright repulsion reinforced the reason for convening this Forum – identify a set of promising yet complicated interactions between scenarios and design researchers and practitioners which research and practice will investigate in the future. We expect the four additional archetypes of interaction we identified through this effort to be worthy of further investigation through a careful design of a follow-up Forum and/or empirical qualitative study by colleagues who may ascribe to either camps and fall within any one of the respective alternative modes of interaction.

The fact that many designers must first design before they can describe, while scenario planners must first describe before they can design fostered a creative tension that ran throughout the OFF. An important finding from our convening and running the OFF was that in scenarios and design practices and thinking there is a tension between ideas and abstraction. The exhibition too revealed tensions between relishing ambiguity and multiple and contradictory interpretations, and constructing artefacts to make things simpler; creating parts, or assembling wholes; and making the unfamiliar strange and the strange familiar. We believe therefore that the OFF outcomes benefitted from these creative tensions not only

between fields but also in connecting practice to theory.

Figure 3: Archetypes of “spaces” relating Scenarios and Design



Of course, these tentative findings are open to critique in so far as they are limited by who participated in the Forum. The participants were primarily Western. We only had a dozen scholarships to offer which regrettably ruled out some people who lacked institutional sponsorship or resources to attend. We were limited by the time and space allowed for by operational concerns. We did work hard to balance the attendance between those who identified themselves primarily as designers or scenarists, and strove to include scholars and practitioners who spanned both fields. That there were often unclear boundaries between these categories, and that participants were not labeled as either, was an asset that likely enabled people to ‘trade places’. Certainly the OFF helped generate many new questions and began the process of coalescing two communities, which may one day evolve into an independent community of practice and research on scenarios and design.

V. Conclusions

How well did our methods, the design of the OFF, work open up and articulate new areas of research? We sought to engage two communities of practice-led fields to discover new opportunities for interaction, support rigorous and practical reflection, methodological invention, and to reduce the gap in practice and theory for both fields. With the OFF

embedded in an academic setting, we sought to produce publications from the event itself and from subsequent collaborations it helped foster. It is clear that the Forum was successful in attracting keen interest in response to our call for abstracts; it expanded the initially theorized five intersections into four other archetypical notions of expanded spaces of opportunity; it was designed innovatively around generative dialogue but also emergent artefacts that helped to bridge theory with practice; and 21 initiatives were kicked off for collaborative projects in research and practice. We believe the Forum was particularly successful in fostering in new ways an open space for interaction catalyzed by the exhibition and exercises drawn from prototypical design making.

The 2014 OFF was conceived of as a crane (Normann 2001) that allowed each participant alone and with others to look at scenarios and design -and their relations- from an otherwise and up to now non-existent perspective and to come down from the crane to the ground and test the practical implications of seeing things in a new way. The conversations and interactions created and brought together novel views on each of the practice led fields of scenarios and design, their differences and similarities, and on how they support or challenge each other. We hope they lead to new, grounded practices. In the end, the OFF enabled participants to contribute exciting ideas and intriguing – if sometimes disturbing – images that we hope will resonate in scholarship and in practice for years to come. As evidenced from the scoping opportunities presented in this paper, several of which have already been pursued as demonstrated in this special issue, we believe the OFF was successful in amplifying some of the emerging intersections between scenarios and design resulting in the creation of new knowledge, projects and artefacts in these different yet complementary fields.

References

- Barry, A., Born, G. and G. Weszkalnys. 2008. Logics of interdisciplinarity. *Economy and Society*, 37: 1, 20 — 49.
- Barry, M. 2007. Innovation as a learning process: Embedding design thinking. *California Management Review*, 50(1), 25.
- BERG, 2014. BERG London. Available at <http://berglondon.com/films/> (Accessed 07 Dec 2014)
- Bhatti, Y., Kimbell, L., Ramirez, R. & Selin, C. 2013. Scenarios and Design: Scoping the dialogue space for Oxford Futures Forum 2014. Said Business School, 5th December, 2013. Available at <http://www.oxfordfuturesforum.org.uk>. (Accessed 26 October 2014).
- Binder, T., de Michelis, G., Jacucci, G., Linde, P., & Wagner, I. 2011. *Design Things*. Cambridge: MIT Press.
- Bradfield, R. M. 2008. Cognitive Barriers in the Scenario Development Process. In: *Advances in Developing Human Resources*, 10: 198-215.
- Bradfield, R., Wright, G., Burt, G., Cairns, G., & Van Der Heijden, K. 2005. The origins and evolution of scenario techniques in long range business planning. *Futures*, 37(8): 795-812.
- Buxton, B. 2007. *Sketching User Experience. Getting the design right and the right design*. San Francisco, CA: Morgan Kaufmann.
- Byrne, D., S. Davies, A. Kelliher & C. Selin (Curators). 2012. *Emerge: Redesigning the Future*. Museum Exhibition. Arizona State University Art Museum. Tempe, AZ.
- Candy, S. 2010. *The Futures of Everyday Life: Politics and the Design of Experiential Scenarios*. Doctoral dissertation, University of Hawaii at Manoa. Available at: <http://www.scribd.com/doc/68901075/Candy-2010-The-Futures-of-Everyday-Life>.
- Carlile, P. R. 2002. A pragmatic view of knowledge and boundaries: Boundary objects in New Product Development. *Organization Science*, 13(4): 442–455.
- Cross, N. 2006. *Designerly Ways of Knowing*. Berlin: Springer.
- Czarniawska, B. and Joerges, B. 1996. Travels of ideas in Translating Organizational Change. B. Czarniawska & G. Svon (eds). Berlin: Walter der Gruyter: 13-48.
- Davies, SR, Selin, C, Gano, G & Pereira, ÂG. 2012. Citizen engagement and urban change: Three case studies of material deliberation, *Cities*, vol 29, no. 6: 351-357.
- de Geus, A.P. 1988. Planning as Learning, *Harvard Business Review*, 66(2): 70-74.
- Dunne, A. and Raby, F. 2013. *Speculative Everything*. Cambridge: MIT Press.

- Ehn, P. 2008. Participation in design things. In Proceedings of the Tenth Anniversary Conference on Participatory Design, October: 92-101. Indiana University.
- EPIC, 2013. The Ethnographic Praxis in Industry Conference. Available at <http://epiconference.com/>(Accessed 07 Dec 2014)
- Hatchuel, A. 2001. Towards Design Theory and Expandable Rationality: The Unfinished Programme of Herbert Simon, *Journal of Management and Governance*, 5(3–4): 260–73.
- Hatchuel, A. and B. Weil. 2009. C-K Theory: An Advanced Formulation, *Research in Engineering Design*, 19(4): 181–92.
- Henderson, K. 1999. *Online and On paper: Visual Representations, Visual Culture, and Computer Graphics in Design Engineering*. Cambridge, MA: MIT Press.
- Hodgkinson, G.P., M.P. Healey. 2008. Toward a (pragmatic) science of strategic intervention: design propositions for scenario planning, *Organ Stud* 29(3): 435-457.
- Inayatullah, S. 2009. Questioning scenarios, *J Future Studies* 13(3) pp.75-80.
- Islei, G.,
- Kimbell, L. 2014 *Service Innovation Handbook*. Amsterdam: BIS Publishers.
- Lang, T. 2012. *Essays on how scenario planning and the building of new social capital are related*, Unpublished doctoral dissertation, University of Oxford, Oxford.
- Latour, B. and Weibel, P. 2005. *Making Things Public: Atmospheres of Democracy*. MIT Press.
- Lawson, B. & Dorst, C.H. 2009, *Design Expertise*, First, Architectural Press (Elsevier), Oxford, UK.
- Le Masson, P., Dorst, C.H. & Subrahmanian, E. 2013, 'Design theory: history, state of the art and advancements', *Research In Engineering Design*, vol. 24, no. 2: 97-103.
- Lockett, G., Naudé, P. 1999. Judgemental modelling as an aid to scenario planning and analysis, *Omega* 27(1): 61-73.
- Mueller & Whittle 2011. Translating management ideas: a discursive devices analysis, *Organization Studies*, 32(2): 187-210
- Normann, R. 2001. *Reframing business: When the map changes the landscape*. Wiley.com.
- Radford, N. 2012. *From Design Fiction to Experiential Futures*. Available online at: <http://news.noahradford.com/?p=1625> (Accessed 4 Dec, 2013).

- Ramírez, R. Chapter 11 in Ramírez, R., Selsky, J.W., van der Heijden, K. 2010. Business planning for turbulent times: New methods for applying scenarios, 2nd ed. Earthscan, London.
- Ramírez, R., Selsky, J.W., van der Heijden, K. 2010. Business planning for turbulent times: New methods for applying scenarios, 2nd ed. Earthscan, London.
- Sandberg, J. and Alvesson, M. 2011. "Ways of Constructing Research Questions: Gap-Spotting or Problematization?" *Organization* 18/1: 23—44
- Schnaars, S. P. 1987. How to develop and use scenarios. *Long range planning*, 20(1): 105-114.
- Schoemaker, P.J.H. 1993. Multiple scenario development: Its conceptual and behavioral foundation, *Strateg Manag J* 14(3): 193-213.
- Schon, D.A. 1983. *The Reflective Practitioner*. New York: Basic Books.
- Schwartz, P. 1996. *The art of the long view: scenario planning - protecting your company against an uncertain future*, John Wiley and Sons, Chichester.
- Selin, C. 2006. Trust and the Illusive Force of Scenarios, *Futures* 38 (1): 1-14.
- Singleton, B. 2012. *On Craft and Being Crafty: Human Behaviour as the Object of Design*. PhD Thesis. University of Northumbria.
- Simon, H. A. 1996. *The sciences of the artificial*. MIT press.
- Strategy, 2010. *Strategy as Practice International Network*, Available at: <http://www.s-as-p.org/>
- Simonsen, J, and Robertson, T. (eds) 2012. *Routledge International Handbook of Participatory Design*. New York: Routledge.
- Suchman, L. 2003. *Located Accountabilities in Technology Production*, published by the Centre for Science Studies, Lancaster University, Lancaster LA1 4YN, UK, Available at <http://www.comp.lancs.ac.uk/sociology/papers/Suchman-Located-Accountabilities.pdf>
- Systemic Design. 2014. *Emerging contexts for systems perspectives in design*. Conference website. Available at <http://systemic-design.net/rsd3-abstracts/>
- Tonkinwise, C. 2014a. Design studies: What is it good for? *Design and Culture*, 6(1): 5-44
- Tonkinwise, C. 2014b. How We Intend to Future: Review of Anthony Dunne and Fiona Raby, *Speculative Everything: Design, Fiction, and Social Dreaming*. *Design Philosophy Papers*, 12(2).

- van der Heijden, K. 2005. *Scenarios: the art of strategic conversation*, Wiley, Chichester.
- Wilkinson, A. 2009. Scenarios Practices: In Search of Theory, *Journal Future Studies* 13(3): 107-114.
- Van de Ven, A. H. 2007. *Engaged Scholarship: A Guide for Organizational and Social Research: A Guide for Organizational and Social Research*. Oxford University Press.
- Van de Ven, A. H. 2010. Reflection on Engaged Scholarship: October 1. London Business School. Available at <http://www.aimresearch.org/uploads/file/Presentations/New%202010%20Presentations/VandeVen-LBS-10-1-10.pdf> (Accessed 10 Dec 2014)
- Winnicott, D. W. 1960. The theory of the parent-infant relationship, *International Journal of Psychoanalysis*, 41(6): 585-595.
- Wolf, M. 2010. Sociology of translation. *Handbook of Translation Studies*. Amsterdam & Philadelphia: Benjamins: 337-343.
- Wright, G., G. Cairns, R. Bradfield. 2012. Special issue on Scenario Method: Current developments in theory and practice, *Technology Forecasting & Social Change* 79(1): 198.