

Vapourworlds and Design Fiction: The Role of Intentionality

Paul Coulton^{*}, Joseph Lindley

Imagination, Lancaster Institute for the Contemporary Arts, LICA Building, Lancaster University, Lancaster, UK, LA1 4YW

*Corresponding author e-mail: p.coulton@lancaster.ac.uk

Abstract: There is a long tradition of designers creating visions of technological futures. We contrast the properties of two related types of future envisionment, whose commonality is using ‘world building’ to showcase or prototype technological concepts. We consider commercial visions that depict potential future products within possible future worlds, and by extending the concept of Vapourware we term these ‘Vapourworlds’. We contrast Vapourworlds with Design Fictions, a class of envisionment that inherits qualities of criticality and exploration from its familial antecedents’ radical design and critical design. By comparing these two approaches we intend to shed light on both. Superficially these world building endeavours appear similar, yet under the surface an underlying difference in intentionality permeates the substance of both practices. We conclude with a position that by highlighting the contrasts between these practices, mutually beneficial insights become apparent.

Keywords: Design Fiction, Vapourware, Vapourworlds, Design Futures.

1. Introduction

In the post-Internet era, design’s role in shaping the world is becoming increasingly vivid. Powered by rapid prototyping, digital media, and network effects, the pace at which designers influence palpable change in the world is staggering. Increasingly products and services exist within the new complexities of social networks and data. This relentless progress is underwritten by Gordon Moore’s famous prediction that computing power will double roughly every two years. Riding a wave of digitization, the designed world feels, at times, like a runaway train that is accelerating towards the near future’s horizon. In these rapidly changing times, designers have a role in fueling the engine of the accelerating train, but *also* in preparing us for what future awaits us down the track. In this paper, we contrast two approaches to design futures. Both rehearse the future so as to prepare us for its arrival, but in differing ways and with differing motivations. In this first part of the paper we explicate both Vapourworlds and Design Fictions, introducing their intended purpose and describing their theoretical background. In the second half of the paper we contrast the intentionality that lies

beneath each practice in order to identify attributes within each that may be relevant and beneficial to the other.

2. Vapourware, Visioning, and Vapourworlds

Vapourware is a term commonly used to describe software and hardware that is announced, sometimes marketed, but is never actually produced (Atkinson 2013). This means that in some way all Vapourware ‘breaks promises’ and while the majority do not appear to be deliberately deceitful on occasion Vapourware *has* been used nefariously by companies to inflate share prices, create extra publicity for their brand (Ofek and Turut 2013), or even deter competitors entering a market (Bayus, Jain, and Rao 2001). However, these malign examples are relatively rare, and there are other benign explanations for why Vapourware is produced. The desire to create something revolutionary and ground-breaking, particularly when combined with grandiose fixations on perfection, often arrive at expectations or aspirations that are beyond a designer or organisation’s ability to produce. ‘Over promising’ in this way can in fact arrest progress by imparting undue pressure on research and development teams, which in turn can delay product launches so much that competitor products reach the market quicker, hence the original and overpromised design likely becomes Vapourware. The pace of technological development itself is another driver of Vapourware, products often become outmoded and unfortunately scrapped before they are released. The rise of crowd funding via companies such as Indiegogo and Kickstarter has provided new routes to market for innovators, but alongside they have also provided new ‘routes to Vapour’. Arguably all products listed by crowdfunding websites are Vapourware until the point the product is both successfully funded and shipped to the backers. Vapourware *is* however different from carefree speculation or dreaming. Nefariously created Vapourware notwithstanding, in the eyes of those who produce it, Vapourware *will* become a reality. Hence, Vapourware is *designed*.

Vapourware sometimes becomes part of larger corporate ‘visioning’ projects. These projects have become a staple of technology companies and showcase future worlds in which companies, and their products, are enablers of a ‘better’ future. These depictions demonstrate early stage concepts, not yet ready for the market, as such their purpose is primarily for strengthening brands by seeding the future desires and expectations of customers. These worlds are created so that the products companies design for and place within them ‘make sense’. Corporate visioning projects take steps beyond concept designs, or even Vapourware, as they make visible customers, products, and environments interacting together, in context (albeit the context of an imagined future world).

One example of such a future world was Futurama (figure 1). Commissioned by General Motors, designed by Norman Bel Geddes, and exhibited at the New York World’s Fair of 1939, Futurama was akin to a fairground ride, that physically transported visitors over a huge diorama of a fictional section of the United States. It depicted a future defined by free-flowing movement of people and goods across the country, but with increased speed and efficiency. Futurama is widely credited for introducing the American public to the concept of a network of expressways connecting the nation. It painted a picture of a future where millions of cars, with millions of miles of roads to drive on, was desirable. Futurama set an agenda, significantly influenced transportation and planning policy, and seeded the affirmative narrative around automobiles, the ‘product’ that became one of the figureheads of American consumerism.



Figure 1. Photograph of Futurama as it was exhibited at the 1939 World's fair in New York.

A more recent video-based example is 'A Day Made of Glass' (figure 2 and <https://youtu.be/PfgmIVxLC9w>). Produced by Corning, a manufacturer glass for smartphones and other touch-screen displays, the video portrays a series of scenarios in which a family interacts with a variety of interactive surfaces that can provide different forms of control and/or information. As with Futurama and General Motors, the future portrayed in the video is a world in which Corning's products would be an integral component of this future.



Figure 2. Screenshot of 'A Day Made of Glass' depicting one of many possible applications for interactive digital displays.

We introduce the neologism *Vapourworld* to describe this class of design future. Vapourworlds contain potential *Vapourware*, but these visions are shown in the context of a wider artificial world. They show technologies being applied in various ways, impacting upon everyday lives of the people that live in the fictional. In Vapourworlds people cohabit with Vapourware in context, and hence Vapourworlds present "situated" (Suchman 1987) Vapourware.

3. Design Fiction Worlds

Design Fiction is still a relatively young field and unfortunately still exhibits some pre-paradigmatic angst. What this means is that competing understandings and framings of the practice coexist incongruently, resulting in ambiguity within discussions about Design Fiction. To make our position clear, we align with a contemporary movement which describes Design Fiction as a world building activity (Coulton, et al. 2017). Whilst the *means* of Design Fiction (the objects and artefacts produced by practice) are diverse and varied, the *end* of Design Fiction is always the creation of a fictional world. To contextualise this framing, in the following we review Design Fiction's origin.

The term was coined almost incidentally by the science fiction author Bruce Sterling when he was describing how design thinking impacted his literary output, "Design Fiction reads a great deal like science fiction; in fact it would never occur to a normal reader to separate the two" (Sterling 2005). Later, he refined his thinking, saying that Design Fiction is "the deliberate use of diegetic prototypes to suspend disbelief about change" (Sterling in Bosch 2012). This later refinement owes much to Julian Bleecker's essay on the subject (Bleecker 2009), which is probably the most influential single text on the topic. Bleecker himself was drawing on, among others, David Kirby's research into how science informs, and is represented, in cinema (Kirby 2010). It is from Kirby's research that the concept of 'diegesis' found its way into Design Fiction discourse. Diegetic, as Kirby uses the word, simply means 'in the fictional world'. So, inheriting that meaning, the 'diegetic prototypes' in Sterling's definition, are prototypes which only exist within the unreality of a fictional world. In summary Design Fiction "tells worlds not stories" (Sterling in Bosch 2012).

With roots going back to radical design in the 1960s and being heavily influenced by practice at the Royal College of Art through the late 1990s and early 2000s, Design Fictions share ideological and aesthetic elements with speculative and critical design movements. They are however quite different in several important aspects and the intentional use of world building is primary amongst them (Coulton, et al. 2017). While speculative designs may well conjure qualities of an alternate world via art-like artefacts, Design Fictions use any media they can to give life to fictional alternate worlds, worlds within which the artefacts that define them make sense. Reflecting on examples of Design Fiction practice demonstrates this. For example, several artefacts, in this case a software development kit, 3D computer model, and crowd funding video, come together to invoke a fictional world in which an empathy detecting machine can plausibly exist (Sturdee, et al. 2016). Oftentimes, Design Fiction worlds are created, as with this 'empathy detecting machine', in the space between several individual artefacts, all of which belong to the Fictional World (although this can also be achieved with a single artefact). The 'Ikea Catalog From the Near Future' showcases how a single artefact can articulate, with detail and refinement, an entire fictional world (Bleecker 2015). In Design Fiction, the forms these artefacts take, the media used to create them, and whether they are physical, digital or a hybrid, are all flexible. If the world that a selection of Design Fiction artefacts collectively create is viewed as a single entity, then each artefact may be viewed as an 'entry point' that represents that world viewed from different scales (figure 3).

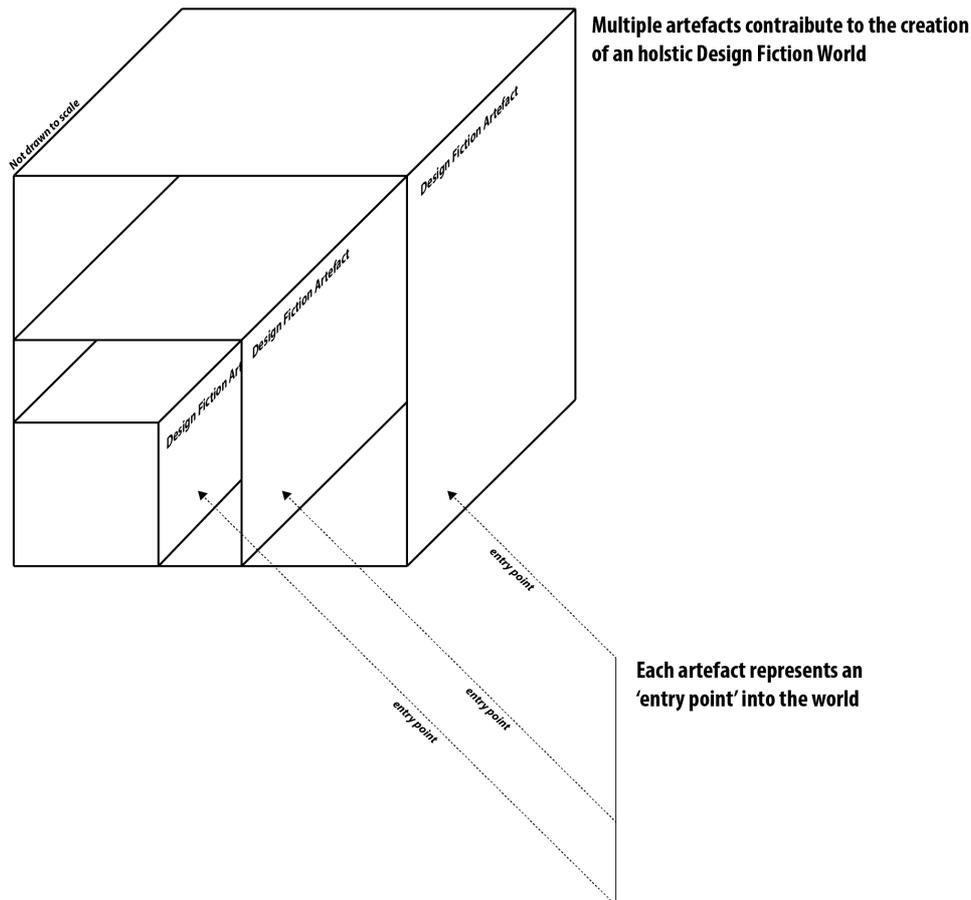


Figure 3. Visual representation of how several artefacts combine to invoke a Design Fiction world. Each artefact represents an 'entry point' or 'window' into the Design Fiction's inner world.

Although the approach is not confined to this area, Design Fictions are, invariably, concerned with near-to-medium term technologic futures. The worlds they build are prototyping environments for technological concepts, and while critical or speculative design work may be considered as equivalents of *Vapourware*, Design Fictions are the corresponding equivalent for *Vapourworlds*. Although we posit that Design Fictions and Vapourworlds have much in common – most significantly their dependence on 'situated' world building – the thesis of this paper is, in fact, to contend and reflect upon their differences, so as to provide useful insights for practitioners working in both spaces.

4. Contrasting Intentionality

Here we explore contrasts evident with the gamut of design futures that contains both Vapourworlds and Design Fictions. We assert that these contrasts are driven by the intentionality underlying why one of these futures approaches would be used in the first place. These aspects are all connected but may also be described in isolation. In the following we explore these intentions. What stimulates the creation of the speculation? How does intent impact upon the design process? How do intent-driven design decisions manifest in terms of how audiences interact with Vapourworlds or Design Fictions?

Let us consider *why* one would create a Vapourworld. Vapourworlds are created, predominantly by corporations, whose primary concern is in generating profit. As discussed in our introduction to *Vapourware*, drivers for creating Vapourworlds are diverse and may include inflating stock prices, deterring competitors, communicating grand visions, seeding positive narratives about future

markets or to elicit crowd funding. Directly, or indirectly these are all linked to profitability. In contrast, with radical design heritage, Design Fictions implicitly have an elucidative edge. Being exploratory and inquisitive is a definitional characteristic. With this contrast in mind it is perhaps not surprising that Design Fiction is predominately practiced in academia and by grant-supported private practices: public money is almost always what pays for Design Fiction. Notions of profitability, or considerations related to profitability, may well form *part* of a Design Fiction world in order to make the fiction appear plausible, however, increasing a corporation’s ability to be profitable is rarely the *intention* behind Design Fiction practice. This is, perhaps, one of the reasons why ironic humour and dystopia are common features in Design Fictions (cf. ‘lifetime subscription shampoo’ in Bleecker 2015), but rarely seen in Vapourworlds. Presenting amusing dystopic malfunctions would surely *not* fulfil the affirmative intentions of Vapourworlds.

Characteristics representing the underlying intentionality are often carried forward into how Vapourworlds or Design Fictions are built. Discussing the rather fuzzy concept of ‘the future’ is always challenging, but tools like Joseph Voros’ ‘futures cone’ are widely used in order to mediate this difficulty. The cone is based around several qualifiers; probable, plausible, possible and preferable. Each qualifier is subjective to some extent, but they are usually considered roughly as follows. *Possible* describes any future permitted by the physical laws of the Universe no matter how unlikely that is (e.g. forward time travel relative to another body made possible by Einstein’s special relativity). *Plausible* refers to futures that are not *as* difficult to imagine, but would not be easy to predict (e.g. the United Kingdom voting to leave the EU and Donald Trump’s election as President of the United States of America in 2016). *Probable* futures are quite likely to happen but not completely certain (e.g. Apple releasing an updated iPhone during 2017). The final qualifier – *preferable* – represents what ‘we’ would ‘like’ to happen. It is moveable and it overlays one or more of the other qualifiers. For example, some preferable futures lie within the realms of the plausible, but outside any notion of probable (see figure 4). The preferable qualifier implies a singular future along a uniquely desirable path forward ahead. A ‘future elect’, if you will. These sentiments are nurtured and carried by Vapourworlds, they communicate *the* vision that is relevant to the underlying intention of the company creating the Vapourworld. These considerations are exemplified by Futurama. General Motors and Bel Geddes were clearly advocating for a road-centric future (and not giving credence to any other future). The future in Futurama was positive, bright, and functional. There were no alternatives. That is not to say that Design Fictions cannot be utopian too (Sturdee et al. 2016; Coulton, Lindley, and Akmal 2016), however for Vapourworlds there seems little choice, they, judging by precedents, *must* be gloriously shiny and white-walled.

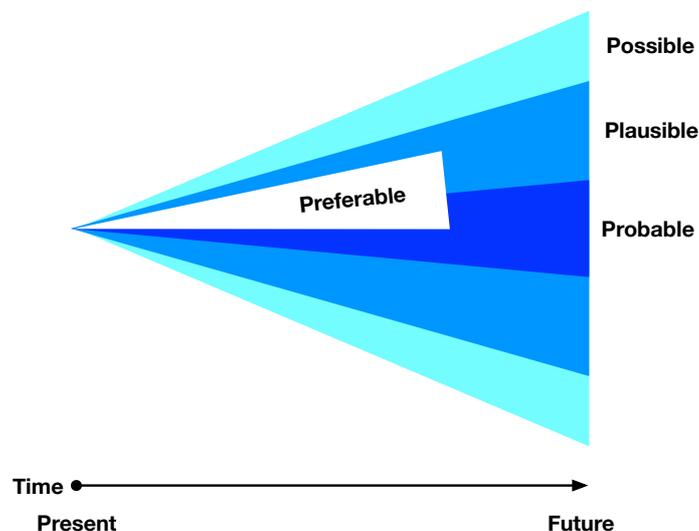


Figure 4. The futures cone depicting all futures as resolving to a point in the present and having no history.

The future cone has been criticised however, with commentators suggesting that for speculations such as Design Fictions, perhaps Voros' cone is not always fit for purpose. For example, Coulton, Burnett, and Gradinar argue that 'what is preferable?' is a question that speculative designers should ask repeatedly throughout their design process, and to not be the whole aim of the design (2016). Bowen reflects on this, criticizing the cone as enhancing privilege by "promoting elitist views of a 'better world' that society should aspire towards" (2010). Although they also endorse their own version of the futures cone (and its preferable dimension), Dunne & Raby say of speculative design, critical design, and Design Fiction "the idea is not to show how things will be but to open up a space for discussion" (2013). Starting from their position it seems pertinent to ask whether presenting a singular, affirmative, and 'preferable' vision of the future the best way to stimulate discussion? The resolution of this question is beyond the bounds of what we are able address within this paper but what *is* clear is how the intentionality behind Vapourworlds drives them towards specifying a singular preferable future. In contrast Design Fiction's attempt to elucidate potentials in order to understand and explore in concert with an acceptance that the futures must be considered as plural, means Design Fictions have the potential to develop more nuanced and representative notions of what may be considered 'preferable'.

Somewhat counterintuitively, the past plays just as much an important role in understanding the intentionality of a speculation, as the future does. Vapourworlds tend to omit any references to their relative past (i.e. 'the past relative to the future portrayed in the Vapourworld', which, by definition, includes *our* present). This is evident in both *Futurama* and *A Day Made of Glass*. They both overtly portray worlds in which everything - screens, cars, roads, and *people* - appear to have emerged from the same moment in time. There is nothing old in these worlds, and nothing appears to have any history or patina. Of course, this makes sense when we bear in mind the intent driving the creation of those Vapourworlds. Building a world with awareness of the past brings with it 'mess'; product lifecycles, interoperability issues, elderly users, malfunctions, data breaches. Vapourworlds suppress audience's temptations to ask these questions by obscuring the fact that in the future new technologies will exist alongside accumulated old ones. To give a very practical example today our roads are shared by all vehicles driven by several generations of technology naturally aspirated combustion engines, gasoline/electric hybrids, and fully electric and semi-autonomous vehicles. The future is an 'accretive space' (Foster 2013) full of legacy technologies, this difficult truth is misaligned with the intentionality of Vapourworlds. Hence, Vapourworlds are 'temporal islands', isolated and alone in time. In contrast, and as with the plurality of the future, Design Fictions are more likely to import elements of the past into the futures they depict.

This mismatch makes us mindful of Marshal McLuhan's words "We look at the present through a rear-view mirror. We march backwards into the future" (McLuhan and Fiore, 1967). In this phrase McLuhan reminds us that there is no universally accepted view of the past, or indeed the present, as the futures cone might suggest. Rather, there are a plurality of pasts and futures, which are individually constructed in order to assemble an individual reality (Law and Urry 2004). In the case of Vapourworlds, the individual reality that is constructed will naturally tend towards one that is preferable in the eyes of the corporate vision. Where creators of Vapourworlds do not have scope to explicate the past, Design Fiction practitioners usually do. In fact, extrapolating from the present along plausible trajectories (see figure 6) is often the *modus operandi* when building Design Fiction worlds (Auger 2013; Blythe & Encinas 2016). Building worlds in this way is intentional and aims to empower the discussions and explorations that Design Fictions nurture. Considering these observations, we propose a more representational alternative model to the futures cone (figure 5). Here we have adapted a diagram from Gonzatto, van Amstel, Merkle, and Hartmann (2013) whose hermeneutic model represents the 'interpreted present' as an interplay between past, future, reality and fiction and integrated it with the futures cone.

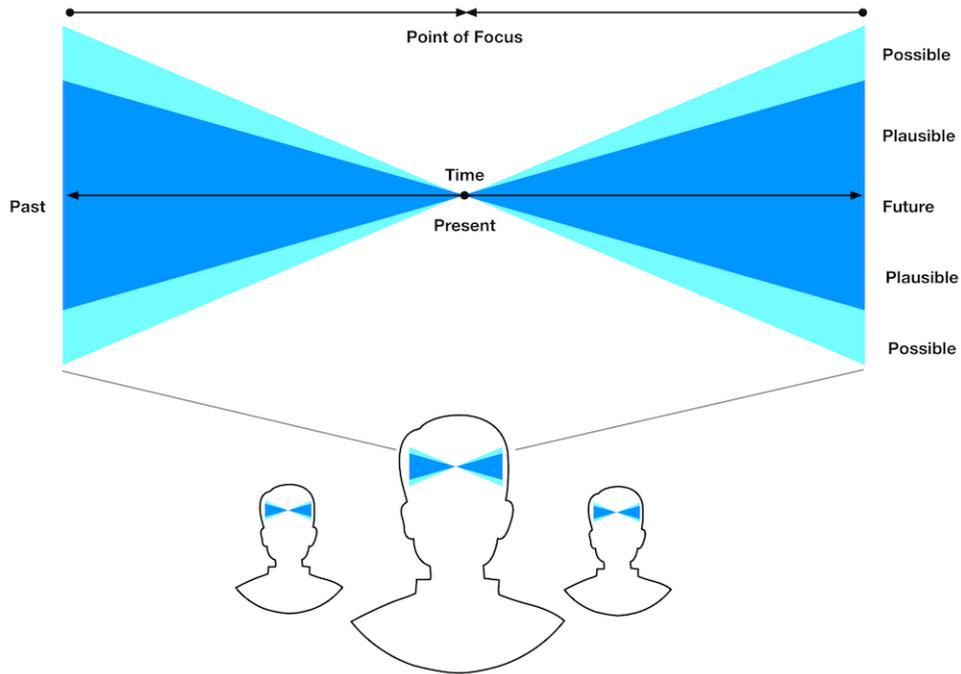


Figure 5. A hermeneutic model of the future; everyone’s interpretive interplay between history, fiction, past and present.

These characteristics culminate in the stark contrast of how Design Fictions and Vapourworlds may be ‘read’ or interpreted. The plurality of Design Fictions, their appreciation for legacy, and their critical aims, clearly impact upon how practitioners intend them to be read. Design Fictions frame visions of the future around the premise that ‘this could happen’ as opposed to ‘this will happen’. In this way, the intentionality guiding how a Design Fiction should be read is of a carefully articulated and well considered ‘what if’ question. On the other hand, Vapourworlds, despite factors that import un-believability (e.g. no history), tend to show apparently dogmatic ‘truths’. Rather than exploring the plurality of what the future *could* be (with an appreciation that the provocation will stimulate debate), Vapourworlds present their own concoction of what the future *will* be (with awareness that this incarnation of the future becomes more likely to pass if it is depicted in a Vapourworld). However, despite the sometimes-polarized differences in *why* they are created, and with what intent, both Vapourworlds and Design Fictions explore our pathways to the future (figure 6).

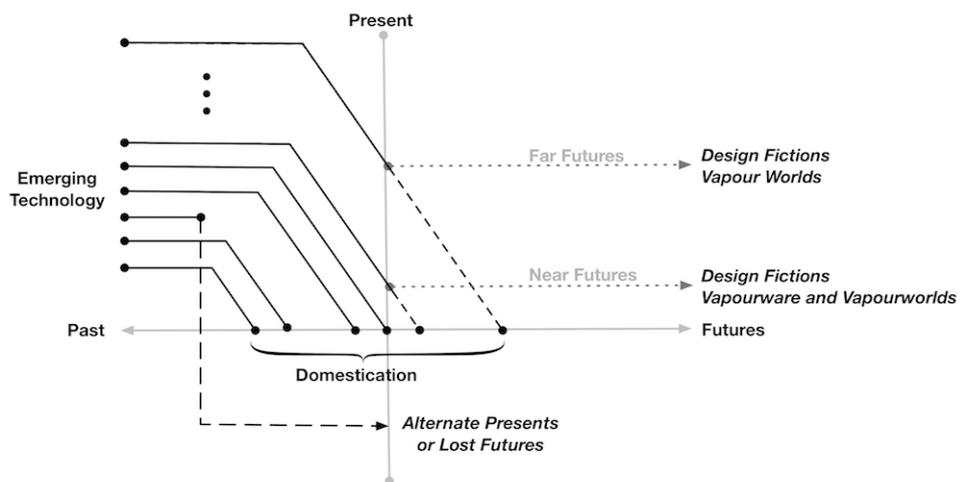


Figure 6. Plotting emerging and conceptual technologies into the future where they are domesticated.

The underlying intentionality clearly impacts upon why somebody would want to create a speculation in the first place. That base intent is carried through into the specifics of how a Design Fiction and Vapourworld are designed and crafted, as well as how they are perceived and interpreted. In our conclusion, we use this discussion of contrast as the basis to offer mutually relevant insights for practitioners in both spaces. What can purveyors of Vapourworlds learn from Design Fiction practitioners and conversely what properties of Vapourworlds will empower Design Fiction practice?

5. Conclusions

Although Vapourworlds and Design Fiction have common ground, clearly they are distinct spaces, serve their own purposes, and have individual attributes. Perhaps related to the contrasting intentionality discussed, there is also a variance in scope and reach. Notable Vapourworlds usually have a broad reach, stemming from a popular appeal. Our examples uphold this idea, Corning's Day Made of Glass has been viewed more than 25 million times online, while Futurama – a physical exhibit – was filled to its capacity and attracted 30,000 visitors per day. In contrast, many Design Fictions have, relative to Vapourworlds, smaller audiences. Although the marketing expertise and broad influence of corporations creating Vapourworlds help to increase their exposure, it may also be in part their aesthetic that contributes to their popular appeal. Design Fictions rigorously pursue plausibility and believability, in part so that the discursive spaces they aim to create are suitable vehicles to assist in the academic production of meaningful. In pursuing plausibility and rigour over broad appeal, might Design Fiction practitioners needlessly limit their audience? Perhaps. Although popular examples of 'incidental design fictions' (Lindley 2015) such as the television show Blackmirror show that Design Fictions *can* have a mass appeal, for practitioners without the budget and expertise to create a broadcast quality drama, achieving mass appeal in this way is impractical. However, Vapourworlds can be a source of inspiration, a source of recognizable forms, memes, and tropes to incorporate into 'audience-ready' Design Fiction.

We may also consider the disingenuousness inherent in Vapourworlds, a factor that, as is borne out in many of the stories around Vapourware, leaves consumers feeling hoodwinked, hard done by and as if a promise has been broken (Coulton and Lindley 2016). In these cases an unspoken covenant between designer and consumer is broken (Coulton, Lindley, and Akmal 2016). Could corporations create Vapourworlds that incorporate some of the intentionality that Design Fictions do, allowing their speculations to acknowledge history, and showing their products co-existing with old or broken technologies? Could Vapourworlds be created as 'what if' questions rather than 'promises'? Perhaps, for the increasingly savvy 21st century consumer, honesty will turn out to be the best policy and the underlying intentionality of Vapourworlds can be serviced by the techniques of Design Fiction. For example, the Design Fiction tropes of irony and humour used to engage audiences may translate well to Vapourworlds, without having to alter the foundational intentionality that lies behind their creation.

Historically, Design Fiction practitioners borrow ideas from wherever they can in order to construct plausible worlds (Coulton, et al. 2017). For example, fictional news articles, user manuals, advertisements, 'documentary' films and semi-functioning physical prototypes, have all been utilized to create Design Fiction worlds. Paying close attention to imitating whatever form they are pastiching has led some examples of Design Fiction to be indistinguishable from reality (Coulton, et al. 2017). With Design Fiction's tendency to borrow familiar formats in mind, and because both practices are very similar, and plot near-identical paths (e.g. figure 6), it seems clear that Vapourworlds are a worthy form for Design Fiction practitioners to imitate. Design Fiction projects imitating crowdfunding campaigns provides a recent example of this process occurring already (e.g. Søndergaard & Hansen 2016).

Where commercially-minded Vapourworlds and inquisitive Design Fictions collide, mutual interest emerges in the pressure of the collision. Despite the shared lineage of critical design and Design Fiction, the former places itself in opposition to commercial practice (Dunne & Raby 2013), meanwhile Design Fiction carries the critical intent but it is clear that practitioners feel free to flirt with forms and tropes borrowed from the commercial and corporate world. Design thinking plays an integral role in the creation of Vapourworlds and Design Fictions, yet by learning lessons from each other both practices may be empowered further. In doing so, creators of Vapourworlds and Design Fictions, may be given the tools to ensure the metaphorical runaway train of the future stays on track.

References

- Arnall, T. & Martinussen, E. (2010). Depth of field: Discursive design research through film. *FORMakademisk—research journal for design and design education*, 3(1).
- Atkinson, P. (2013). Delete: a design history of computer Vapourware. Bloomsbury Academic.
- Auger, J., 2013. Speculative design: crafting the speculation. *Digital Creativity*, 24(1), pp.11–35.
- Balsamo, A. (2011). Designing culture: The technological imagination at work. Duke University Press.
- Bayus, B. L., Jain, S., and Rao, A. G. (2001). Truth or consequences: An analysis of Vapourware and new product announcements. *Journal of Marketing Research*, 38(1), 3-13.
- Bleecker, J. (2009). Design Fiction: A short essay on design, science, fact and fiction. *Near Future Laboratory* 29.
- Bleecker, J., 2015. An Ikea Catalog From The Near Future – Design Fictions – Medium. Available at: <https://medium.com/design-fictions/an-ikea-catalog-from-the-near-future-e293938148bc#.l7c8mhhuu>.
- Blythe, M., and Encinas, E. (2016). The Co-ordinates of Design Fiction: Extrapolation, Irony, Ambiguity and Magic. *Proc. GROUPE'16*, 345–354. <http://doi.org/10.1145/2957276.2957299>
- Bosch, T. (2012). Sci-Fi writer Bruce Sterling explains the intriguing new concept of Design Fiction. *Slate*, March, 2.
- Bowen, S. (2010). Critical theory and participatory design. in Proceedings of ACM conference on Human Factors in Computing Systems CHI2010.
- Coulton, P., Burnett, D., and Gradinar, A. I. (2016). Games as speculative design: allowing players to consider alternate presents and plausible futures. In P. Lloyd, & E. Bohemia (Eds.), *Proceedings of Design Research Society Conference 2016*. (pp. 1609-1626). (Proceedings of DRS 2016; Vol. 4).
- Coulton, P., Lindley, J., and Akmal, H. A. (2016). Design fiction: does the search for plausibility lead to deception? In P. Lloyd, & E. Bohemia (Eds.), *Proceedings of Design Research Society Conference 2016*. (pp. 369-384). (Proceedings of DRS 2016; Vol. 1).
- Coulton, P., Lindley, J., Sturdee, M., and Stead, M. (2017). Design Fiction as World Building. In Proceedings of Research Through Design Conference 2017.
- Coulton, P., & Lindley, J. (2016). Game Vaporware as Design Fictions. In Proceedings of Mindtrek 2016 (pp. 341–349). ACM.
- Dunne, A., & Raby, F. (2013). Speculative everything: design, fiction, and social dreaming. MIT Press.
- Foster, N., 2013. The Future Mundane. *hellofosta.com*. Available at: <http://hellofosta.com/2013/10/07/the-future-mundane/> [Accessed October 7, 2014].
- Gonzatto, R. F., van Amstel, F. M., Merkle, L. E., & Hartmann, T. (2013). The ideology of the future in Design Fictions. *Digital creativity*, 24(1), 36-45.
- Law, J., & Urry, J. (2004). Enacting the social. *Economy and society*, 33(3), 390-410.
- Lindley, J., 2015. A pragmatics framework for design fiction. In *Proceedings of the European Academy of Design Conference*.

- Martinussen, E., Knutsen, J., and Arnall, T. (2014). Satellite Lamps, *Kairos: A Journal of Rhetoric, Technology, and Pedagogy*, Issue 19.1, Fall.
- McLuhan, M., and Fiore, Q. (1967). *The medium is the message*. New York, Bantam Books.
- Ofek, E., & Turut, Ö. (2013). Vapourware, suddenware, and trueware: New product preannouncements under market uncertainty. *Marketing Science*, 32(2), 342-355.
- Wundt, W. (1905). *Fundamentals of psychology* (7th ed.). Leipzig: Engelman.
- Søndergaard, M.L.J. and Hansen, L.K., 2016. PeriodShare. In *Proceedings of the 9th Nordic Conference on Human-Computer Interaction - NordiCHI '16*. New York, New York, USA: ACM Press, pp. 1–6.
- Sterling, B. (2005). *Shaping Things* (Mediaworks Pamphlets).
- Sturdee, M., Coulton, P., Lindley, J., Stead, M., Akmal, H.A., and Hudson-Smith, A. (2016). Design fiction: how to build a Voight Kampff machine. In CHI EA '16 Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems. (pp. 375-386). New York: ACM. DOI: 10.1145/2851581.2892574
- Suchman, L., 1987. *Plans and situated actions: the problem of human-machine communication*, Cambridge University Press.
- Voros, J. (2003). A generic foresight process framework. *foresight*, 5(3), 10-21.

About the Authors:

Paul Coulton is the Chair of Speculative and Game Design in the open and exploratory design-led research studio Imagination Lancaster. He uses a research through design approach to creative fictional representations of future worlds in which emerging technologies have become mundane.

Joseph Lindley is currently a Researcher on the EPSRC research project PETRAS working on acceptability and adoption for the internet of things and was previously a doctoral student researching design fiction at the HighWire Centre for Doctoral Training, Lancaster University.

Acknowledgements: This research has been made possible through the support of the RCUK Cyber Security for the Internet of Things Research Hub PETRAS (petrashub.org) under EPSRC grant EP/N02334X/1.