What's the matter with[in] design fiction?

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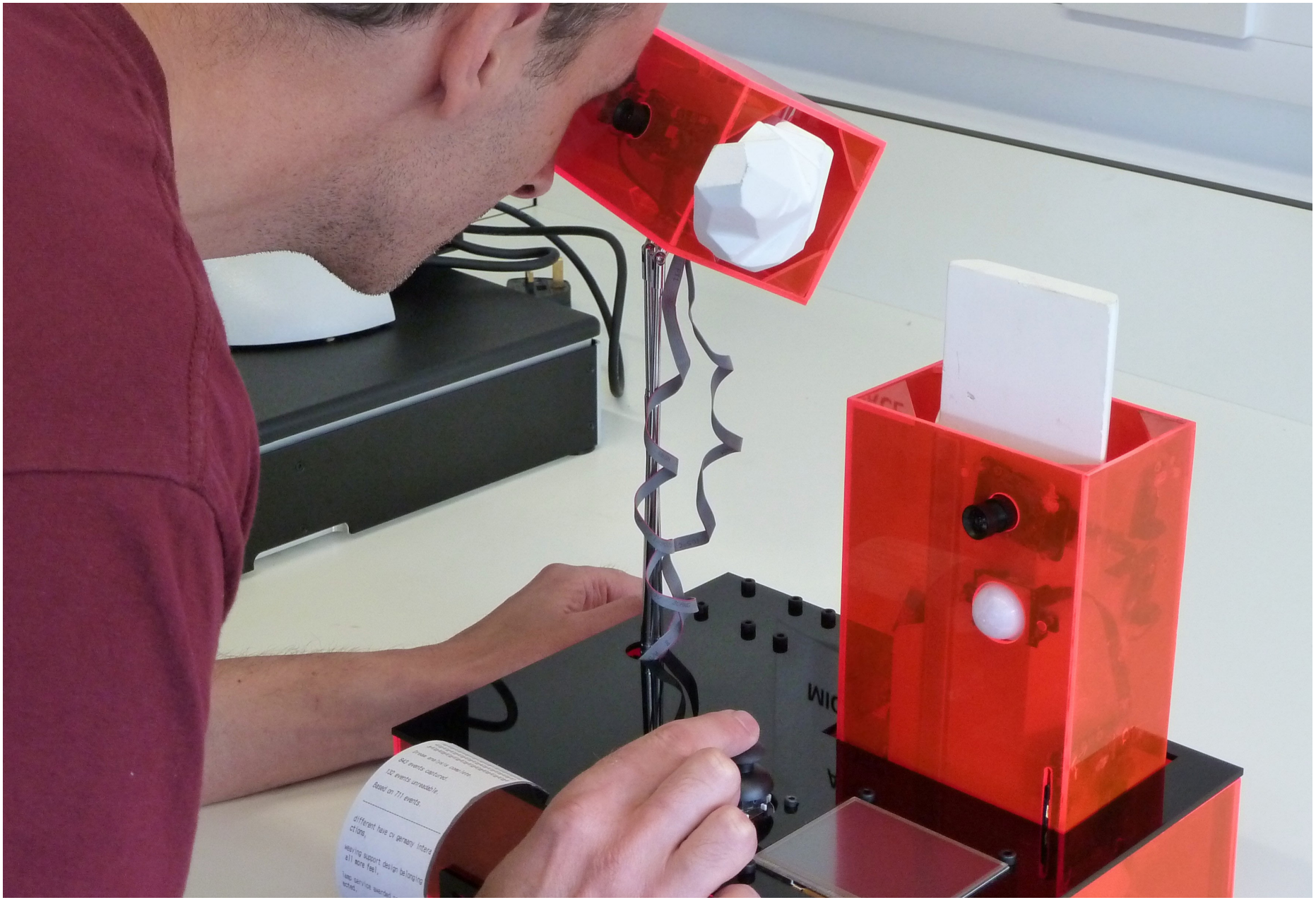
Keywords: Design Fiction; Digital Dreamcatcher; System; Autopoiesis; Suspension of Disbelief; Dream

Abstract: What design fiction is seems to be a matter of debate whilst how design fiction accomplishes its feats lacks attention among the design research community. This research program focuses on how people engage with a fictional story world through interactive artifacts or in other words, how disbelief is suspended when design is employed as an ingredient that embodies some aspects of a fictional narrative. In order to explore this, we invited four participants to interact with a purposefully designed prototype: the Digital Dreamcatcher. The Digital Dreamcatcher is a fictional device that interprets dreams by printing personalized poetry. Based on qualitative analysis from interviews with participants, we propose a preliminary conceptualisation of design fiction as system, rather than simply an object or a story. Looking at our data from the perspective of design fiction as a system also allowed us to identify "suspension of disbelief" only in autopoietic design fictions. These are design fictions able to create, extend and maintain themselves. This insight might enable practitioners using or considering the use of design fiction to look at their current or prospective work from a new perspective.



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Introduction and Background as Research Artefacts

The use of design within a particular fictional world is increasingly practiced not only in filmmaking (Bleecker 2009), industrial design (Google 2012) or urbanism (e.g. Bel Geddes Futurama exhibit in 1939) but also in research contexts (Blythe 2014). Of particular interest for the design research community (Hales 2013) is the term Design Fiction, a concept with a definition seemingly as malleable as the circumstances where it is applied (Post 1969). Overall, Design Fiction is intricately related to context, narrative and, of course, design. Lindley et al for example, define it as "Something that creates a story world and has something being prototyped within that story world" (Lindley 2015) and Sterling as "the deliberate use of diegetic prototypes to suspend disbelief about change" (Sterling 2012). What design fiction is seems to be a matter of debate, whilst how design fiction accomplishes its feats lacks attention among the design research community. Does the audience of a design fiction, like Futurama or Google Glass, automatically "suspend their disbelief"? and if so, why? Hence, this project focuses on how people engage with a fictional story world through design or in other words, how disbelief is suspended when design is employed as an ingredient that illustrates some aspects of a fictional narrative.

This project evolved from our previous work using prototypes as research

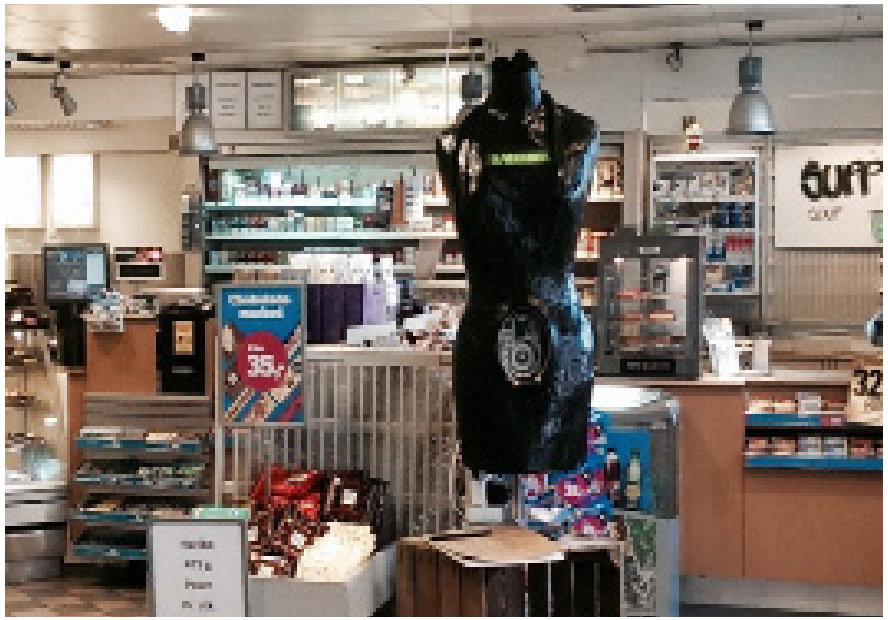


Figure 1. Chronotraption "Prana". Photo: Jonas Leonas. Prana, was devised to embody multiple metaphors of time (both from Eastern and Western culture) in a single object. It is a time keeping device that takes breath as the basic unit for measuring time. A LCD displays standard time in a particular format: instead of seconds, the clock ticks in pranas. A modified floppy disk drive in her abdomen mimics the dynamics of breathing.

artefacts in the field: *the Chronotraptions*. The Chronotraptions embodied significant principles on the phenomenon of time from a variety of scientific and cultural perspective. They were placed in a gas station and a tourist office to capture idiosyncratic aspects of time. In both environments, a notebook was placed next to the Chronotraptions as an invitation to passersby to answer the question "If you had made this object, how would you name it?". A title generally provides a hint into what an object means for its author, it focuses the ambiguity of a material

Figure 2. Chronotraption “TeleTikTak”. Photo credit: Jonas Leonas. TeleTikTak is a two-channel interactive modified computer CRT monitor. It displays a pixelated clock pendulum in black and white colors (channel 1) oscillating between two states (TIK and TAK) at a constant low speed. Channel 2 presents the movement of a metronome between the same TIK and TAK states, but at a faster speed and with a multicoloured shadow contouring the image. When someone approaches TeleTikTak and reaches for the mouse attached to it, the movement is detected and it automatically shifts from channel 1 to channel 2.

representation by pointing at a certain domain of meaning. Therefore, it seemed a suitable and convenient way to encourage observers to give relevant feedback on the Chronotraption without taking too much time. Breaching spatial conventions and kindly disrupting the ordinary, the Chronotraptions served the purpose of navigating and surfacing

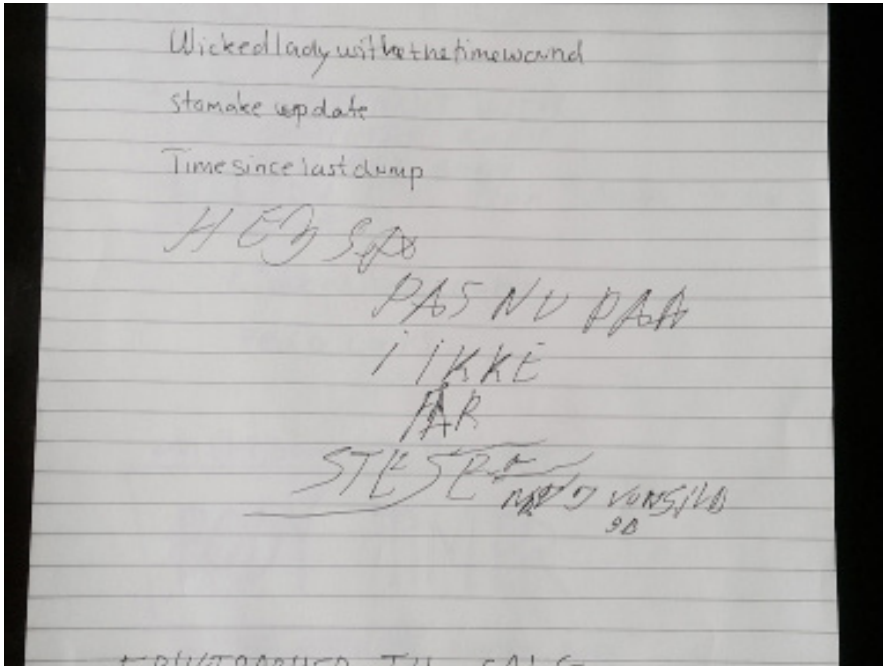


Figure 3. Notebook with Tentative Titles donated by participants for the Chronotraption “Prana”. Photo credit: Jonas Leonas.

notions of time in the field. These research artefacts fostered discussion and deliberation, aided at navigating complicated topics and helped conveying abstract ideas. More importantly, the Chronotraptions seemed to act as a invitation to explore a story world created by their audience. This was evidenced by the ingenuous and diverse titles given to the Chronotraptions and gathered in the notebooks: “Menstruation Bomb”, “Delicious Matrix”, “Biological Countdown”, “Fertility For Sale”, “Stomache Update”, “On/Off Pussy Control”, “Naughty Watch- The Sequence”. However, interesting as they might be, these titles did not tell us much about the story worlds behind them. This in turn, sparked our interest to investigate the role design can play in envisioning and navigating such story worlds.

Context as Alternative

The science fiction author Cory Doctorow illustrates design fiction as follows: “An engineer might make a prototype to give you a sense of how something works; an architect will do a fly-through to give you a sense of its spatial properties; fiction writers produce design fiction to give you a sense of how a technology might feel.” (Doctorow 2016). While we sympathise with this definition that focuses on realism and extend it to the design arena, we wanted to explore the boundaries of design fiction beyond the scientifically possible. Hence, we asked ourselves, “what would a magic realist design fiction look like?” The answer was published as a paper in a scientific conference (Encinas 2016). In it, we imagined a night where everyone shared the same dream. We illustrated the repercussion on the mainstream media with a set of photo-collages portraying grandiose headlines and speculated on the impact it could have caused on an imaginary technology lab: the Solutionist Studio. In the Solutionist Studio, prototypes that were being conceived and used as props suddenly started to work. One researcher made a “Digital Dream Catcher” to produce ambiguous images that might stimulate reflection and discussions around the shared dream. However, the paper goes on to explain that when people used it they recognised the images produced as actually belonging to the shared dream. The line that separates fiction from reality had become entirely porous.

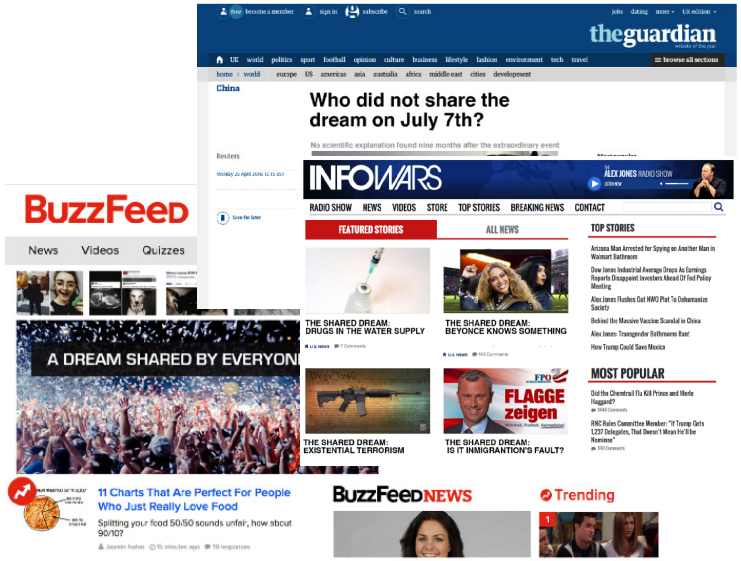


Figure 4 [Top] PhotoCollage of Mainstream Media reporting the Shared Dream. [Left] Fictional image from the shared dream produced by the Digital Dream Catcher Photo: Enrique Encinas.

The “Digital Dream Catcher” and the magic realist design fiction that surrounds it assumes a reader that “suspends disbelief”, embraces the story and undergoes a reflective process. While this seemingly straightforward progression might be accurate for prose forms of design fiction, is it the same for more graphic, or material design fictions?

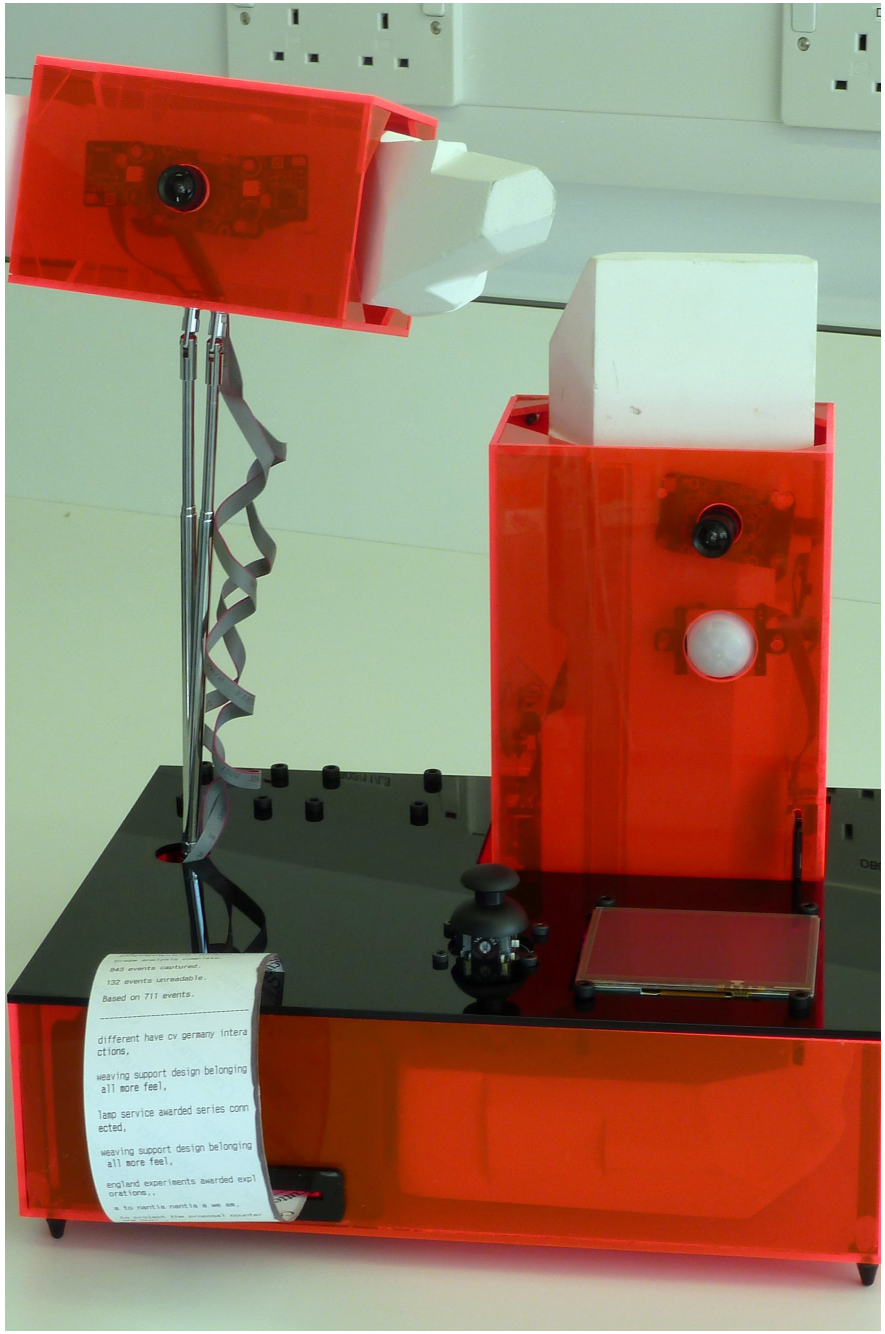
Prototype as Vehicle

Research through design makes use of purposefully designed artefacts or prototypes to explore the boundaries of knowledge, frequently involving users in various ways during different stages of the research and/or design process (Gaver 2012). In contrast to purely scientific approaches, design is generative, it assumes not a single world to be discovered but a multiplicity of worlds awaiting to be created and the theory derived from it is, in Bill Gaver's words "provisional, contingent, and aspirational" (Gaver 2012). We have chosen the Digital Dreamcatcher as the vehicle for exploring how an audience creates, understands and navigates the story world made available by a design fiction.

Originally, the Digital Dreamcatcher was a device that generated ambiguous images about a fictional dream shared by everyone. In this project, we have slightly adapted the functionality of the Dreamcatcher to foster ambiguity while keeping the content generated related to the participant. Rather than producing images about a universal dream, the Digital Dreamcatcher produces fictional poems about the person's dream.

The Digital Dreamcatcher consists of two modules. The Sleeper Module is a portable device to be placed by a bed for data capture. The Dreamer Module is a device that interprets information provided by the Sleeper and generates poetry. Both modules consist of a FEZ SPIDER mainboard

Figure 5. Sleeper module. Photo: Enrique Encinas. [Top] Sleeper module capturing data in a bedroom. [Bottom] Elements in the front and back sides of the module.



from GHI Electronics, and a set of Microsoft Gadgeteer compatible modules attached to it. On a functional level, the portable module captures images and records data of a dreamer dreaming. When a participant returns the Sleeper module to us after spending a night with it, we attach it to the base and insert the SD card into the Dreamer module. The camera is subsequently activated to capture images of the retina of the participant. When a participant looks into the viewer we see them seeing. Finally, the push of a button triggers the printing of an ambiguous, abstract and of course, fictional representation of the participants dream. We manually edit the poems before interviewing each participant and store them in the memory of the Dreamer module. The content of the poem is generated based on public information from each participant available online. In essence, an algorithm (Vajra 2016) is fed paragraphs from each participant's blogs, linked in, twitter, etc and generates poems.

Figure 6. Dreamer module with Sleeper module attached. A poem is being printed on the bottom left of the picture. On the bottom right there is a screen that displays the retina of the participant when it is located in front of the Dreamer's camera Photo: Tommy Dylan.

Process as Invitation

We are interested in studying the elements that provide for the emergence and maintenance of engagement with fictional contexts by investigating the interaction between people and design fictions. To do so we invited four participants (two male and two female PhD Design and Media Students) to interact with a purposefully designed fictional prototype: the Digital Dreamcatcher. Later, we studied their responses through qualitative analysis of recorded interactions and semi-structured interviews. We did not predefined the number of participants that would take part in our study. Rather, we invited and studied each participant independently in order to enlarge our data sample cumulatively. Once our dataset proved sufficiently extensive we decided to focus on the knowledge gathered and deepen our analysis. We intend to apply the insights from this study in a future design iteration of our prototype and invite new participants to experience it.

Each participant followed the same procedure. First, we briefed the participant regarding the overall research project. We mentioned the Digital Dreamcatcher was a design fiction and handed over the Sleeper module. We instructed the participant to position it next to the bed where dreaming takes place. If a participant asked to explain the reasons for it, we just indicated that the device would capture relevant information regarding dreaming patterns. On the next day, the participant was invited

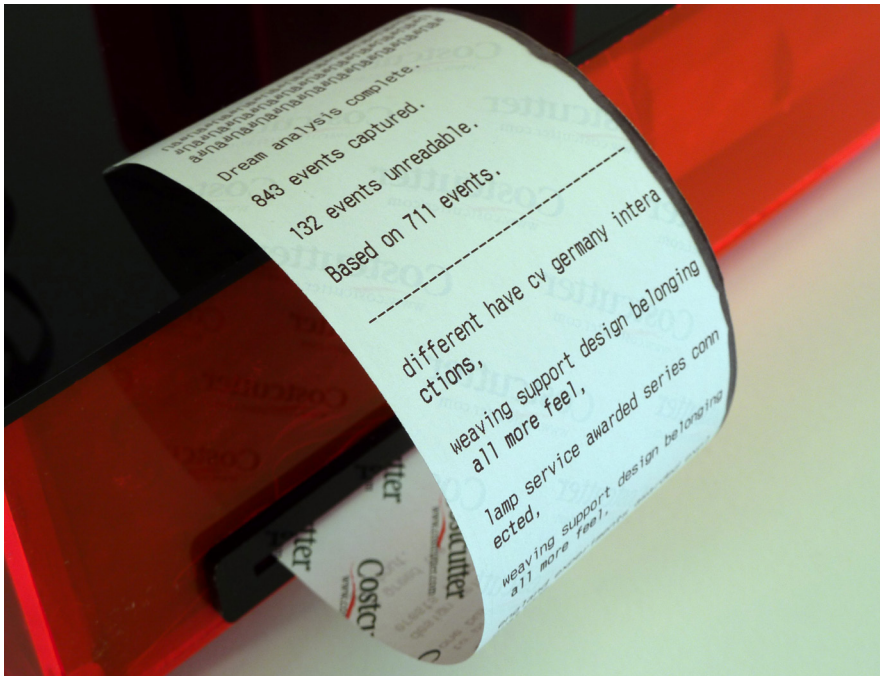


Figure 7 Close up of a poem produced by the Digital Dreamcatcher. Photo: Tommy Dylan

to take part in a semi structured interview. This interview was structured in 3 stages. During stage 1 we asked participants questions related to the previous night such as “How did sleeping next to the Sleeper module make you feel?” “Do you remember your dreams from last night?” “What do you think the device was doing?”. Stage 2 saw the assembly of Dreamer and Sleeper module, a photo of the retina of the participant, the production of the poem and a discussion on how the poem related to the participant. Questions in this stage were similar to “How is this poem related to your dream” “Why is the machine printing this?” Stage 3 comprised an explanation of the actual workings of the prototype and a discussion on the overall experience interacting with the Digital Dreamcatcher.

Outcomes as Insight

We have structured the findings in relation to the stage of the interview where they emerged. This way we can relate them to the prototype according to the task performed by participants. To preserve their anonymity we will refer to participants as [P1][P2][P3][P4].

Stage 1 - On the Sleeper module

The presence of a foreign agent (the Sleeper module) within the environment where participants slept was, at times, a cause for unease and even distress. This was best exemplified by [P1] who initially turned on the device before getting in bed but shortly after decided to turn it off. For her the main problem was the camera: “I had similar feelings to when a paralysis nightmare happens. In mine , an unknown threatening presence is watching me sleep, which in this case was the camera. So we turned it off. Sorry!”

[P3] was also affected by the working of the device. The lights glowing in the back of the Sleeper module disturbed his sleep and consequently, he decided to switch it off after two hours. However, [P2] noted that in those two hours the device certainly recorded information: “I am sure it captured something”. Also, [P2] was hesitant to act upon the device, he was “afraid to move” this “calibrated machine”. [P4] also mentioned a hypothesis regarding the behaviour of the device. He thought it might be

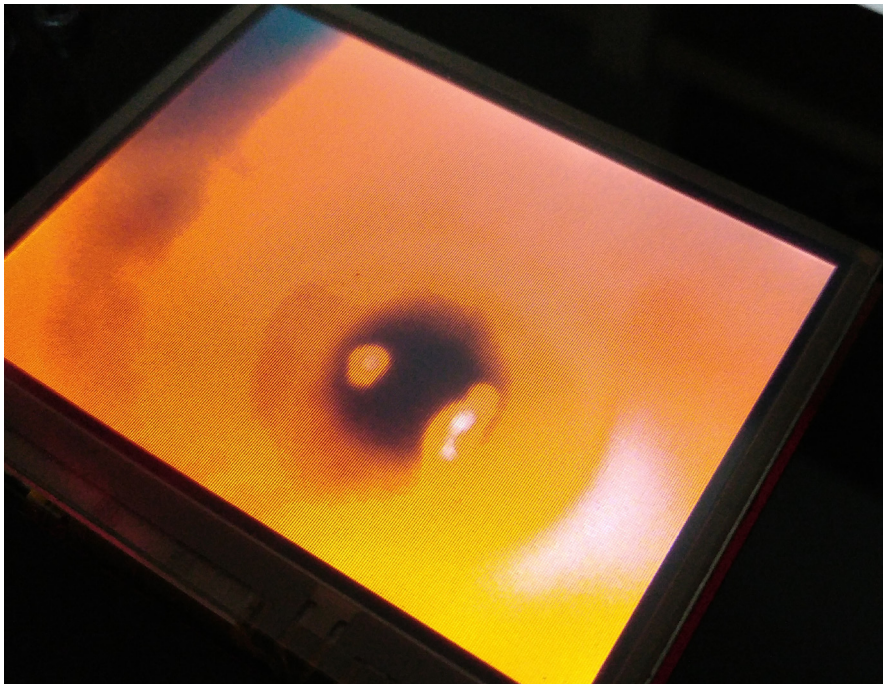


Figure 8 Close up image of the retina of a participant as shown by the Digital Dreamcatcher. Photo:Tommy Dylan.

capturing sound and temperature, the latter because it “influences the quality of sleep”.

The Sleeper also served as a platform to discuss dreams and dreaming. During this part of the interview, all participants shared dreams from the past. [P2] recalled a vivid nightmare happening the night the Sleeper module was present. [P3] explained how she is able to modify the narrative trajectory within her dream so it does not turn into a nightmare.

Speculating about the Sleeper module went a step further in the case of [P3]. She usually has vivid dreams and was utterly surprised when she woke up and was unable to recall any. According to her, the Sleeper

module might be the cause of such outcome: “Maybe because I knew this was gonna sort of capture what I dreamt, I sort of store it there instead of knowing when I woke up”. This seemed to her a desirable design feature: “If I had nightmares and I knew they would be stored there, I wouldn’t have to wake up tired”.

Stage 2 - On the Dreamer module and the poems

This stage of the interview comprises the responses of participants to the poems printed by the Dreamer module. Essentially, participants were asked to look directly into the camera and press a button. The device printed a poem that participants read aloud. After this, we asked questions like “how is this poem related to your dreaming process?” and “What does this message mean to you”? For each participant we repeated this process three times, producing and discussing three poems.

Some participants reacted with a mix of surprise and curiosity to the poems. [P3] for example, exclaimed “Wow! I’ve been thinking about what I’ve done before and how can I use it here” (by “here” she refers to where is currently studying). She seemed puzzled to discover the connection between herself and the words printed: “This is really weird, because it is sort of what is going on in my life at the moment”. An explanation to such statement followed: “my dreams are usually about what I’ve done in my day”. The reaction of [P3] after reading the second poem aloud was that of perplexity: “This is freaking me out.” When asked why, she replied: “because I know it cannot read my dreams but it feels like it can read my dreams.” We wondered if seeing this poem was making her feel uncomfortable. We received a positive answer: “maybe because I have dreams that only make sense to me, dreams are so personal…”

The way participants engaged with the content of the poems seemed to follow an approach based on particular meanings rather than in full sentences or the overall poem. [P4] reacted to single, meaningful words. Nopal, for example, reminded him of a dear food back home and triggered comments on the lack of joy consuming food in [Anon]. He felt this word to be a suitable part of his dreams along with, for example, “The Nordics” because both are salient in his everyday. [P4] had been watching the TV show “Vikings” about a nordic civilisation. While some terms were ignored, other words provoked reflection and required second thoughts. [P3] was meditative after reading “blistering winds”, words that reminded her of daydreaming and how the Dreamcatcher might be also recording dreams while she is awake. Finally [P4] wondered why the word “windows” appeared in many of the poems.

We asked our participants about their thoughts on what dreams are to make better sense of the interpretive key they used to talk about their dream. Interestingly, the manner in which the content of the poems was explained closely related the theoretical concept of dream the participant had. [P3] saw dreams as a mechanism of storage or disposal of everyday events. At the same time, the words that she felt more relevant were

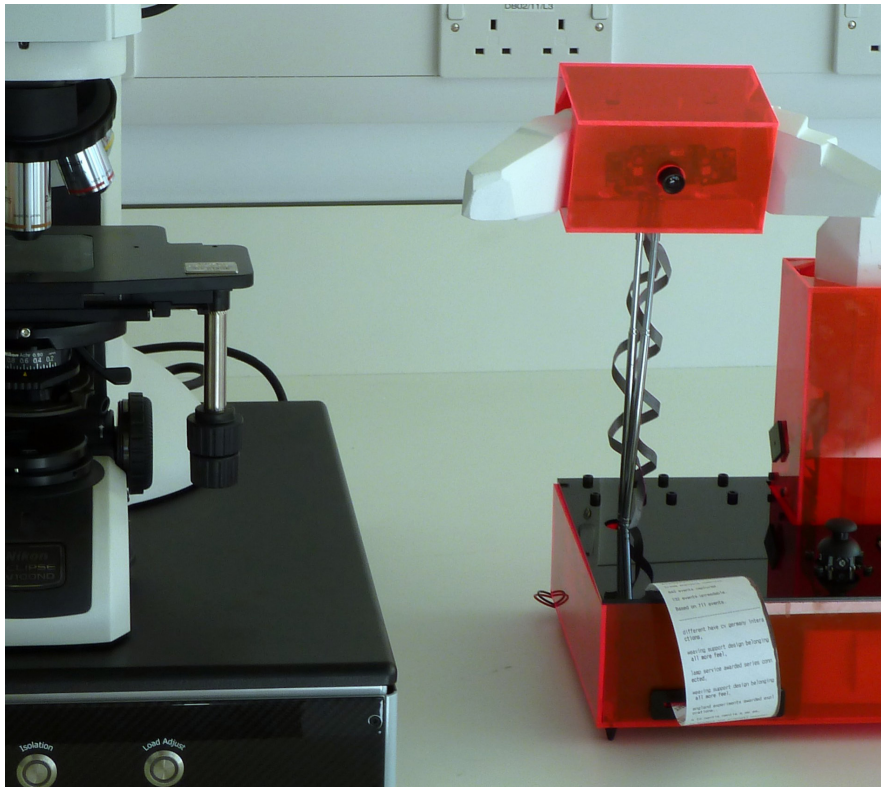


Figure 9 The Digital Dreamcatcher next to an optical microscope. Photo: Tommy Dylan.

those close to her everyday experience. Similarly, [P4] explained dreams as a process of exposure of hidden desires, sometimes responding to bodily reactions. Subsequently, the appearance of the name of a food in the poem was for him notable in this regard.

Interestingly, [P2] responded in a very different manner to the poems. Immediately after reading the first verses, he realized how we have constructed the poem and when facing the question “what does this mean to you?” his answer was: “Random bits from my linkedIn profile”. Our invitation to “tag along” with our fiction had failed. However, his comments afterwards proved invaluable in understanding why. They also provided rich insight into design for fictional contexts. For [P2] the artefact was “maybe too believable”, mainly due to the components employed in its construction: camera, LEDs, etc. Also, for [P2] there was “too much truth” in our setup and reminded us of the work of Ann Light (Light) where a mere glove served to create and navigate a fictional world.

Stage 3 - On the overall experience

In this final stage of our interview we asked participants how they thought the poems were produced and what were their impressions on the overall experiment. Participants [P3] and [P4] both deduced that the poems were related to information available online and referred to “pre-captured data” or “algorithms that search online”. At the same time, both participants reflected on the implications of publishing information online and how it is consumed. For [P4] the Dreamcatcher might help raising awareness regarding the information one is consuming and how it might influence one’s ability to dream.

A lot of design possibilities were also discussed. [P2] suggested that the Dreamcatcher should be “refictionalized” to facilitate unusual interactions that would elicit the fantastic. He suggested employing magnetism or light in abstract ways. [P3], however, imagined the Dreamcatcher in the context of the home. Maybe as a toaster, or coffee maker, that produces a testimony of dreams while one gets a grip on the day to come.

Design Fiction as Autopoietic System

A closer look into the responses from participants to the Digital Dreamcatcher has allowed us to approach design fiction from a different perspective. Rather than considering a design fiction as an object or the story surrounding an artefact, we argue that a design fiction is a system. A system that encompasses not only artefact and story, but participants and researchers too.

Design Fiction as System

Undoubtedly, at the core of a design fiction is a designed artefact (story, illustration or prototype) that embodies the ideas of a designer and certainly, sets the stage for the story world where the design fiction exists. In our case, this artefact is the Digital Dreamcatcher. However restricting the identity of the design fiction to the artefact or the intentions of the designer in constructing the story that accompanies it would be, following our results, to assume too much. For [P3] the story surrounding the Digital Dreamcatcher involves memories of her past, surprising technological affordances and reasons for personal experience. For [P2], in turn, the story is reduced to his LinkedIn profile. The space of knowledge that a design fiction occupies varies depending on how a participant embraces the artefacts designed. Researchers facilitating the interaction between participants and artefacts play an important role here. Undoubtedly,

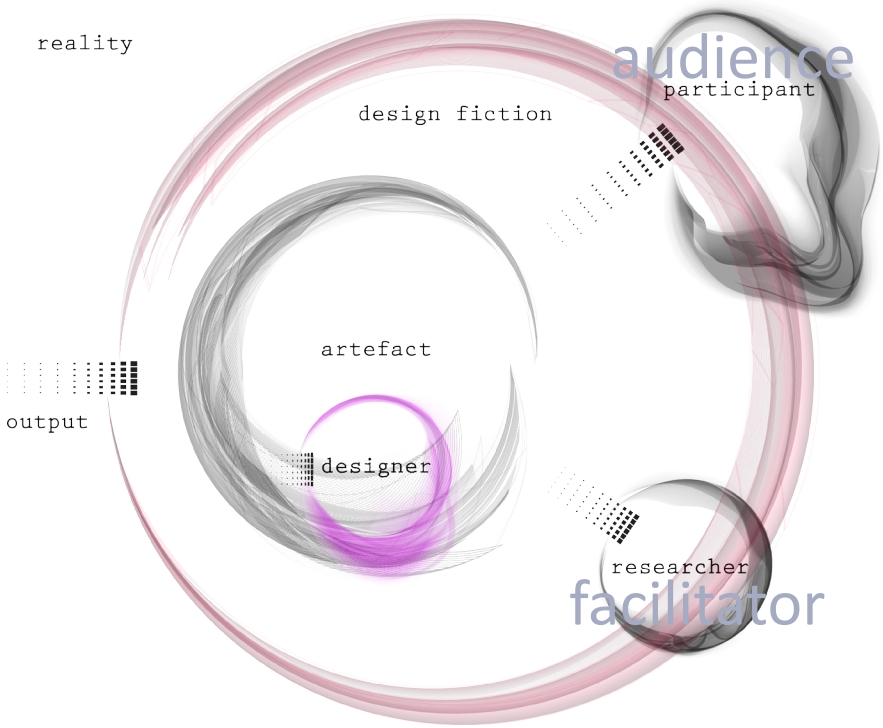


Figure 10 Diagram of design fiction as system Photo:Enrique Encinas.

how we tailored the questions and conducted the interviews also had an impact on participants' involvement. For example, asking participants what dreams are after they had read a poem provided them with a dialectic space where to correlate familiar words with an overall understanding of dreaming.

As we aim to show with Figure 10, we see design fiction as a system with a flexible boundary defined by the interaction between artefact (and implicitly, the designer), participant (audience) and researcher (facilitator). The dotted lines in the image illustrate the information flows between each structure. This flows "inflate" or "deflate" the boundary of the design

fiction, extending or constraining its range of influence (in the diagram, the red boundary). Furthermore, the three way interaction between artefact, audience and facilitator influences the outcomes (in the form of knowledge) the design fiction produces. We can find a number of examples of this effect throughout our data: In the interaction with [P4], we discussed information production and consumption and how that relates to health and wellbeing. [P3] elaborated on how a technological device like the Digital Dreamcatcher might disrupt privacy and the sense of ownership we have concerning our dreams. With [P2] we explored design possibilities and opportunities for future design fictions. None of this instances were aspects initially encoded within the design fiction but rather emerged locally in the interaction between the elements of the design fiction system: audience, artefact and facilitators.

"Suspension of disbelief" occurs in autopoietic design fictions

Design Fiction is frequently defined as "the use of diegetic prototypes to suspend disbelief about change". While we acknowledge the value of this definition, we argue that "suspension of disbelief" is not an automatic response to design fiction. As our participants showed, exposure to a design fiction does not imply suspension of disbelief on the part of the audience. [P3] and [P4] were able to "go along" with the fiction, hence suspending their disbelief. However, [P2] did not do so after discovering how the Digital Dreamcatcher was producing dreams. We offer a possible reason for this effect, one that is based on the concept of autopoiesis.

The Chilean biologists Jose Maturana and Francisco Varela [] coined the term autopoiesis to describe systems that continuously generate and specify its own organisation. The term was initially applied to living organisms, like biological cells, that produce the parts or elements they are made of. By contrast, a system is allopoietic if it cannot maintain a system of production of its own components. For example, a bakery is an allopoietic system because it produces bread but it does not produce workers, ovens or bricks. In essence, autopoiesis is a system's ability to create and maintain itself.

If we were to view design fiction as a system, what would entail to define it as autopoietic? Following the definition by maturana and Varela, the design fiction should be able to generate the elements from which it is made. As we specified in the previous section, these elements can be of various nature and certainly, quite unlikely to be generated by a design fiction in the manner that a biological autopoietic system generates its elements (a design fiction would hardly generate its audience in the same way a cell its mythocondrias). However, a design fiction can integrate the elements it is made of by assimilation within its own story world. An autopoietic design fiction reach audiences, gains facilitators or enlist artefacts. It stories are kept alive through a willful suspension of disbelief.

We believe that the design fiction emcompassing the Digital

Dreamcatcher, [P3] (and similarly [P4]) and us as researchers might have at times behaved as an autopoietic system and as a consequence, participants were able to "suspend their disbelief". This design fiction was able to expand and maintain itself. With [P3] for example, the design fiction was extended by speculating on the Digital Dreamcatcher interpreting, not only night dreams, but daydreaming too. Likewise, [P4] "created" the fiction by grounding it on the possibility of a Digital Dreamcatcher that was able to listen to him speaking in dreams.On the other hand, in the case of [P2] the design fiction was allopoietic, its story collapsing into a conversation about design features of the physical artefact rather than assimilating new elements.

Conclusion as RTD2017

This preliminary characterisation of Design Fiction as a system with autopoietic or allopoietic characteristics has originated a number of interesting questions that deserve further study. Are there any other relevant elements influencing the design fiction system? How are the particular interactions between elements within the system characterised? How does a design fiction system interact with reality or an audience without a researcher? and more importantly, what makes a design fiction autopoietic?

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